

UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SAMSUNG ELECTRONICS CO., LTD.,  
Petitioner,

v.

TELEFONAKTIEBOLAGET LM ERICSSON,  
Patent Owner

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**U.S. PATENT NO. 10,517,133**

Case IPR2021-TBD

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**DECLARATION OF FRIEDHELM RODERMUND**  
**IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S.**  
**PATENT NO. 10,517,133**

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I, Friedhelm Rodermund, do hereby declare as follows:

**I. INTRODUCTION AND ENGAGEMENT**

1. I have been retained in this matter by Samsung Electronics Co., Ltd (“Petitioner” or “Samsung”) to provide testimony regarding 3GPP’s standard business practices for record keeping and publishing technical specifications, change request proposals, reports, and other documents developed during the course of standards activities carried out by the 3rd Generation Partnership Project (“3GPP”) and the European Telecommunications Standards Institute (“ETSI”).

2. I have been asked to provide my opinions regarding the authenticity and dates of public accessibility of the following 3GPP documents:

- T-doc R2-1710279, which represents a document with the title “RRC connection re-establishment and resume procedures in NR” (hereinafter “R2-1710279”, Ex. 1007)
- T-doc R2-1714208, which represents a document with the title “OFFLINE#22 LTE re-establishment and resume while using NR PDCP” (hereinafter “R2-1714208”, Ex. 1004)

3. As an ETSI Project Manager and Secretary, from June 1998 to December 2004, I have personal knowledge of 3GPP’s standard business and records keeping practices. I continued following 3GPP’s work ever since. Thus, based on my experience, personal knowledge, and review of 3GPP’s business

records, I am able to testify regarding the authenticity of certain documents published by 3GPP and the timing of their publication.

4. I am being compensated for my time spent on this matter at my usual rate of €450 per hour. My fee is not contingent on the outcome of this or any matter, or on the content of any of the testimony I give in this declaration. I have no financial interest in Petitioner.

5. I have been informed that Ericsson (hereinafter referred to as “Patent Owner”) alleges ownership and is the current assignee of U.S. Patent No. 10,517,133 (“the ’133 Patent”) (Ex. 1001). I have no financial interest in the Patent Owner or the ’133 patent.

## II. **BACKGROUND AND QUALIFICATIONS**

6. I have more than 20 years of experience working with standards development organizations including the Third Generation Partnership Project (“3GPP”), the European Telecommunications Standards Institute (“ETSI”), and the Open Mobile Alliance (“OMA”). I have particular experience with the development of standards related to cellular telecommunications, including the standards for the Universal Mobile Telecommunications System (“UMTS”), Long Term Evolution (“LTE”), and 5G, which are all standards developed by the 3GPP. A true and correct copy of my curriculum vitae (C.V.) is attached as Appendix A.

7. I attended the University of Technology Aachen in Aachen, Germany, where I performed graduate studies in Electrical Engineering with a focus on telecommunications technologies (“Dipl.-Ing. TH” degree). I also attended the University of Technology Trondheim in Trondheim, Norway, and completed my Diploma thesis, “Design of a dual processor computer for digital signal processing in power electronics,” in 1993.

8. From December 1993 to June 1998, I worked at Mannesmann Mobilfunk as a System Engineer and Project Manager in Quality Assurance and Technical Standards. One of my responsibilities was to ensure by managing and performing related test activities that cellular network equipment was compatible with the Global System for Mobile Communications (“GSM”) standard developed by ETSI. During that time, I also started working as a standards delegate. I attended my first ETSI meeting in 1996 (although I was already following ETSI developments from 1992 during my studies).

9. From June 1998 to December 2004, I worked at ETSI as a project manager for various ETSI Special Mobile Group (“SMG”) and 3GPP working groups. First, I served as a secretary of SMG4 “Data Services” and SMG8 “Base Stations Testing.” Then, as a project manager with the ETSI Mobile Competence Center (“MCC”), I supported establishing 3GPP as the new international standards development organization for cellular telecommunications. One of my roles was

acting as Secretary for 3GPP's Technical Specifications Group Terminals, Working Group ("T2"), the group which played a leading role in the creation of standards for Multimedia such as the Multimedia Messaging Service ("MMS").

10. Later, I was a secretary of the highest-level Technical Specifications Group Terminals which was besides other things responsible for the development of test specifications including tests for the radio interface.

11. I edited all technical specifications produced by my working groups and presented results to the parent body for approval. I attended all meetings (apart from some sub-working group meetings) and was also responsible for compiling meeting reports, for handling all the meeting documents, and managing the work plan. It was also my role to guide the groups and to advise the chairmen regarding 3GPP working methods and procedures including document handling, and to make sure delegates were aware of their company's obligations under the 3GPP Intellectual Property Right policy.

12. As part of my responsibilities at ETSI, I acted as a 3GPP custodian of records by personally managing 3GPP's public File Transfer Protocol (ftp) folders, which I used to make publicly accessible various 3GPP documents, including versions of 3GPP specifications, technical reports, liaison statements, change requests, contributions, agendas, meeting reports, and other 3GPP documents from my working groups. I am also knowledgeable about document management

practices used in other working groups and within 3GPP in general with regard to making documents publicly accessible through the same, public ftp server of 3GPP.

13. Since I left ETSI as a staff member in 2005, I have been continuously involved in standardization activities, including with Open Mobile Alliance, ETSI, and 3GPP. Since 2017, I also have been attending the ETSI Intellectual Property Rights (IPR) Special Committee, which is responsible for the maintenance of the ETSI IPR Policy.

14. After I left ETSI, I worked from January 2005 to October 2014 at Vodafone, first as a Project Manager for Mobile Broadcast Standards, and then as Vice Chairman of the Device Management working group of the Open Mobile Alliance, and then as a Senior Standards Strategist, all with responsibilities as described on my C.V. At Vodafone, I was deeply involved in standards work with ETSI and 3GPP and other standards setting organizations, including as a delegate to 3GPP SA1 “Services.” As part of my responsibilities, I attended selected 3GPP meetings, submitted documents to 3GPP, used 3GPP resources (including 3GPP’s ftp server) extensively, and remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility. I was also involved in the creation of patents, defense activities related to patent litigations, and patent evaluation, mostly in the context of standards development.

15. Since leaving Vodafone in 2014, I have performed consulting work regarding Internet of Things (IoT) and Machine to Machine (M2M) technology and standards, first at Friedhelm Rodermund Consulting and then as the Founder and Director of IOTECC GmbH. In connection with my work, I regularly deal with standards such as OMA's Lightweight M2M, 3GPP's LTE, Narrowband IoT (NB-IoT) and 5G standards. And I have extensively used 3GPP resources and have remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility.

16. I also provide consulting services related to patents, in particular around 3GPP Standard Essential Patents ("SEPs"), and I have been working as an expert witness on a number of occasions. I continue to closely follow the maintenance of the ETSI IPR Policy as a delegate to the ETSI IPR Special Committee. Furthermore, I am conducting a seminar on SEPs and the Internet of Things at the Technical University of Ilmenau, Germany.

17. At the time of writing this declaration, I am following – including attending selected meetings - the following standards committees: ETSI oneM2M, ETSI IPR Special Committee, Open Mobile Alliance, and 3GPP.

18. A copy of my curriculum vitae, which includes a detailed description of my experience and education, is attached as Appendix A. A list of litigation



matters on which I have worked over the last five years is also included in my curriculum vitae.

### **III. SUMMARY OF MY OPINIONS**

19. It is my opinion that R2-1710279 (Ex. 1007) is an authentic 3GPP T-doc and would have been publicly accessible through ftp.3gpp.org no later than September 29, 2017.

20. It is my opinion that R2-1714208 (Ex. 1004) is an authentic 3GPP T-doc and would have been publicly accessible through ftp.3gpp.org no later than December 2, 2017.

### **IV. PUBLICATION OF 3GPP SPECIFICATIONS AND RELATED DOCUMENTS**

#### **A. General Practices**

21. Unless otherwise noted, the following is an accurate description of 3GPP general practices from 1998 to the present, regardless of whether I use the present or past tense to describe those practices.

22. 3GPP was established in 1998 by a group of telecommunications standard development organizations from Japan, Korea, China, Europe, and the United States to jointly develop worldwide standards for mobile telecommunications. Today, 3GPP consists of seven partners: Association of Radio Industries and Businesses, Japan (“ARIB”), Alliance for Telecommunications Industry Solutions, USA (“ATIS”), China Communications Standards Association

(“CCSA”), European Telecommunications Standards Institute (“ETSI”), Telecommunications Technology Association, Korea (“TTA”), Telecommunication Technology Committee, Japan (“TTC”). In addition to being one of the founding partners, ETSI hosts the Mobile Competence Centre (“MCC”), which provides administrative and technical support to the day-to-day work of 3GPP. Furthermore, ETSI manages 3GPP’s IT services such as the 3GPP website, ftp server, and email exploders.

23. 3GPP is the world’s leading organization for developing and maintaining cellular telecommunications standards, which it has done since its foundation in 1998. As noted above and in my C.V., I began working for 3GPP, as part of my work at ETSI, the European-based organizational partner of 3GPP.

24. In the ordinary course of its regularly conducted business activities, and pursuant to its standard business practices, 3GPP publishes technical specifications, proposals, reports, and other documents related to the development of cellular telecommunications standards. Such documents are published for the purposes of discussion and establishment of industry standards for cellular telecommunications. This has been 3GPP’s ordinary course of business since when I began working at ETSI in 1998.

25. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, all draft technical

specifications, proposals, reports, and other temporary documents to be discussed or considered in relation to 3GPP's telecommunications standards activities were, and continue to be, assigned a temporary document number and made publicly available, including on the ftp server associated with the 3GPP website, currently residing at ftp.3gpp.org. Such documents are referred to as "T-docs." Final versions of the technical specifications also were, and continue to be, publicly available from that same ftp server.

26. The names and the structure of 3GPP working groups can be found below<sup>1</sup>:

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<sup>1</sup> See <https://www.3gpp.org/specifications-groups>

<b>Project Co-ordination Group (PCG)</b>		
<b>TSG RAN</b> Radio Access Network	<b>TSG SA</b> Service & System Aspects	<b>TSG CT</b> Core Network & Terminals
<b>RAN WG1</b> Radio Layer 1 spec	<b>SA WG1</b> Services	<b>CT WG1</b> User Equipment to Core Network protocols
<b>RAN WG2</b> Radio Layer 2 spec Radio Layer 3 RR spec	<b>SA WG2</b> Architecture	<b>CT WG3</b> Interworking with external networks
<b>RAN WG3</b> lub spec, lur spec, lu spec UTRAN O&M requirements	<b>SA WG3</b> Security  SA3-LI SA3 subgroup on Lawful Interception	<b>CT WG4</b> Core Network Protocols
<b>RAN WG4</b> Radio Performance Protocol aspects	<b>SA WG4</b> CODECs	<b>CT WG6</b> Smart Card Application Aspects
<b>RAN WG5</b> Mobile Terminal Conformance Testing	<b>SA WG5</b> Telecom Management	
	<b>SA WG6</b> Mission-critical applications	

27. Each Technical Specification Group (TSG) or Working Group adopts a structured numbering system for the documents associated with their meetings, and those systems typically follow a consistent numbering system as shown in the following example: xminnzzzz. The numbering system normally comprises five logical elements: (1) x: a single letter corresponding to the TSG; where in 2007/2008 x was one of R (Radio Access Network), C (Core and Terminals), S (Service and System Aspects), or G (GSM/EDGE Radio Access Network); (2) m:

A single character corresponding to the Working Group identity (typically 1, 2, 3, etc.) or, in the case of the TSG itself, the letter “P”; (3) i: Normally the hyphen character “-”; (4) nn: the calendar year of the meeting to which the document was submitted; (5) zzzz: a running number (some Working Groups use 5 digits).

28. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, from December 1998 onwards, 3GPP published all of its T-docs and all final versions of its technical specifications on its ftp server, which has always been easily and publicly accessible from its website and currently resides at [ftp.3gpp.org](ftp://ftp.3gpp.org).

29. As early as December 1998, 3GPP’s ftp server was freely accessible to the general public with no login, password, or membership requirement.

30. By 1999, at least 100 companies were members of 3GPP (by December 2020: 719 companies), ranging from Bosch to Ericsson to Nokia to Samsung and generally including those interested in the discussion, creation, and adoption of cellular telecommunications standards, including UMTS. Each of these companies typically delegated multiple individuals to regularly participate in 3GPP meetings. Further, pursuant to 3GPP’s standard business practices, 3GPP working groups sent emails notifying these individuals as soon as new or additional documents had been uploaded to 3GPP’s ftp server. Thus, not only did the general public have access to the documents on the ftp server, but some of the most

interested members of the public—those working to develop standards for cellular telecommunication or working to implement the standards—were personally informed of their availability by email. Based on my experience with 3GPP and the telecommunications industry, I would expect any person implementing a cellular network or device, e.g., an 5G network or device, to consult the corresponding specifications on the 3GPP ftp server, as well as other related documents. The whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.

31. 3GPP specifications bear a specification number consisting of four or five digits, e.g., 09.02 or 29.002. The first two digits define the specification series which are defined to group the different aspects of the 3GPP system into e.g. requirements, service aspects, radio aspects codecs, security aspects, and test specifications. The series digits are followed by two additional digits for the 01 to 13 series or three further digits for the 21 to 55 series. The subjects of the individual specification series are explained on 3GPP's website at <https://www.3gpp.org/specifications/specification-numbering>, and reproduced below:

Subject of specification series	3G and beyond / GSM (R99 and later)	GSM only (Rel-4 and later)	GSM only (before Rel-4)
General information (long defunct)			00 series
Requirements	21 series	41 series	01 series
Service aspects ("stage 1")	22 series	42 series	02 series
Technical realization ("stage 2")	23 series	43 series	03 series
Signalling protocols ("stage 3") - user equipment to network	24 series	44 series	04 series
Radio aspects	25 series	45 series	05 series
CODECs	26 series	46 series	06 series
Data	27 series	47 series (none exists)	07 series
Signalling protocols ("stage 3") -(RSS-CN) and OAM&P and Charging (overflow from 32.- range)	28 series	48 series	08 series
Signalling protocols ("stage 3") - intra-fixed-network	29 series	49 series	09 series
Programme management	30 series	50 series	10 series
Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.	31 series	51 series	11 series
OAM&P and Charging	32 series	52 series	12 series
Access requirements and test specifications		13 series (1)	13 series (1)
Security aspects	33 series	(2)	(2)
UE and (U)SIM test specifications	34 series	(2)	11 series
Security algorithms (3)	35 series	55 series	(4)
LTE (Evolved UTRA), LTE-Advanced, LTE-Advanced Pro radio technology	36 series	-	-
Multiple radio access technology aspects	37 series	-	-
Radio technology beyond LTE	38 series	-	-

32. For instance, the LTE radio standard is covered in the “36 series” and is further subdivided into separate sections or specifications. The LTE radio specification series starts at TS 36.101 and ends at TR 36.978. Excluding withdrawn specifications, the LTE standard consists of more than 250 specifications. Each specification can span from a few pages to hundreds of pages. One full version of

the LTE standard is massive, spanning tens of thousands of pages. Another example is the “New Radio” (5G NR) standard which is covered in the “38 series”.

33. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, T-docs are usually uploaded to 3GPP’s ftp server and website before the meeting where they are to be discussed. Documents created or revised during the course of a meeting are normally uploaded at the latest during the week following the meeting (e.g., the meeting report of the meeting is usually published for review during the week following the meeting).

34. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, 3GPP maintains archives that include different versions of the specifications, as well as email communications to its membership, including emails announcing the uploading of new or additional documents to 3GPP’s ftp server. These archives are created at the time the emails are initially sent.

35. At least as early as July 1999, all of 3GPP’s email archives, including the dedicated email list for TSG RAN WG1 and TSG RAN WG2 were freely accessible to the general public with no login, password, or membership requirement. Each of 3GPP’s member companies typically assigned one or more individuals to regularly participate in these email lists. Thus, not only did the



general public have access to the emails in 3GPP's email archives, but some of the most interested members of the public—those working to develop standards for cellular telecommunication—personally received copies of such emails through their participation in the email lists.

36. By June 1999, 3GPP's email archives were well-known to persons in the cellular telecommunications industry as a source of public information and of technical specifications, proposals, meeting announcements, technical discussions and reports regarding industry standards and technological advances.

37. Based on my experience with 3GPP and the telecommunications industry, I would expect a person interested in the development of cellular standards, e.g., UMTS, to consult the emails archives of the working groups and TSGs that person is interested in, and/or, to be subscribed to the corresponding email reflectors to receive any email notifications in real-time.

38. 3GPP specifications almost always are duplicated in at least two and sometime more locations on the ftp server. One location corresponds to a “snapshot” of the specifications corresponding to a particular plenary meeting cycle, e.g., the 2018-12 snapshot contains a snapshot of numerous specifications after the December 2018 3GPP plenary meetings. The second location is an “archive” that contains all versions over time for a given specification. While 3GPP aims to upload the updated specifications to both locations at the same time,

occasionally there may be a small difference in the upload date, and thus the date stamp, for the same specification uploaded to the two locations. Additionally, specifications which are not yet approved (so call “draft” specifications) are available as T-docs at working group and at plenary meetings (as soon the working group decides to submit the specification to the plenary meeting for information or approval).

39. The timestamp on 3GPP’s ftp server shows the date when the document was uploaded the last time. Thus, the timestamp shows the latest possible date the document became publicly available and accessible on 3GPP’s ftp server. The given document might have been available earlier and the original timestamp might have been overwritten because the document was uploaded again. According to my experience, this is something which happened quite frequently. Thus, the ftp timestamp is reliable as the latest possible upload date but one cannot determine whether it represents the first upload of a document to the ftp server.

40. 3GPP’s working practice to store their documents on their ftp server, as described above, has not changed over time. Starting from the first 3GPP meetings in 1998 until present, all WGs and plenary meetings are represented by dedicated meeting folders on the ftp server. These meeting folders include the documents discussed at the meetings. Both the folders and the documents are accessible to the public. Almost every week, a new meeting folder with the

respective documents is added. In addition to the plenary and WG meeting folders, and some other folders, there is also the “Specs” folder, which holds all 3GPP specifications including the aforementioned “snapshot” and archive folders. Since the early days of 3GPP a new folder is added inside the “Specs” folder after each TSG plenary meeting to hold the latest versions of specifications approved at those TSG plenary meetings. This is still 3GPP’s working practice today; thus, this practice has not changed over time.

**B. Specific Documents**

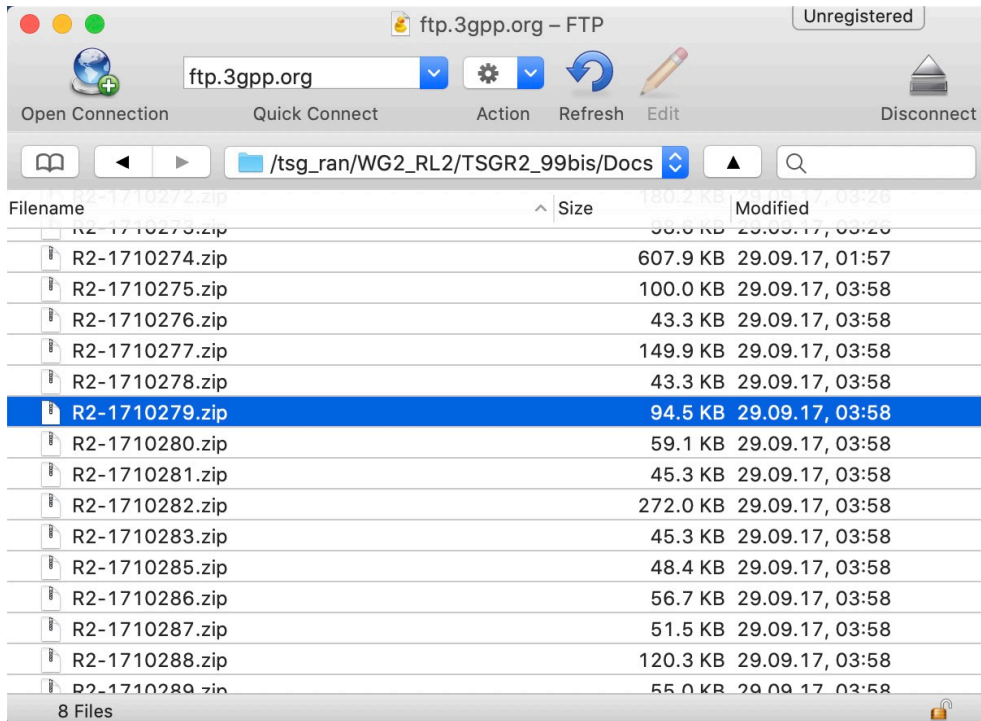
**1. R2-1710279**

Based on my personal knowledge and my review of 3GPP’s business records, I recognize Ex. 1007 as a true and correct copy of T-doc R2-1710279, which represents a document submitted by CATT with the title “RRC connection re-establishment and resume procedures in NR.” The document discusses details of the procedures for RRC connection re-establishment and RRC connection resume. On its face, R2-1710279 refers to the RAN WG2 meeting #99bis held on October 9-13, 2017 in Prague, Czech Republic. Thus, based on my personal knowledge and experience with ETSI’s and 3GPP’s standard business practices, this information tells me that R2-1710279 was available either prior or during that meeting to at least all attending 3GPP members. The latest availability of the document is confirmed by the date stamp, September 29, 2017, shown on the historic 3GPP ftp

server for the corresponding downloadable file (“R2-1710279.zip”), as maintained by the Internet Archive at

[https://web.archive.org/web/20171118220418/http://www.3gpp.org/ftp/tsg\\_ran/WG2\\_RL2/TSGR2\\_99bis/Docs](https://web.archive.org/web/20171118220418/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_99bis/Docs) as well as the date stamp for the present-day listing of the same document on the 3GPP ftp server

[https://www.3gpp.org/ftp/tsg\\_ran/WG2\\_RL2/TSGR2\\_99bis/Docs](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_99bis/Docs) as can be seen at the screen shot below:



41. In addition, the information for the downloaded and extracted T-doc file states a last Modified date of “29. Sep 2017.” Here is a screenshot showing those file details:

3GPP TSG-RAN WG2 #99bis  
Prague, Czech Republic, 9 - 13 Oct 2017  
170796

R2-1710279  
Revision of R2-170796

Source: CATF  
Title: RRC connection re-establishment and resume procedures in NR  
Agenda Item: 10.4.1.3.4  
Document for: Discussion and Decision

**1. Introduction**  
In RAN2#97 this meeting, some guidelines are agreed for the RRC messages and procedures [1].

Agreement  
1. Aim to limit the number of RRC messages i.e. avoid introducing several messages with similar content/ similar procedural handling (details can be discussed when more progress has been made on the individual procedures)  
This contribution discusses the details of individual procedures for RRC connection re-establishment and resume.

**2. Discussion**  
**2.1. RRC connection re-establishment**  
In LTE, the purpose of this procedure is to re-establish the RRC connection, which involves the resumption of SRB1 operation, the re-activation of security and the configuration of only the PC5.

**Figure 1 RRC connection re-establishment, successful**

**Figure 2 RRC connection re-establishment, failure**

The function of re-establishing the RRC connection should naturally be supported in NR for UE in connected mode, including the successful and failure procedures.

**Proposal 1: Support the successful and failure procedures for RRC connection re-establishment in NR.**  
The content of the RRC messages for RRC connection re-establishment are listed in the table 1.

**Table 1 content of the RRC messages for RRC connection re-establishment**

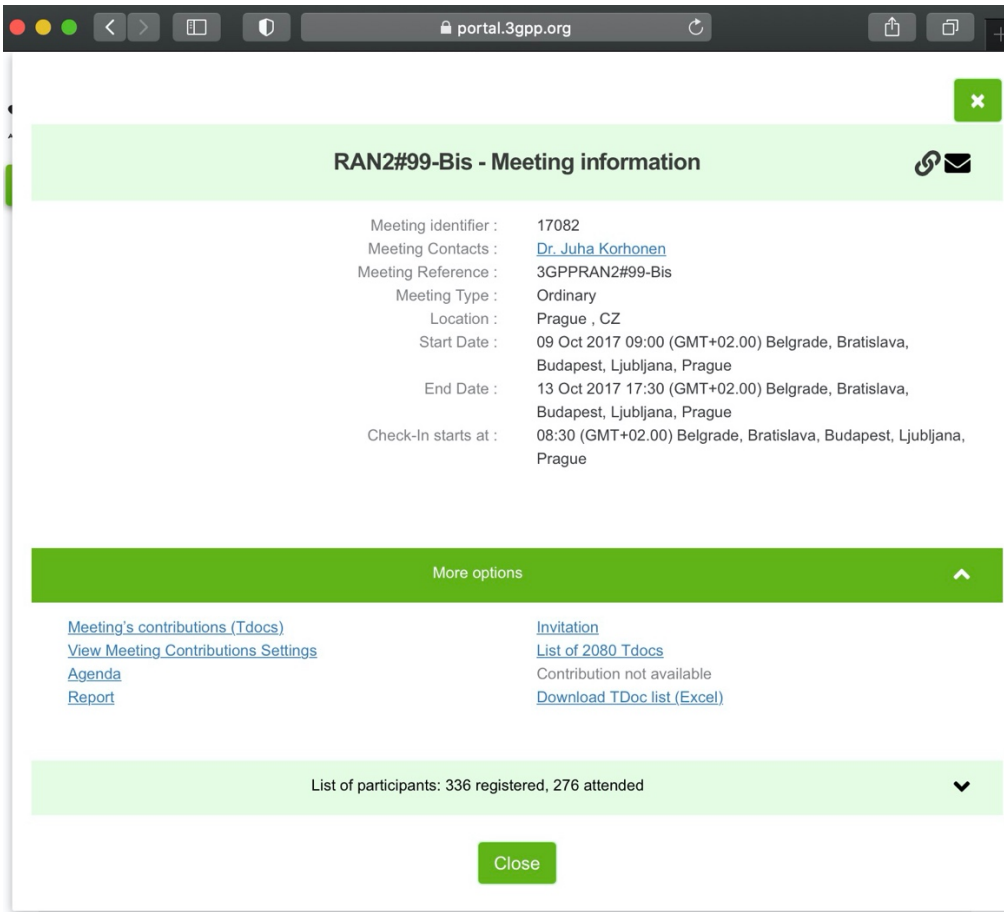
RRC message	Content in LTE	Proposed Content in NR
RRCConnectionReestablishmentRequest	<ul style="list-style-type: none"> <li>reestablishmentCause</li> </ul>	<ul style="list-style-type: none"> <li>reestablishmentCause</li> </ul>
RRCConnectionReestablishment	<ul style="list-style-type: none"> <li>reestablishmentCause</li> <li>radioResourceConfigDedicated (for SRB1)</li> <li>nextHopChainingCount</li> </ul>	<ul style="list-style-type: none"> <li>reestablishmentCause</li> <li>radioResourceConfigDedicated (for SRB1)</li> <li>nextHopChainingCount</li> </ul>
RRCConnectionReestablishmentComplete	<ul style="list-style-type: none"> <li>reestablishmentCause</li> <li>logMeasAvailable-r10</li> <li>connEstFailInfoAvailable</li> </ul>	<ul style="list-style-type: none"> <li>reestablishmentCause</li> </ul>

**R2-1710279.docx**  
99 KB

**Information**

Created 29. Sep 2017 at 11:53  
Modified 29. Sep 2017 at 11:53

42. The official meeting report of the RAN WG2 meeting #99bis held on October 9-13, 2017 in Prague, Czech Republic can be found in Appendix B. According to the 3GPP website at <https://portal.3gpp.org/Meetings.aspx/> which is shown by the screen shot below, that meeting was attended by 276 individuals (out of 336 registered participants):



43. The meeting report has a document list attached (Appendix C) which has T-doc R2-1710279 marked as “available” which clearly indicates that the document was available at the meeting. The screen shot below shows the related excerpt of the document list:

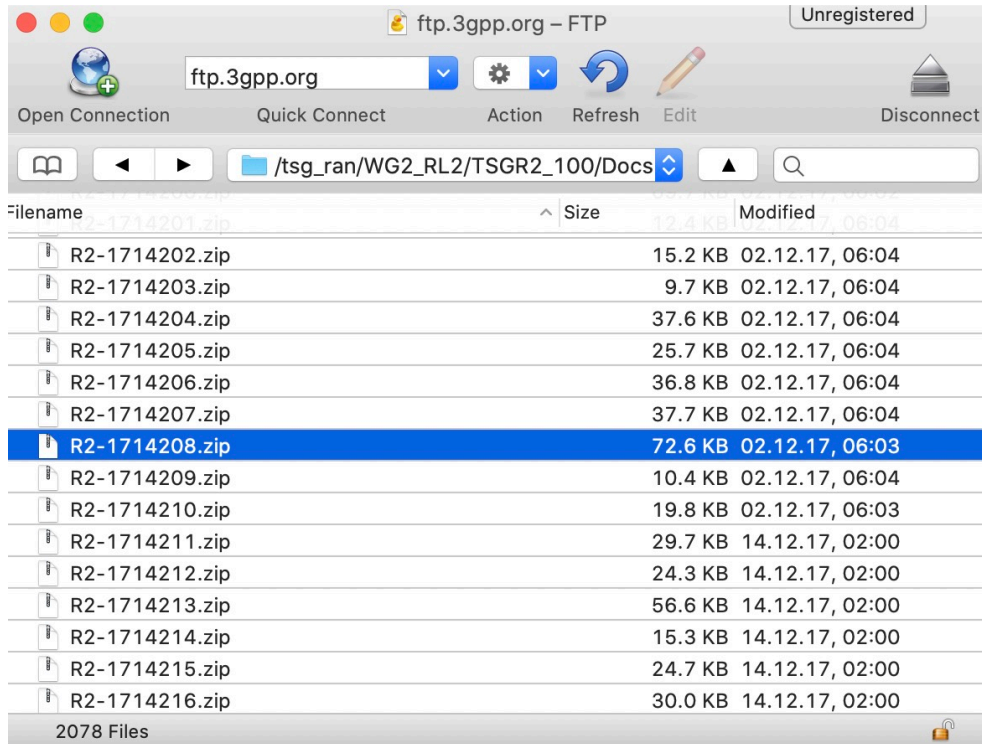
TDoc	Title	Source	TDoc Status	Reservation date	Uploaded
<a href="#">R2-1710279</a>	RRC connection re-establishment and resume procedures in NR	CATT	<b>available</b>	2017-09-27 07:12:32	2017-09-29 03:59:23

44. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available to all 3GPP members and the general public by September 29, 2017, at the latest.

## 2. R2-1714208

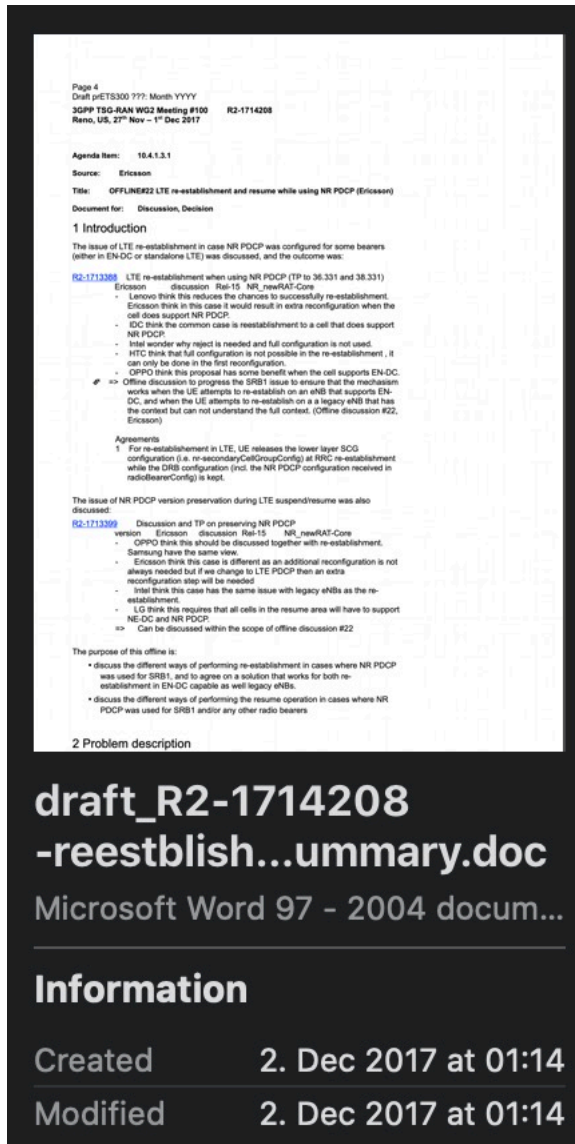
45. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1004 as a true and correct copy of T-doc R2-1714208, which represents a document submitted by Ericsson with the title "OFFLINE#22 LTE re-establishment and resume while using NR PDCP." The document describes the status of an offline discussion and proposals related to LTE connection re-establishment and connection resume operations. On its face, R2-1714208 refers to the RAN WG2 meeting #100 held on 27<sup>th</sup> November – 1<sup>st</sup> December, 2017 in Reno, US. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that R2-1714208 was available either prior or during that meeting to at least all attending 3GPP members. The latest availability of the document is confirmed by the date stamp, December 2, 2017, shown on the historic 3GPP ftp server for the corresponding downloadable file ("R2-1714208.zip"), as maintained by the Internet Archive at [https://web.archive.org/web/20180507051833/http://www.3gpp.org/ftp/TSG\\_RAN](https://web.archive.org/web/20180507051833/http://www.3gpp.org/ftp/TSG_RAN)

/WG2\_RL2/TSGR2\_100/Docs as well as the date stamp for the present-day listing of the same document on the 3GPP ftp server [https://www.3gpp.org/ftp/tsg\\_ran/WG2\\_RL2/TSGR2\\_100/Docs](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_100/Docs) as can be seen at the screen shot below:

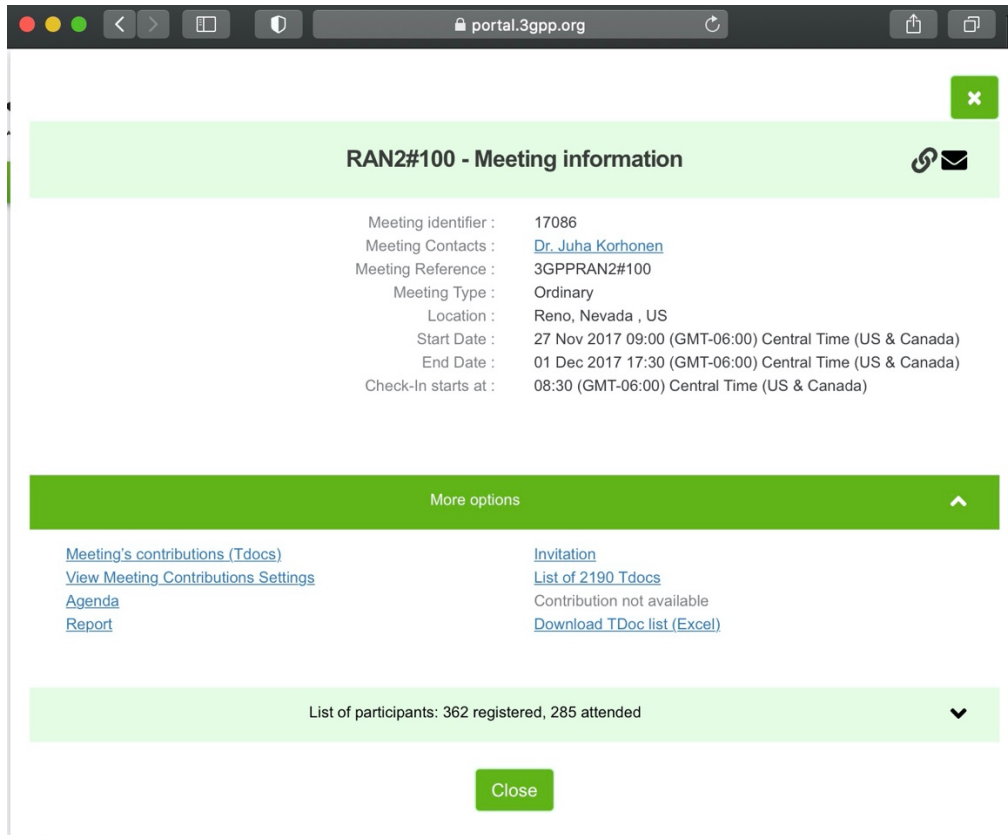


46. In addition, the information for the downloaded and extracted T-doc file states a last Modified date of “2. Dec 2017.” Here is a screenshot showing those file details:





47. The official meeting report of the RAN WG2 meeting #100 held on 27<sup>th</sup> November – 1<sup>st</sup> December, 2017 in Reno, US can be found in Appendix D. According to the 3GPP website at <https://portal.3gpp.org/Meetings.aspx#/> which is shown by the screen shot below, that meeting was attended by 285 individuals (out of 362 registered participants):



48. The meeting report mentions T-doc R2-1714208 on page 160 and records the agreements on this offline discussion topic. The screenshot below shows the related excerpt:

**R2-1714208** OFFLINE#22 LTE re-establishment and resume while using NR PDCCP Ericsson

**Agreements**

- 1 On re-establishment,
  - UE reverts to using LTE PDCCP for SRB1
  - If target eNB supports NR-PDCCP, it can use RRCConnectionReconfiguration to revert the PDCCP version of SRB1 or any other bearers to NR
  - If target eNB doesn't support NR-PDCCP, it can perform full configuration to revert the PDCCP version of all bearers to LTE PDCCP.
- 2 On resume,
  - UE reverts to using LTE PDCCP for SRB1
- 3 The RRCResume message extend to enable configuration of bearers with NR PDCCP

49. The meeting report has a document list attached (Appendix E) which has T-doc R2-1714208 marked as “noted” which clearly indicates that the document

was available at the meeting. Furthermore, the document lists reflects the date of upload as November 30, 2017. The screen shot below shows the related excerpt of the document list:

TDoc	Title	Source	Type	For	Agenda item	TDoc Status	Reservation date	Uploaded
<a href="#">R2-1714208</a>	OFFLINE#22 LTE re-establishment and resume while using NR PDCP	Ericsson	discussion	Decision	10.4.1.3.1	noted	2017-11-30 20:47:55	2017-11-30 20:47:55

50. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available to all 3GPP members attending the RAN WG2 meeting #100 by November 30, 2017, and to the general public by December 2, 2017, at the latest.

**V. AVAILABILITY FOR CROSS-EXAMINATION**

51. In signing this declaration, I recognize that the declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will cooperate to the best of my ability to appear for cross examination within the United States during the time allotted for cross examination.

**A. Right To Supplement**

52. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

**B. Signature**

53. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

54. I declare under penalty of perjury that the foregoing is true and correct.

Dated: March 12, 2021



---

Friedhelm Rodermund

# **APPENDIX A**

# CURRICULUM VITAE

---

## I. PERSONAL DATA

Name: **Friedhelm RODERMUND**

Mailing address: Am Steiner Graben 18  
56077 Koblenz, Germany

Phone: +49 172 2606489

Email: friedhelm.rodermund@iotecc.com

---

## II. PROFESSIONAL EXPERIENCE

### Summary

Senior expert in telecommunications and Internet of Things (IoT) technology. 25 years of experience within the mobile communications industry, and several years in the IoT domain in various roles such as project management, technology innovation and evolution, standards development, technology strategy, patent creation and support of patent litigations, and development/introduction of new services.

Widely recognized standards expert who was actively involved in leading roles in the development of key standards for mobile telephony/data and service enablers across standards development organizations such as 3GPP, ETSI, GSMA, IETF, OMA, and oneM2M. Currently focussing on standards for the Internet of Things.

Founder and director of IOTECC GmbH which provides consulting services around technologies and standards enabling the Internet of Things, and provides consulting services related to patents for mobile telecommunications and IoT.

**01/2015 – present IOTECC GmbH Koblenz, Germany**

#### Founder and CEO

- Mobile telecommunications, Internet of Things (IoT) and Machine to Machine (M2M) technology and standards consulting
- Telecommunications and IoT patent consulting
  - Consulting services around telecommunications and IoT patents in particular related to ETSI, 3GPP, and OMA standards
  - State of the art/prior art research services related to patent creation e.g. for new 5G patents
  - Prior art research, patent infringement analysis related to litigations and validity actions
  - Advising on Standards Development Organisations (SDO) working processes and IPR policy, ETSI IPR Special Committee delegate
  - Experienced expert witness (please see section III for a list of supported actions)

**11/2014 – 12/2014 Friedhelm Rodermund Consulting Koblenz, Germany**

#### Internet of Things (IoT) Consultant

- M2M/IoT standards development and introduction of new M2M/IoT services

# CURRICULUM VITAE

---

- 01/2011 – 10/2014**    **Vodafone Germany / Vodafone Group R&D**    **Düsseldorf, Germany**
- Senior Standards Strategist
- Representing Vodafone in various standardisation bodies
  - Driving the standardisation of the Internet of Things
  - Work item lead, technical editor and key contributor of Open Mobile Alliance (OMA) “Lightweight M2M (LwM2M)” – the new standard for the Internet of Things
  - Advising and supporting various M2M projects related to e.g. automotive, smart metering, health, industry
  - Advising on the introduction of new M2M technologies and services
  - Leading Proof of Concepts of emerging technologies
  - Involved in innovation projects
  - Supporting the creation and protection of Intellectual Property
- 01/2009 – 12/2010**    **Vodafone Germany**    **Düsseldorf, Germany**
- Vice Chairman Open Mobile Alliance (OMA) Device Management (DM)
- Responsible for Vodafone’s Device Management standardisation
  - As OMA DM Vice Chairman, co-leading the group, chairing committee meetings and web conferences, steering the technical direction, management of the different work items
  - Editor of several specifications, rapporteur of various work items
  - Support of projects for the introduction of device management
  - Delegate to 3GPP SA1 where I was responsible for the introduction of MTC (machine type communications) related service/network requirements
- 01/2005 – 12/2008**    **Vodafone Germany**    **Düsseldorf, Germany**
- Project Manager Mobile Broadcast Standards
- Responsible for Mobile Broadcast standardisation across different broadcast systems/standards bodies and across all Vodafone local operations
  - Responsible for Mobile Broadcast standardisation strategy development and implementation
  - Delegation Lead for the Open Mobile Alliance (OMA) BCAST working group
  - Initiated and managed the BCAST device profile development in the BMCO Forum
  - Leading the "Service Protection" (pay-TV) stream of the German DVB-H Consortium
  - Filed several patents
  - Supporting patent litigations and patent portfolio evaluation (various technical areas)
- 04/2003 – 12/2003**    **GSM Association**    **London, United Kingdom**
- Member of the MMS Task Force
- Verification of the MMS operator interworking framework
  - Supporting the definition and specification of the MMS functional evolution
  - Acting as a “link” between 3GPP and GSMA in the area of MMS
- 06/1998 – 12/2004**    **European Telecommunications Standards Institute (ETSI)**  
**Sophia Antipolis, France**
- 01/2002 – 12/2004: Secretary 3GPP Technical Specifications Group “Terminals” and Terminals Working Group 2 “Terminal Services and Capabilities”
- 01/1999 – 12/2001: Secretary 3GPP Terminals Working Group 2 “Terminal Services and Capabilities” and GERAN 3 “Base Station Testing”





## CURRICULUM VITAE

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### III. LIST OF SUPPORTED PATENT LITIGATIONS AND VALIDITY ACTIONS

- 2021  
Optis Cellular Technology LLC et al. v. Apple  
Claim No. HP-2019-000006 (High Court of Justice, Business and Property Courts of England and Wales)  
On behalf of Apple  
Counsel: WilmerHale  
Role: Expert witness and consulting services
- 2020  
Panoptis Patent Management LLC et al. v. Apple Inc.  
Civil Action No. 2:19-cv-66 (E.D. Tex.)  
On behalf of Apple  
Counsel: WilmerHale  
Role: Expert witness at bench trial
- 2020  
Sol IP, LLC v. AT&T Mobility, LLC et al.  
Civil Action No. 2:18-cv-526 (E.D. Tex.)  
On behalf of AT&T, Verizon, Sprint  
Counsel: Gibson Dunn  
Role: Expert witness and consulting services
- 2020  
Bell Northern Research LLC v. LG Electronics Inc. et al.  
Civil Action No. 18-CV-2864-CAB-BLM (S.D. Cal.)  
On behalf of LG Electronics Inc.  
Counsel: Fish&Richardson  
Role: Expert witness and consulting services
- 2019  
Conversant Wireless Licensing S.a.r.l. v. LG Electronics Deutschland GmbH  
Civil Action No. 7 O 3277/18 (Landgericht Munich, Germany)  
On behalf of LG Electronics Deutschland GmbH  
Counsel: Wildanger Kehrwald Graf von Schwerin & Partner mbB  
Role: Expert witness and consulting services
- 2019  
Bell Northern Research, LLC v. Huawei Device Co., Ltd, et al.  
Civil Action No. 3:18-cv-01784-CAB-BLM  
On behalf of Huawei  
Counsel: Fish&Richardson  
Role: Expert witness and consulting services
- 2019  
Uniloc USA, Inc., et al. v. Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd.  
Civil Action Nos. 2:18-cv-00040-JRG, 2:18-cv-00041-JRG, 2:18-cv-00042-JRG and 2:18-cv-00044-JRG (United States District Court for the Eastern District of Texas)  
On behalf of Samsung  
Counsel: Greenberg Traurig  
Role: Expert witness and consulting services
- 2019  
Uniloc USA, Inc., et al. v. Huawei Device USA, Inc. et al.  
Civil Action No. 2:18-cv- 00072-JRG-RSP (E.D. Tex.)  
On behalf of Huawei  
Counsel: McGuireWoods

## CURRICULUM VITAE

---

Role: Expert witness and consulting services

2019

Microsoft Corporation v. Uniloc 2017 LLC  
Inter Partes Review of U.S. Pat. No. 7,167,487  
Inter Partes Review of U.S. Pat. No. 7,075,917  
On behalf of Microsoft and on behalf of Apple as joinder petitioner  
Counsel: Klarquist Sparkman (Microsoft), Erise IP (Apple)  
Role: Expert witness and consulting services

2019

Qualcomm v. KFTC  
South Korean Case, Seoul High Court  
On behalf of intervenor Apple supporting the KFTC  
Counsel: Boies Schiller Flexner  
Role: Expert witness

2018/19

Evolved Wireless, LLC v. Apple, Inc.  
Civil Action No. 1:15-cv-00542-JFB-SRF  
On behalf of Apple  
Counsel: DLA Piper  
Role: Expert witness and consulting services

2018/19

Cisco Systems Inc. v. Traxcell Technologies  
Inter Partes Review of Traxcell Technologies patents  
On behalf of Cisco  
Counsel: King&Spalding  
Role: Expert witness and consulting services

2018/19

Qualcomm Inc. v. Apple Inc.  
Civil Action No. 3:17- cv-02398-DMS-MDD (United States District Court for the Southern District of California)  
Civil Action No. 3:17-cv-02402-WQH-MDD  
Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof (II), Inv. No. 337-TA-1093  
Inter Partes Review of U.S. PATENT NO. 9,154,356  
Cases IPR2019-00047, IPR2019-00048, IPR2019-00049, IPR2019-00128, IPR2019-00129  
On behalf of Apple and Intel  
Counsel: WilmerHale  
Role: Expert witness and consulting services

2018/19

Apple Inc. v. Qualcomm Inc.  
Civil Action No. 3:17-CV-00108-GPC-MDD (United States District Court for the Southern District of California)  
On behalf of Apple  
Counsel: Fish&Richardson, Boies Schiller Flexner  
Role: Expert witness and consulting services

2018

3G Licensing, S.A. et al. v. LG Electronics Inc. et al  
Inter Partes Review of U.S. Patent No. 7,995,091  
On behalf of LG Electronics  
Counsel: Fish&Richardson  
Role: Expert witness

2017

Huawei Technologies Co. LTD. v. T-Mobile US, Inc. & T-Mobile USA, Inc.

## CURRICULUM VITAE

---

E.D. Tex. Case Nos. 2:16-cv-00052-JRG-RSP; 2:16-cv-00055-JRG-RSP; 2:16-cv-00056-JRG-RSP; and 2:16-cv-00057-JRG-RSP

On behalf of T-Mobile

Counsel: Gibson Dunn

Role: Expert witness and consulting services

2016

Koninklijke KPN N.V. v. Samsung Electronics America, Inc. et al.

Civil Action No. 14-cv-1165

On behalf of Samsung Electronics

Counsel: Baker Botts

Role: Expert witness and consulting services

2016

SSH v. Sony

OLG Düsseldorf, Germany

On behalf of SSH

Counsel: Cohausz&Florack

Role: Technical expert support

2015/16

LG Electronics v. Core Wireless Licensing S.A.R.L.

Inter Parties Review of U.S. Patent No. 8,165,049

On behalf of LG Electronics

Counsel: Greenberg Traurig

Role: Expert witness

2015/16

Core Wireless Licensing S.A.R.L. v. LG Electronics Inc. and LG Electronics MobileComm U.S.A., Inc

Civil Action No. 2:14-cv-911 (lead case) and Civil Action No. 2:14-cv-912 (consolidated)

On behalf of LG Electronics

Counsel: Greenberg Traurig, Sidley Austin

Role: Expert witness

2015

Intellectual Ventures I LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.

D. Del. Case No. 1:13-cv-01632

Intellectual Ventures II LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.

D. Del. Case No. 1:13-cv-01633

On behalf of T-Mobile

Counsel: Gibson Dunn

Role: Technical expert support

#### IV. EDUCATION

- |                          |  |                          |
|--------------------------|--|--------------------------|
| <b>10/1984 – 10/1993</b> | <b>University of Technology Aachen</b>   | <b>Aachen, Germany</b>   |
|                          | <u>Graduate of Electrical Engineering with a focus on telecommunications technologies (Dipl.-Ing. TH)</u>      |                          |
| <b>10/1992 – 04/1993</b> | <b>University of Technology Trondheim</b>  | <b>Trondheim, Norway</b> |
|                          | <u>Diploma Thesis "Design of a dual processor computer for digital signal processing in power electronics"</u> |                          |

#### V. LANGUAGES

German, English, French

### VI. RECENT PUBLICATIONS

- "Unlocking the internet of things and driving the need for interoperability", Global Telecoms Business, December 2013
- "The need for standardisation in the M2M services layer", Global Telecoms Business, February 2014
- Co-authored white paper "Lightweight M2M: Enabling device management and applications for the internet of things", Open Mobile Alliance, March 2014
- "Objects are a new way to create M2M applications", Global Telecoms Business, April 2014
- "The need for standardisation in the M2M services layer", M2M Now, July 2015

# **APPENDIX B**

**3GPP TSG-RAN WG2 meeting #100**

**R2-1712101**

**Reno, Nevada, USA, November 27 – 1 December, 2017**

**Agenda Item:** 2.2

**Source:** ETSI MCC

**Title:** Report of 3GPP TSG RAN2#99bis meeting, Prague, Czech Republic

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**Document for:** Approval

**Report of 3GPP TSG RAN WG2 meeting #99bis  
Prague, Czech Republic  
9 - 13 October, 2017**

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## Organisation of the meeting

Meeting:	3GPP TSG RAN2#99bis	
Meeting location:	Prague, Czech Republic	
Duration:	09.10 - 13.10.2017	
Host:	EF3	
TSG RAN WG2 Chairman:	Richard Burbidge (Intel Corporation) (richard.c.burbidge@intel.com)	
TSG RAN WG2 Vice chairman:	Hu Nan (CMCC) (hunan@chinamobile.com)	
TSG RAN WG2 Vice chairman:	Johan Johansson (MediaTek) (johan.johansson@mediatek.com)	
TSG RAN WG2 MCC Support:	Juha Korhonen (ETSI MCC) (juha.korhonen@etsi.org)	
Email reflector:	3GPP_TSG_RAN_WG2@LIST.ETSI.ORG	
Technical documents:	ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_99bis/Docs	
Next meetings:	TSG RAN2#100	27.11 - 01.12.2017, Reno, USA
	TSG RAN#78	18.12 - 21.12.2017, Lisbon, Portugal
	TSG RAN2#NR_1801	22.01 - 26.01.2018, Vancouver, Canada

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## Statistics/Executive Summary

TSG RAN2#99bis was held in Prague, Czech Republic, hosted by European Friends of 3GPP (EF3). The meeting had 6 breakout sessions in addition to the main session. The main session was mainly about NR and NR control plane. The parallel sessions were:

- LTE and NR User Plane;
- LTE
- NB-IoT and MTC
- Positioning Accuracy Enhancements
- Rel-15 V2X
- Rel-15 MTC

The statistics from this meeting are:

- 276 participants checked in (registered: 336 participants).
- 2080 Tdoc numbers allocated with 1983 available contributions. (See the attached tdoc list)
- 78 incoming liaison statements, out of which 76 were noted and 1 was withdrawn (submitted with wrong attachments). The remaining LSin will be handled in RAN2#100.
- 39 outgoing liaison statements.
- 61 email approvals/discussions scheduled after RAN2#99bis meeting, see Annex F for details.
- Number of CRs submitted 141. Out of these, 37 were agreed in-principle. See Annex E for details.

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# 1 Opening of the meeting (9 AM)

## 1.1 Call for IPR

The attention of the delegates of this Working Group is drawn to the fact that **3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective Organizational Partners of Essential IPRs** they become aware of.

The delegates were asked to take note that they were hereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.
- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Statement and the Licensing declaration forms (<http://webapp.etsi.org/Ipr/>).

*NOTE: IPRs may be declared to the Director-General or Chairman of the SDO, but not to the RAN WG2 Chairman.*

## 1.2 Network usage conditions

*The PCG has laid down the following network usage conditions*

**1. Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.**

**2. Users shall not engage in non-work related activities that consume excessive bandwidth** or cause significant degradation of the performance of the network.

Since the network is a shared resource, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

- 1. DON'T place your WiFi device in ad-hoc mode**
- 2. DON'T set up a personal hotspot in the meeting room**
- 3. DO try 802.11a if your WiFi device supports it**
- 4. DON'T manually allocate an IP address**
- 5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files**
- 6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)**

## 1.3 Other

In accordance with the Working Procedures it is reaffirmed that:

(i) compliance with all applicable antitrust and competition laws is required;

(ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full

and fair consideration of such matters; and

(iii) the chairman will conduct the meeting with strict impartiality and in the interests of 3GPP

*Note on (i): In case of question please contact your legal counsel.*

*Note on (ii): WIDs don't need to be submitted to the RAN2 meeting and will typically not be discussed here either.*

---

## 2 General

*THANK YOU to companies that request TDoc numbers and submit contributions early before deadline (really appreciated). Will start to refrain from treating late documents.*

### 2.1 Approval of the agenda

*A draft schedule for the week is provided as a separate document, distributed via the RAN2 email reflector and made available during the meeting week in the RAN2\Inbox\Chairmans\_Notes folder.*

R2-1710000 Agenda for RAN2#99bis Chairman agenda  
=> Approved

### 2.2 Approval of the report of the previous meeting

R2-1710001 RAN2#99 Meeting Report MCC report  
=> Approved

### 2.3 Reporting from other meetings

Summary of the RAN2 impacting items from RAN#77

#### LTE

**UDC:** A new WI to specify UDC was agreed as a working agreement in RP-172076. The working agreement has no impact to RAN2 work in Q4 - RAN2 should progress the work as with any other WI.

**feD2D:** The SI was extended by one quarter in order to address SA2 issues raised in the related REAR study item, as described in the status report in RP-172091.

#### NR

**Prioritisation:** RAN performed a prioritisation task to identify the priorities for completion by December 2017, and to help manage the workload of the WGs. A summary of this activity from the RAN chairman was endorsed in RP-172114 which refers to a number of other endorsed documents - the ones most relevant to RAN 2 are covered below.

For the RAN2 prioritisation activity, the endorsed document RP-172087 describes that during Q4 we will be prioritise topics that are needed EN-DC completion, and then with any remaining time we will progress items for standalone (i.e. very similar to what we have already been doing in the last few meetings). I will identify within the agenda which standalone topics I would like to treat in any remaining time. The document also provides clarification on some specific items that do not have to be completed for the December 2017 specifications (see slide 4).

RAN1/2 led study items are all deferred until 2018. For RAN2 this only impacts the SI on IAB which was due to start at the November meeting. This will now start at the January ad hoc meeting.

**Single UL Tx:** A way forward on single uplink transmission was endorsed in documents RP-172064 and RP-172085 with the latter describing the capability signalling that RAN2 need to complete in Q4. This has also been communicated to RAN2 in LS RP-172100.

**UE capabilities for NR:** RAN agreed that UE categories will be defined for marketing purposes and will not be signalled from the UE to the network. RAN will decide the definition of the categories. This is captured in LS RP-172133.

**Revised NR WID** was approved in RP-172115 although the changes to not have significant impact to RAN2 work.

## 2.4 Others

### Rapporteur changes

Spec	former rapporteur	proposed new rapporteur
TS38.331	Kai-Erik Sunell (Ericsson)	Håkan Palm (Ericsson)
TS36.314.	Yi Guo (Huawei)	Chen Jun (Huawei)

=> Rapporteur changes are approved

### Isolated impact analysis

Note that an isolated impact analysis is required for Rel-8 to Rel-14 CRs from Q3 2017 onwards.

Only corrections where there is a proven problem are allowed for frozen releases (Rel-8 to Rel-14).

### RAN2 WG compendium

Latest version can always be found at [ftp://ftp.3gpp.org/tsg\\_ran/WG2\\_RL2/Org/RAN2\\_Compndium/](ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/Org/RAN2_Compndium/)

### Drafting rules

Note that specification drafting rules in TR 21.801 must be followed when drafting a CR and draft TS/TR.

Latest version can always be found at [http://www.3gpp.org/ftp/specs/archive/21\\_series/21.801/](http://www.3gpp.org/ftp/specs/archive/21_series/21.801/)

### Time Budget

The time budget endorsed at RAN-77 is available in RP-172116

### Offline discussion during RAN2 meeting

Chairs will allocate a number of offline discussions during the meeting. Create a folder with format "NNN\_name" (please use 3 digit number to ensure folders are listed in correct sequence, the name can be anything you like) within inbox/drafts and use this to share any documents relating to the offline discussion. Also use this number in the title of any reflector emails relating to this offline discussion. Do not share documents over the reflector during the meeting.

---

## 3 Incoming liaisons

*Note: LSs are moved to the respective agenda items if any.*



*Liaisons to RAN2*

- R2-1710006 Reply LS on LTE call redirection to GERAN (C1-173752; contact: Nokia) CT1 LS in Rel-15 TEI15 To:RAN2 Cc:SA3, RAN3  
=> Noted
- R2-1710028 Corrections on antenna switching (R1-1715335; contact: Qualcomm) RAN1 LS in Rel-13 LTE\_CA\_TDD\_FDD-Core To:RAN2, RAN4  
=> Noted
- R2-1710042 Reply LS on Support of BCS for Fallback Band Combinations (R4-1708768; contact: Samsung) RAN4 LS in Rel-13 LTE\_CA\_enh-Core To:RAN2  
- Ericsson have discussion paper in 11538.  
=> Noted
- R2-1710050 LS on RAN4 Rel-14 UE Feature List (R4-1709180; contact: Intel) RAN4 LS in Rel-14 TEI14 To:RAN2 Cc:RAN1, RAN3  
- Intel explain most of this is already captured and the remaining part is the interference capability signalling. Some CR is needed to update the R13 signalling and will submit a CR to the next meeting.  
=> Noted
- R2-1710056 LS Seeking clarification on DCI monitoring subframe for eIMTA (R5-175165; contact: Huawei) RAN5 LS in To:RAN2, RAN4  
- Intel think the RAN2 spec needs to be updated.  
=> Offline discussion to conclude if anything is needed in RAN2 specs and how to respond to RAN5. Offline discussion #01 (Huawei)  
=> Draft LS in R2-1711844
- R2-1710067 LS on Paging failures for CE Capable UEs (S2-176685; contact: NTT DOCOMO) SA2 LS in Rel-13 TEI13 To:RAN2, RAN3  
=> Noted  
=> Discussion will be handled in the main session.
- R2-1710245 LS on the number of bearers (S2-176693; contact: Telstra) SA2 LS in Rel-15 TEI15  
- Samsung have a contribution in 10106.  
- Vodafone think we need to look at the whole system NR and LTE and see if they can support a common number.  
- Intel also have a document  
- AT+T think that the number of bearers in LTE should be expanded to 15 or 16 and would like it to be done quickly. T-Mobile support AT+T's comments.  
=> Related document(s) will be treated on Wednesday covering both LTE and NR.

*Liaisons to RAN2 with agreements to take into account*

- R2-1710027 LS on RRC parameters for FeCoMP (R1-1715332; contact: ZTE) RAN1 LS in Rel-15 feCOMP\_LTE-Core To:RAN2  
- Ericsson ask if these are all the parameters. ZTE doesn't know if they will agree more parameters.  
=> Noted
- R2-1711843 LS on no dedicated bearer support over NB-IoT (S2-176690; contact: MediaTek) SA2 LS in Rel-13 CloT To:RAN5, RAN2, CT1  
=> Noted without presentation

*Liaisons with RAN2 in CC*

- R2-1710003 Reply LS on request to update maximum data rate values in EPS (C1-173572; contact: Qualcomm) CT1 LS in Rel-15 5GS\_Ph1-CT, NR\_newRAT-Core To:SA2  
Cc:RAN3, CT4, CT3, SA5, SA1, RAN2  
=> Noted without presentation
- R2-1710043 LS on effect of SRS switching in TDD + FDD CA (R4-1708772; contact: Qualcomm) RAN4  
LS in Rel-12 To:RAN1 Cc:RAN2  
=> Noted without presentation
- R2-1710057 LS on Restricted Use of Enhanced Coverage (R6-170460; contact: Nokia) RAN6 LS in Rel-14  
CloT\_Ext To:CT1 Cc:SA2, RAN2  
=> Noted without presentation
- 

## 4-5 Void

## 6 LTE: Rel-12 and earlier releases

*Including corrections related to the following WIs:*

*(LTE-L23, leading WG: RAN2, REL-8, started: Sep. 06, closed: Dec. 08, WID: RP-080747)*

*(LTE\_CA-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: RP-100661)*

*(LTE\_UL\_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: June 11, WID: RP-100959)*

*(LTE\_eDL\_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: March 11, WID: RP-100196)*

*(LTE\_Relay-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: RP-110911)*

*(MBMS\_LTE\_enh-Core, leading WG: RAN2, REL-10, started: June 10, closed: March 11, WID: RP-101244)*

*(MDT\_UMTSLTE-Core, leading WG: RAN2, REL-10, started: Dec. 09, closed: June 11, WID: RP-100360)*

*(eICIC\_LTE-Core, leading WG: RAN1, REL-10, started: March 10, closed: June 11, WID: RP-100383)*

*(SONenh\_LTE-Core, leading WG: RAN3, REL-10, started: March 10, closed: June 11, WID: RP-101004)*

*(LTE\_CA\_enh-Core, leading WG: RAN1, REL-11, started: March 11, closed: Mar.13, WID: RP-121999)*

*(MBMS\_LTE\_SC-Core, leading WG: RAN2, REL-11, started: June 10, closed: Sep.12, WID: RP-120258)*

*(LTE\_eDDA-Core, leading WG: RAN2, REL-11, started: March 11, closed: Dec.12, WID: RP-120256)*

*(LCS\_LTE-NBPS-Core, leading WG: RAN2, REL-11, started: March 09, closed: June. 13, WID: RP-131259)*

*(eICIC\_enh\_LTE-Core, leading WG: RAN1, REL-11, started: March 11, closed: Dec. 12, WID: RP-120860)*

*(SPIA\_IDC\_LTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec. 12, WID: RP-111355)*

*(COMP\_LTE\_DL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: RP-111365)*

*(COMP\_LTE\_UL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: RP-111365)*

*(LTE\_TDD\_add\_subframe, leading WG: RAN1, REL-11, started: March 12; closed: Sep. 12, WID: RP-120384)*

*(FS\_HetNet\_eMOB\_LTE, leading WG: RAN2, REL-11, started: March 11, closed: Sep. 12, WID: RP-110709)*

*(LTE\_enh\_dl\_ctrl-Core, leading WG: RAN1, REL-11, started: Dec. 11, closed: Dec. 12, WID: RP-120871)*

*(LTE\_SC\_enh\_dualC-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Dec.14, WID: RP-141797)*

*(LTE\_SC\_enh\_L1-Core, leading WG: RAN1, REL-12, started: Dec.13, closed: Dec.14, WID: RP-132073)*

*(LTE\_D2D\_Prox-Core, leading WG: RAN1, REL-12, started: Mar.14, closed: Mar.15, WID: RP-142043)*

*(MBMS\_LTE\_OS-Core, leading WG: RAN2, REL-12, started: Sep.13, closed: Dec.14, WID: RP-140282)*

(LTE\_NAICS-Core, leading WG: RAN1, Rel-12, started: Mar 14, closed: Dec.14, WID: RP-140519)  
 (LC\_MTC\_LTE-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Dec 14, WID: RP-140522)  
 (GCSE\_LTE-MBMS\_CM-Core, leading WG: RAN3, started: Sep. 14, closed: Mar. 2015, WID: RP-141035)  
 (LTE\_CA\_TDD\_FDD-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Jun 14, WID: RP-140465)  
 (LCS\_BDS-LTE-Core, leading WG: RAN2, REL-12, started: Mar 13, closed: Dec 13, WID: RP-130416)  
 (LTE\_eDL\_MIMO\_enh-Core, leading WG: RAN1, REL-12, started: Sep 12, closed: June 14, WID: RP-121416)  
 (HetNet\_eMOB\_LTE-Core, leading WG: RAN2, REL-12, started: Dec.12, , closed: Sep 14, WID: RP-122007)  
 (Cov\_Enh\_LTE-Core, leading WG: RAN1, REL-12, started: Jun.13, closed: Jun.14, WID: RP-130833)  
 (LTE\_TDD\_eIMTA-Core, leading WG: RAN1, REL-12, started: Dec 12, closed: Jun.14, WID: RP-121772)  
 (SCM\_LTE-Core, leading WG: RAN2, REL-12, started: Mar.14, closed: Sep.14, WID: RP-140434)

Including any LTE corrections related to the following joint UMTS/LTE WIs:

(SIMTC-RAN\_OC-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Sep. 12, WID: RP-111373)  
 (eMDT\_UMTSLTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec.12, WID: RP-121204)  
 (SONenh2\_LTE\_UTRA-Core, leading WG: RAN3, REL-11, started: Sep.11, closed: Dec.12, WID: RP-120314)  
 (rSRVCC-GERAN, leading WG: GERAN2, REL-11, started: Sep.11, closed: Nov.13, WID: GP-111290)  
 (EHNB\_enh3-Core, leading WG: RAN3, REL-12, started: Sep.12, closed: Dec 13, WID: RP-130741)  
 (MTCe\_RAN-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: RP-132053)  
 (UTRA\_LTE\_WLAN\_interw-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: RP-132101)  
 (LTE\_UTRA\_IncMon-Core, leading: RAN4, REL-12, started: Dec.13, closed: Dec. 14, WID: RP-132061)

R2-1710551	UE capabilities for Tx antenna selection	Qualcomm Incorporated	CR	Rel-13	36.331
	13.7.0 3080 - F LTE_CA_TDD_FDD-Core				
	=> Move impact analysis to summary of change				
	=> Change maxSimultaneousBands-r13 to the r-10				
	=> Update inter-operability to capture difference between new and old behaviour				
	=> The CR is revised in R2-1711845				
R2-1711845	UE capabilities for Tx antenna selection	Qualcomm Incorporated	CR	Rel-13	36.331
	13.7.0 3080 - F LTE_CA_TDD_FDD-Core				
	[CB #300]				
R2-1710552	UE capabilities for Tx antenna selection	Qualcomm Incorporated	CR	Rel-14	36.331
	14.4.0 3081 - A LTE_CA_TDD_FDD-Core				
	=> Not treated				
R2-1710553	UE capabilities for Tx antenna selection	Qualcomm Incorporated	CR	Rel-13	36.306
	13.7.0 1510 - F LTE_CA_TDD_FDD-Core				
	=> The CR is revised in R2-1711846				
R2-1711846	UE capabilities for Tx antenna selection	Qualcomm Incorporated	CR	Rel-13	36.306
	13.7.0 1510 - F LTE_CA_TDD_FDD-Core				
	[CB #300]				
R2-1710554	UE capabilities for Tx antenna selection	Qualcomm Incorporated	CR	Rel-14	36.306
	14.4.0 1511 - A LTE_CA_TDD_FDD-Core				

=> Not treated

R2-1711276 MIMO spatial multiplexing continuity Nokia, Nokia Shanghai Bell CR Rel-10  
 36.331 10.21.0 3097 - F TEI10

- Ericsson thinks that the intention was to keep the re-establishment case simple. We can have the continuity with the reconfiguration. Nokia thinks that we lose the continuity as the network would have to downgrade the UE.
- Samsung thinks that this is a minor enhancement and we should keep the current specification. Intel agrees with Samsung.
- Ericsson asks if we need a new UE capability
- Nokia thinks that one compromise is to have it as TEI14 as mandatory if the UE 4 layer MIMO supports.
- Samsung thinks that re-establishment doesn't happen often and the gains are small. Qualcomm thinks that the benefits are not very clear as at RLF we will have low SINR.

=> The CR is not pursued

R2-1711277 MIMO spatial multiplexing continuity Nokia, Nokia Shanghai Bell CR Rel-11  
 36.331 11.18.0 3098 - A TEI10

=> Not treated

R2-1711278 MIMO spatial multiplexing continuity Nokia, Nokia Shanghai Bell CR Rel-12  
 36.331 12.15.0 3099 - A TEI10

=> Not treated

R2-1711279 MIMO spatial multiplexing continuity Nokia, Nokia Shanghai Bell CR Rel-13  
 36.331 13.7.0 3100 - A TEI10

=> Not treated

R2-1711280 MIMO spatial multiplexing continuity Nokia, Nokia Shanghai Bell CR Rel-14  
 36.331 14.4.0 3101 - A TEI10

=> Not treated

R2-1711281 UL CA IDC clarification Nokia, Nokia Shanghai Bell discussion SPIA\_IDC\_LTE-Core

*Proposal 1: UE is only allowed to include non-serving frequencies in addition to the current serving UL CA combination (can't send only non-serving frequencies).*

- Qualcomm agrees
- Ericsson understands that the report should include all serving cell in the measurement object.

=> No need to capture in the specification

*Proposal 2: InDeviceCoexIndication message implicitly "expires" when UL CA is deconfigured, including the case when RRCConnectionReconfiguration message includes both deconfiguration and configuration of SCCells.*

- Qualcomm doesn't think note 3 is needed. Nokia explains that it covers the case where on SCell is released and added with same measurement ID.
- Samsung understands the intention but thinks that a smart eNB can identify the scenarios and can reconfigure to solve the problem.
- Nokia would just like to understand what is the expected behaviour.

=> the discussion is moved to email discussion

=> Noted

☒ **[99bis#45][LTE/IDC] – UL CA IDC problems (Nokia)**

- Identify problematic scenarios
- Identify expected UE behaviour
- Conclude if a CR is needed
- Deadline: Thursday 2017-11-09

R2-1711282	Correction to UL CA IDC problem signalling 13 36.331 13.7.0 3102 - F	Nokia, Nokia Shanghai Bell SPIA_IDC_LTE-Core	CR	Rel-
	=> Not treated			
R2-1711283	Correction to UL CA IDC problem signalling 14 36.331 14.4.0 3103 - A	Nokia, Nokia Shanghai Bell SPIA_IDC_LTE-Core	CR	Rel-
	=> Not treated			

**New CRs related to incoming LS (R2-1710056) from RAN5 on DCI monitoring subframe for eIMTA:**

R2-1711990	DCI monitoring subframes for eIMTA LTE_TDD_eIMTA-Core 3123 F	Huawei, HiSilicon	CR	Rel-12	36.331
	=> Agreed in principle				
R2-1711991	DCI monitoring subframes for eIMTA LTE_TDD_eIMTA-Core 3124 A	Huawei, HiSilicon	CR	Rel-13	36.331
	=> Agreed in principle				
R2-1711992	DCI monitoring subframes for eIMTA LTE_TDD_eIMTA-Core 3125 A	Huawei, HiSilicon	CR	Rel-14	36.331
	=> Agreed in principle				
R2-1711844	[DRAFT] Reply LS on Seeking clarification on DCI monitoring subframe for eIMTA out To:RAN5 Cc:RAN4	Huawei LS			
	=> Approved in R2-1712036				

## 7 LTE: Rel-13

### 7.1 WI: Further LTE Physical Layer Enhancements for MTC

(LTE\_MTCe2\_L1-Core, leading WG: RAN1, REL-13; started: Sep. 14, closed: Mar. 16, WID: RP-150492)

*Documents in this agenda item will be handled in a break out session*

*Including output from email discussion [99#40][MTC] UE in CE (Intel)*

#### Terminology

R2-1710645	Email discussion report on [99#40][MTC] UE in CE 13 LTE_MTCe2_L1-Core	Intel Corporation	discussion	Rel-
R2-1710646	Clarifications for a UE in coverage enhancement 36.331 13.7.0 3082 - F LTE_MTCe2_L1-Core	Intel Corporation	CR	Rel-13

- Char wonders if we include the case of “normal UE in normal coverage has a BR configuration” in the attempts of clarifications. Intel think such a UE behave as a BL UE. QC think that such case is not relevant for barring and the barring text is ok as it is.
- LG think that the text for barring need clarification, “barred for enhanced coverage operation” is not clear if we cross-reference to 36.304. We might then need a CR for 36.304.
- ZTE think that the cell should be barred also for normal coverage.
- Sequans wonders if now a “UE in CE” is not the same as a “UE in enhanced coverage”. Sequans think confusion already existed before. “UE in CE” definition causes confusion for BL UEs. if “UE in CE” is kept the same as UE in enhanced coverage it would be clear.
- Barring: Huawei agrees with the intention and think the clarification is ok. Ericsson and ZTE don't like the clarification.

⇒ RAN2 understands that a UE that has the capability to use SIB1, which bars a cell because he in Enhanced coverage and cannot get SIB1-BR, do no longer have to bar the cell (for this reason) if he moves into Normal Coverage.

⇒ RAN2 understands that the current text in the barring section can be interpreted like this, and we don't do the update for this section.

Offline on terminology clarifications 203 (Intel).

- After offline Intel proposes to postpone to next meeting
- => Postponed

R2-1710647 Clarifications for a UE in coverage enhancement Intel Corporation CR Rel-14  
36.331 14.4.0 3083 - A LTE\_MTCe2\_L1-Core

### Paging

R2-1711456 Paging failure for CE capable UEs Qualcomm Incorporated discussion

R2-1711511 CE Mode Indication Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3116 -  
F LTE\_feMTC-Core

*Above two docs were treated in the main session.*

R2-1711660 Correction on starting subframe of MPDCCH repetition for Paging NTT DOCOMO INC. CR  
Rel-13 36.304 13.7.0 0390 - F LTE\_MTCe2\_L1-Core

- Intel think that the agreement is that the eNB shall ensure that there are no collisions. QC wonders if there can be other collisions than MPDCCH repetitions.
- Can think about this

⇒ **postpone**

R2-1711661 Correction on starting subframe of MPDCCH repetition for Paging NTT DOCOMO INC. CR  
Rel-14 36.304 14.4.0 0391 - A LTE\_MTCe2\_L1-Core

⇒ **postpone**

R2-1711209 Paging monitoring in RRC\_CONNECTED in Rel-13 MTC Huawei, HiSilicon discussion  
Rel-13 LTE\_feMTC-Core R2-1709726

- Chair wonders if there could be BL UEs or UEs in CE that actually have the capability to receive ETWS or CMAS in Connected. The proposed text seems to prevent this. ZTE agrees and have some concerns.
- Ericsson agrees with the intention but think for the CR we might need more changes.

⇒ **Clarify in 36.331 and 36.300 that a BL UE or UE in CE in RRC\_CONNECTED is not required to monitor Paging for SI update, including ETWS/CMAS.**

R2-1711210 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
CR Rel-13 36.331 13.7.0 3045 - F LTE\_feMTC-Core R2-1709385

R2-1711211 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
CR Rel-14 36.331 14.4.0 3046 - A LTE\_feMTC-Core R2-1709386

R2-1711212 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
CR Rel-13 36.300 13.9.0 1054 - F LTE\_feMTC-Core R2-1709387

R2-1711213 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
CR Rel-14 36.300 14.4.0 1055 - A LTE\_feMTC-Core R2-1709388

Offline discussion 204 (Huawei) to perfect the CRs, Revisions of the Rel-13 CRs in R2-1711881 (RRC), R2-1711882 (Stage-2).

R2-1711881 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
CR Rel-13 36.331 13.7.0 3045 1 F LTE\_feMTC-Core R2-1709385

⇒ **Agreed in principle**

R2-1711882 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
CR Rel-13 36.300 13.9.0 1054 - F LTE\_feMTC-Core R2-1709387

⇒ **Agreed in principle**

**36.331**

- R2-1710534 SI accumulation over SI windows Ericsson CR Rel-14 36.331 14.4.0 3078 -  
A LTE\_MTCe2\_L1-Core
- QC and Intel think that “depending on coverage condition” is unclear,
  - Huawei think we don’t need this change. This should already be clear. Ericsson agree this is not new but a clarification intended for RAN4, to make this assumption explicit.
  - Intel think that 5.2.3a already describes all cases, and if needed then we should update this section.
- Offline check whether this is needed or not (Ericsson). Revision of the rel-13 version in R2-1711896
- ⇒ **Not pursued**
- R2-1710535 SI accumulation over SI windows Ericsson CR Rel-13 36.331 13.7.0 3079 -  
F LTE\_MTCe2\_L1-Core
- R2-1711896 SI accumulation over SI windows Ericsson CR Rel-13 36.331 13.7.0 3078 1  
F LTE\_MTCe2\_L1-Core
- Huawei think that the CR is not needed as the old text includes “continue reception and accumulation”.
- ⇒ **Not pursued**
- R2-1711230 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
CR Rel-13 36.331 13.7.0 3095 - F LTE\_feMTC-Core
- Ericsson have sympathy for this change. It seems strange to refer to the non-serving frequency in SIB3, and maybe SIB5 need some corresponding update.
  - Chair comment that non-serving is maybe correct in this case as the Info for the serving cell is in SIB1, but maybe “frequency” is not completely correct.
- Offline discussion 205 (Huawei), on what exactly to correct, revision in R2-1711886.
- R2-1711886 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
CR Rel-13 36.331 13.7.0 3095 - F LTE\_feMTC-Core
- Intel has interpreted acc to the old text in the field description.
  - QC would like more time to check.
  - Huawei think that the interpretation that SIB1 configures intra-frequency neighbours is not aligned with legacy behaviour and is problematic as the same value has to be used for serving cell and neighbour cells.
- ⇒ **postpone**
- R2-1711231 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
CR Rel-14 36.331 14.4.0 3096 - A LTE\_feMTC-Core
- ⇒ **postpone**
- R2-1711644 Aligment of FGI4 (Short DRX) for Cat M1 Ericsson CR Rel-13 36.331 13.7.0 3119  
- F LTE\_MTCe2\_L1-Core
- Nokia is wondering if this is really related to Category or if it is rather related to configuration of CE mode A or B.
  - Huawei think this is not needed as it is clear from the field description. QC think the CR is about UE capability so it should be clarified. Ericsson explains that this was found during test preparations. Huawei then think the cover sheet should be updated to clearer indicate that this is a clarification. LG agrees with the CR and the reasoning that configuration and capabilities are somewhat separate.
- ⇒ **Agreed in principle**

R2-1711645 Aligment of FGI4 (Short DRX) for Cat M1 and M2 Ericsson CR Rel-14 36.331  
14.4.0 3120 - F LTE\_MTCe2\_L1-Core

⇒ Agreed in principle

### 36.302

R2-1711232 Corrections on TS 36.302 for Rel-13 eMTC Huawei, HiSilicon CR Rel-13  
36.302 13.6.0 0116 - F LTE\_feMTC-Core

- Intel wonders if the figure is for UL or DL
  - Ericsson think that instead of a new figure we could just have a piece of text. Huawei think this would be ok.
  - Check also for NB-IoT
- Offline disc 206, revision in R2-1711887 (Huawei).

R2-1711887 Corrections on TS 36.302 for Rel-13 eMTC Huawei, HiSilicon CR Rel-13  
36.302 13.6.0 0116 - F LTE\_feMTC-Core

- LG think this is ok, but summary of change and reason for change need update to include NB-IoT, and think that "O" in NB-IOT shall not be in captials.

⇒ Change the "o", update coversheet incl WI code to include NB-IoT.

⇒ With these changes the CR is in-principle agreed, change to be included for next meeting.

R2-1711233 Corrections on TS 36.302 for Rel-13 eMTC Huawei, HiSilicon CR Rel-14  
36.302 14.3.0 0117 - A LTE\_feMTC-Core

## 7.2 WI: Narrowband IOT

*(NB\_IOT-Core; leading WG: RAN1; started: Sep. 15; target: Jun. 16; WID: RP-152284)*

*Documents in this agenda item will be handled in a break out session*

## 7.3 Other LTE Rel-13 WIs

*Including corrections related to the following WIs:*

*(LTE\_LAA-Core, leading WG: RAN1, REL-13; started: June 15, closed: Dec. 15, WID: RP-151045)*

*(LTE\_CA\_enh\_b5C-Core, leading WG: RAN1, REL-13; started: Dec. 14, closed: Dec. 15, WID: RP-151984)*

*(LTE\_SC\_PTM-Core, leading WG: RAN2, REL-13; started: June 15, closed: Dec. 15, WID: RP-151110)*

*(LTE\_eD2D\_Prox-Core, leading WG: RAN2, REL-13; started: Dec. 14, closed: Mar. 16, WID: RP-150441)*

*(LTE\_MC\_load-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: RP-152181)*

*(LTE\_dualC\_enh-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: RP-151739)*

*(LTE\_extDRX-Core; leading WG: RAN2; started: Mar. 15; closed: Mar. 16; WID: RP-150493)*

*(LTE\_EBF\_FDMIMO-Core; leading WG: RAN1; started: June. 15; closed: Dec. 15; WID: RP-151085)*

*(LTE\_eMDT2-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: RP-151611)*

*(UTRA\_LTE\_iPos\_enh-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: RP-152251)*

*(LTE\_WLAN\_radio-Core, leading WG: RAN2, started: Mar. 15, closed: Mar. 16, WID: RP-152213)*

*(LTE\_WLAN\_radio\_legacy-Core; leading WG: RAN2; started: Sep. 15; closed: Mar 15; WID: RP-151615)*

*Including any LTE corrections related to the following joint UMTS/LTE WIs:*



(ACDC-RAN-Core; leading WG: RAN2; REL-13; started: Mar. 15; closed: Dec. 15; RP-150662)

Including output from email discussion [99#19][LTE/CA] Unnecessary mandatory IE in UE capability signalling (Intel)

- R2-1711444 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm Incorporated CR Rel-13 36.331 13.7.0 3106 - F LTE\_SC\_PTM-Core  
 - Ericsson thinks that the SC-PTM is part of MBMS, so the MBMS sentence should apply to SC-PTM.  
 - Nokia suggest to add that SC-PTM counts as a MBMS service.  
 => The CR is revised in R2-1711847
- R2-1711847 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm Incorporated CR Rel-13 36.331 13.7.0 3106 1 F LTE\_SC\_PTM-Core  
 [CB #301]
- R2-1711453 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3108 - A LTE\_SC\_PTM-Core  
 => Not treated
- R2-1711467 Clarification on csi-RS-ConfigNZPId Qualcomm Korea CR Rel-13 36.331 13.7.0 3111 - F LTE\_EBF\_FDMIMO-Core  
 - Ericsson explains that you need to use both *CSI-RS-ConfigNZPId-r11* and rel-13 to get a total of 8 resources.  
 => The CR is postponed
- R2-1711471 Clarification on csi-RS-ConfigNZPId Qualcomm Korea CR Rel-14 36.331 14.4.0 3112 - A LTE\_EBF\_FDMIMO-Core  
 => Not treated
- R2-1711621 Discussion on SFN mismatch issue NTT DOCOMO INC. discussion LTE\_extDRX-Core  
 - MediaTek think this is an issue to be addressed. Huawei also agree.  
 - Qualcomm think this is an issue but should be addressed by UE implementation as agreed before.  
 - Qualcomm think for solution 3 the flag must remain set for the eDRX period. Wonders what happens if there is another reset while the flag is set.  
 - Samsung prefer to stay with the agreement from last time to rely on UE implementation.  
 - DOCOMO think if it is left to implementation then operator cannot control this issue.  
 - MediaTek think there needs to be something in UE to reacquire MIB regularly and a really aggressive UE that doesn't acquire MIB could have problems.  
 => Capture the problem in the specification and that UE implementations are expected to handle it in some way. Wording and spec in which it is captured to be progressed offline. Offline discussion #02 (DOCOMO)
- R2-1712002 SFN desynchronizaion between eNB and eDRX UE NTT DOCOMO, INC. CR Rel-14 36.331 3126 F LTE\_extDRX-Core  
 => Agreed in principle
- R2-1711671 Paging failure for CE mode capable UE NTT DOCOMO INC. discussion TEI13  
 - Nokia do not understand the exact problem as the network can get the UE capabilities when the TAU is performed.  
 - DOCOMO think there is a problem when TAU is implemented without active flag and so eNB doesn't receive initial context setup request.  
 - Qualcomm think the problem is only for UEs that don't support CE mode B. Think the network based approach means that eNB will have to request capabilities for all UEs that don't support CE mode B. For CE mode B there is a flag in the Connection Setup Complete that is already provided to the MME can be used by the network

- LG think there is no need for a UE based solution. Don't see why MME can no request the UE capability from those UEs that might have a problem.
  - Ericsson agree with the Qualcomm explanation. Think it is a benefit to transfer the UE capabilities at the TAU as it then avoids the need to transfer the UE capabilities in the case of service request later.
  - Huawei think that the network solution is anyway needed to solve the legacy UEs and the UE solution is a possible optimisation on top.
- => RAN2 see that a network based solution is required.  
=> Offline discussion whether a UE based solution is also feasible and beneficial (Offline discussion #03, Qualcomm)  
=> Draft LS in R2-1711875 (Qualcomm)

R2-1711875 [DRAFT] Reply LS on Paging failure for CE capable UEs Qualcomm IncorporatedLS out Rel-13 LTE\_feMTC-Core  
=> WI code changed to TEI13  
=> Approved in R2-1712064  
=> MCC: Wrong release in the header, release should be Rel-13  
=> Approved in R2-1712067

R2-1711281 UL CA IDC clarification Nokia, Nokia Shanghai Bell discussion SPIA\_IDC\_LTE-Core  
*moved from 6 to 7.3*

R2-1711282 Correction to UL CA IDC problem signalling Nokia, Nokia Shanghai Bell CR Rel-13 36.331 13.7.0 3102 - F SPIA\_IDC\_LTE-Core  
*moved from 6 to 7.3*

R2-1711283 Correction to UL CA IDC problem signalling Nokia, Nokia Shanghai Bell CR Rel-14 36.331 14.4.0 3103 - A SPIA\_IDC\_LTE-Core  
*moved from 6 to 7.3*

## 8 LTE Rel-14

### 8.1 WI: Enhanced LAA for LTE

(LTE\_eLAA-Core; leading WG: RAN1; REL-14; started: Dec. 15; closed: Mar. 17; WID:RP-162229)

*This agenda item is for correction CRs to the closed WI.*

*Documents in this agenda item will be handled in a break out session*

R2-1711662 Correction to eLAA reconfiguration HTC Corporation CR Rel-14 36.331 14.4.0 3121 - F LTE\_eLAA-Core

- Huawei and Nokia don't think this is a problem as this is a choice IE, you can configure either one or the other. If the UE gets a new configuration it will release the previous field.
- => The CR is not pursued

### 8.2 WI: Support for V2V services based on LTE sidelink

(LTE\_SL\_V2V-Core; leading WG: RAN1; started: Dec. 15; closed: Sept 16; WID: RP-161603)

*This agenda item is for correction CRs to the closed WI.*

*Documents in this agenda item will be handled in a break out session*

## 8.2.1 User plane

## 8.2.2 Control plane

## 8.3 Void

## 8.4 Void

## 8.5 WI: Enhanced LTE-WLAN Aggregation (eLWA)

(LTE\_WLAN\_aggr-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Mar. 17; WID: RP-160923)

This agenda item is for correction CRs to the closed WI.

## 8.6 WI: Further mobility enhancements in LTE

(LTE\_eMob-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Mar. 17; WID:RP-162503)

This agenda item is for correction CRs to the closed WI

*Documents in this agenda item will be handled in a break out session*

## 8.7 WI: Further Indoor Positioning enhancements for UTRA and LTE

(UTRA\_LTE\_iPos\_enh2-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Dec. 16; WID: RP-162026)

This agenda item is for correction CRs to the closed WI

*Documents in this agenda item will be handled in a break out session*

## 8.8 WI: L2 latency reduction techniques for LTE

(LTE\_LATRED\_L2-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Sep. 16; WID: RP-160667)

This agenda item is for correction CRs to the closed WI

*Documents in this agenda item will be handled in a break out session*

## 8.9 Void

## 8.10 WI: eMBMS enhancements for LTE

(MBMS\_LTE\_enh2-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Sep. 17; WID:RP-162231)

This agenda item is for correction CRs to the closed WI

*Documents in this agenda item will be handled in a break out session*

R2-1710038 LS on MBSFN RSRP/RSRQ measurement mapping for FeMBMS (R4-1708663; contact: Qualcomm) RAN4 LS in Rel-14 MBMS\_LTE\_enh2-Core To:RAN2, RAN4  
=> Noted

R2-1711611 MBSFN RSRP/RSRQ measurement mapping for FeMBMS Qualcomm Incorporated CR  
Rel-14 36.331 14.4.0 3118 - F MBMS\_LTE\_enh2-Core  
=> The CR is in principle agreed.

R2-1711617 Reference Signals for MBSFN with 1.25kHz and 7.5kHz sub-carrier spacing Qualcomm Incorporated CR Rel-14 36.300 14.4.0 1069 - F MBMS\_LTE\_enh2-Core

- Nokia think it is RAN1 issue.
- => The CR is in principle agreed.
- ☞ **CB:** => Draft reply LS in R2-1711944 to RAN1 to indicate our in principle agreed CR. (Offline discussion#100 Qualcomm)

## 8.11 WI: Enhancements of NB-IoT

(NB\_IOTenh-Core; leading WG: RAN1; REL-14; started: June 16; closed: Jun. 17; WID: RP-171060)

This agenda item is for correction CRs to the closed WI

Note: SC-PTM for eNB-IoT is handled under 8.12.1

*Documents in this agenda item will be handled in a break out session*

### Incoming LS

- R2-1710064 Reply LS on Solution 9 (Option 2) for CN overload control for CP data (S2-176130; contact: Qualcomm) SA2 LS in Rel-14 Clot\_Ext To:RAN4, RAN2 Cc:RAN1, RAN3
- QC think that this means that R2 doesn't have to do anything.
  - LG think we need a new explicit indication for CP data.
  - Ericsson think we have discussed this previously, and that we have already accepted the use of the current cause values
- ⇒ **Based on this LS, R2 understands that there is thus no RRC impact in Rel-14.**
- ⇒ **Noted**

### Interference Randomisation

- R2-1710733 Interference Randomisation in NB-IoT Ericsson discussion Rel-14 NB\_IOTenh-Core
- ⇒ **noted**
- R2-1710734 Clarification on Interference Randomisation in NB-IoT in 36.331 Ericsson, Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3090 - F NB\_IOTenh-Core
- Huawei are ok to have the clarification, but would prefer to write it more compact.
- ⇒ **Revised in R2-1711879 (rev 1), to update the wording.**
- Comeback.
- R2-1711879 Clarification on Interference Randomisation in NB-IoT in 36.331 Ericsson, Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3090 1 F NB\_IOTenh-Core
- Intel wonders why there is double references. Huawei and Ericsson think this is deliberate and was discussed offline. QC think the text is ok.
- ⇒ **Agreed in principle**

### RAI

- R2-1710747 Open issue RAI Ericsson discussion Rel-14 NB\_IOTenh-Core
- LG have a similar understanding but think that upper layer should indicate whether there is more data in the near future or not.
  - Nokia want to point out that if we don't specify this, the behaviour is unspecific, and it may be difficult to introduce it.
  - Huawei support the proposal from Ericsson, and think the NAS RAI works well without stringent specification. QC agrees we should just remove the FFS. Gemalto agrees.
- ⇒ **noted**
- R2-1710748 Removal of FFS for RAI in 36.321 Ericsson CR Rel-14 36.321 14.4.0 1186 - F NB\_IOTenh-Core

- ⇒ **Cat should be F**
- ⇒ **Impact analysis should be added, could slightly enhance the consequences if not approved.**
- ⇒ **Agreed in principle with changes above, revision provided at next meeting.**

### 36.321

R2-1711335 Clarification on carrier index in PDCCH order Huawei, HiSilicon CR Rel-14  
36.321 14.4.0 1188 - F NB\_IOTenh-Core

- Ericsson agrees this should be clarified.
- Ericsson wonders if the value 0 also determines a different behaviour.
- QC think that the “and” in the middle should be “otherwise”.

Offline discussion 201 (Huawei), to clarify the details, Revision in R2-1711883

R2-1711883 Clarification on carrier index in PDCCH order Huawei, HiSilicon CR Rel-14  
36.321 14.4.0 1188 1 F NB\_IOTenh-Core

- Ericsson support that this shall be clarified but think this should be done in 36.213. Ericsson think that in general R1 information should be clarified in R1 TS. LG also think this is better in R1 spec, except the last correction which is a MAC correction.
- Huawei think it fits in MAC as we have the similar wording on subcarrier selection in MAC. ZTE agrees with Huawei.

⇒ **This shall be clarified, either in R1 or R2 TS.**

⇒ **postponed**

### 36.331

R2-1711472 Correction to UE-Capability-NB extension Sequans Communications CR Rel-14  
36.331 14.4.0 3113 - F NB\_IOTenh-Core

⇒ Revised in R2-1711830

R2-1711830 Correction to UE-Capability-NB extension Sequans Communications CR Rel-14  
36.331 14.4.0 3113 1 F NB\_IOTenh-Core

- Nokia agrees this need to be fixed but would prefer to continue discussion offline. Huawei also agrees there is a problem, but think there are even further problems.

⇒ **CR is postponed**

⇒ **We shall fix this at the next meeting.**

☒ **[99bis#33][NB-IoT R14] UE-Capability-NB extension (Sequans)**

- Intended outcome: Agreeable CR
- Deadline: Thursday 2017-11-09

## 8.12 WI: Further Enhanced MTC for LTE

*(LTE\_feMTC-Core; leading WG: RAN1; REL-14; started: June 16; closed: Jun. 17; WID: RP-170532)*

*This agenda item is for correction CRs to the closed WI*

*Documents in this agenda item will be handled in a break out session*

### 8.12.1 Multicast for feMTC and eNB-IoT

R2-1711224 Correction on downlink reception type combination for SC-PTM in feMTC Huawei, HiSilicon CR Rel-14 36.302 14.3.0 0115 - F LTE\_feMTC-Core

- LG think the new combination should be “D1 or H1 or (D1+H1)” rather than just D1+H1. Blackberry think that the LG suggestion would mean that we interpret or as xor, which makes it complex and suggests to stick to the proposal.

Offline discussion 202 (Huawei) on the details. Revision in R2-1711884

R2-1711884 Correction on downlink reception type combination for SC-PTM in feMTC Huawei, HiSilicon  
CR Rel-14 36.302 14.3.0 0115 - F LTE\_feMTC-Core

⇒ **Agreed in principle**

R2-1711226 Correction on TS 36.331 for feMTC and NB-IoT Huawei, HiSilicon CR Rel-14  
36.331 14.4.0 3094 - F LTE\_feMTC-Core, NB\_IOTenh-Core  
- Ericsson think that for the first change, there is another place to do the update (in the ASN.1),  
Second change, agrees in principle, but the current text is not broken. Third change: not  
crystal clear that this is needed but if so have some suggested modifications.

Offline discussion 203 (Huawei) on the details. Revision in R2-1711885

R2-1711885 Correction on TS 36.331 for feMTC and NB-IoT Huawei, HiSilicon CR Rel-14  
36.331 14.4.0 3094 - F LTE\_feMTC-Core, NB\_IOTenh-Core  
- Huawei think that the second change can be removed, and that NB-IoT then can be removed  
from the WI code.  
- In the third change, QC think that the current text works ok. QC think that only the missing “s”  
is a needed correction.

⇒ **Not pursued**

R2-1711473 Clarification on srs-UpPtsAdd in SRS coverage enhancement Intel Corporation CR  
Rel-14 36.331 14.4.0 3114 - F LTE\_feMTC-Core  
- Ericsson wonders if R1 will send an LS or not. Intel is not aware of any R1 discussion on this.  
Ericsson would like to check.  
- Intel think that for the first change we could wait and check. The second change is mainly  
intended as a clarification.  
- Ericsson think that the first change should be treated in the main session. Intel agrees.

Comeback, allow offline check.

- Intel has checked offline, but think more time is needed

⇒ **postponed**

## 8.12.2 Other

### Skip MIB at Handover

R2-1711464 Target cell optional PBCH repetition status indication Qualcomm Incorporated CR Rel-  
14 36.331 14.4.0 3037 - F LTE\_feMTC-Core R2-1709289

*The above tdoc moved to 8.12 from 7.1*

- Huawei think only one bit is needed, and that sameSFN-indication should be interpreted as  
“no need to read MIB in the target”. Ericsson think there could be benefits with separate  
indications.
- Intel think it would be best to have different bits as proposed by QC.
- Huawei think that the CR is not backwards compatible.

⇒ **Agree that target cell PBCH repetition status need to be known by the UE in order to avoid  
reading MIB in the target cell.**

⇒ **Agree to have this kind of change, review and improve details in the CR**

Offline 208, revision in R2-1711889.

- R2-1711889 Target cell optional PBCH repetition status indication Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3037 2 F LTE\_feMTC-Core R2-1709289
- Huawei think that the IE is only applicable when SameSFN is indicated, and the purpose shall be only if the UE need to read MIB or not. LG Agrees
  - Huawei think that the new IE should be included only if the configuration of the Src and Target are different.
  - Ericsson think that we already agreed that the indications can be independent and think the indications as proposed by QC makes sense.
  - QC think that in addition to skip MIB or not, the IE helps the UE in the MIB decoding process.
- ⇒ **Agreed in principle**

- R2-1711840 Scheduling information of SIB1-BR when skipping MIB during HO Intel Corporation CR Rel-14 36.331 14.4.0 3122 - F LTE\_feMTC-Core
- It seems that scheduling information for SIB1-BR is needed as well, to avoid reading MIB in the target cell. Huawei agrees this could be useful, but think that the CR need modifications.
- ⇒ **Agree to have this kind of change, review and improve details in the CR.**

Offline discussion 207, revision in R2-1711888

- R2-1711888 Scheduling information of SIB1-BR when skipping MIB during HO Intel Corporation CR Rel-14 36.331 14.4.0 3122 - F LTE\_feMTC-Core
- QC think that the field description needs improvement, the MIB IE text should be used.
  - intel and QC think that there is a need for RAN1 CRs as well, as it seems the referenced tables are only applicable to Rel-13 IEs for the moment.
- Revised in R2-1711893

- R2-1711893 Scheduling information of SIB1-BR when skipping MIB during HO Intel Corporation CR Rel-14 36.331 14.4.0 3122 - F LTE\_feMTC-Core
- Huawei want to check this. QC think this is now OK and there is no longer any interop issue.
  - The CR seems agreeable to most companies. Huawei think it may indeed be problematic.
- ⇒ **Postpone (will not have long discussions on this next meeting)**

### 36.331

- R2-1710893 Extension of mac-ContentionResolutionTimer for FeMTC Nokia, Nokia Shanghai Bell CR Rel-14 36.331 14.4.0 3089 - F LTE\_feMTC-Core
- LG think this is very unlikely. The eNB should not use the problematic configurations in the access procedure. Nokia think that large number of repetitions for MPDCCH is needed. LG think that the contents of both MPDCCH and PDSCH is small. Huawei agrees this is at least a problem in principle but think we could resolve it by just make the timer applicable to start reception etc. Nokia think this would bring a lot of change. Ericsson are not sure whether anything is needed.
- Comeback Friday, to check if agreement is possible or if to postpone to next meeting.
- After offline Nokia still think there is an issue as in the procedure text the contention res timer applies to both PDCCH and PDSCH transmission. Huawei think we need to postpone
- ⇒ **postponed**

### 36.321

- R2-1711362 Correction of reference for kPHICH value Ericsson India Private Limited CR Rel-14 36.321 14.4.0 1189 - F LTE\_feMTC-Core
- LG suggests to make it simpler and just remove the reference to the table.
  - Huawei think this should be treated in the main session.
- ⇒ **Moved to main session**
- ⇒ WI code should be TEI14
- ⇒ **Agreed in principle**

- R2-1711225 Minor correction on the IE of pusch-EnhancementsConfig in feMTC Huawei, HiSilicon  
 CR Rel-14 36.321 14.4.0 1187 - F LTE\_MTCe2\_L1-Core  
 - Ericsson think the box for ME should be ticked on the cover page.  
 => **Agreed in principle with the cover sheet update, revision at next meeting.**

### 36.300

- R2-1711227 Correction on TS 36.300 for feMTC Huawei, HiSilicon CR Rel-14 36.300  
 14.4.0 1066 - F LTE\_MTCe2\_L1-Core  
 - LG supports this CR  
 => **Agreed in principle**

### 36.355

- R2-1711228 Discussion on the correction in TS 36.355 for feMTC Huawei, HiSilicon discussion  
 Rel-14 LTE\_MTCe2\_L1-Core  
 - QC agrees this has to be fixed and would prefer option 1.  
 - Intel also agrees with option 1 and can also accept option 3.  
 - LG also support option 1.  
 - Chair think that we need to somehow indicate non-compatibility, e.g. by the 3GPP www.  
 Ericsson agrees.  
 => **Agree to use option 1 (non-backwards compatible ASN.1)**

- R2-1711229 Corrections on TS 36.355 for feMTC Huawei, HiSilicon CR Rel-14 36.355  
 14.3.0 0187 - F LTE\_MTCe2\_L1-Core  
 => **revision for next meeting.**

## 8.13 WI: LTE-based V2X Services

*(LTE\_V2X-Core, leading WG: RAN1; REL-14; started: June 16; closed: Mar. 17; WID: RP-162519)*

*This agenda item is for correction CRs to the closed WI*

*Documents in this agenda item will be handled in a break out session*

- R2-1710063 Reply LS on mapping between service types and V2X frequencies (S2-174064; contact: Huawei)  
 SA2 LS in Rel-14 V2XARC To:RAN2, CT1  
 => Noted

### 8.13.1 Stage 2

- R2-1710098 Corrections to V2X in TS 36.300 Huawei, HiSilicon CR Rel-14 36.300 14.4.0 1062  
 - F LTE\_V2X-Core  
 => Update the description to clarify "If the UE is authorized for V2X sidelink communication is in-coverage for V2X sidelink communication or the eNB provides V2X configuration for the concerned frequency"  
 => correct typo on last clause affected " 23.14.1.2"  
 => add "V2X" before sidelink communications  
 => Capture the "Multiple SPS configurations can be utilized only by UEs capable of V2X communication, regardless of the specific LTE service they are operating." in the more general SPS section. It should be clear that it can only be supported by UE capable V2X  
 - Oppo thinks that in discovery we distinguish between reception and transmission but in V2X we have one section. And we should prevent the case where the UE acquires SIB21 in other frequency for reception only, but that includes that tx resources as well.



- => Revisit the section inter-PLMN behaviour for reception. Companies need to think about this more.
  - => updated sentence “ The P-UE can send Sidelink UE Information message to indicate that it requests resource pools for transmission of V2X sidelink communications and indicate that it is P-UE” other option “for P2X related sidelink communications”
  - => Need to somehow clarify that the SPS framework for V2X is based on legacy LTE SPS, either reference to SPS section or add some text.
  - => The CR is revised in R2-1711853
- R2-1711853 Corrections to V2X in TS 36.300 Huawei, HiSilicon CR R2-1710098 Rel-14  
 36.300 14.4.0 LTE\_V2X-Core 1062 F
- => The “shall” is changed to “the UE uses the scheduled”
  - => The CR is agreed in principle in R2-1711859 with the change above
- R2-1710099 Correction to V2X descriptions in TS 36.302 Huawei, HiSilicon CR Rel-14  
 36.302 14.3.0 0114 - F LTE\_V2X-Core
- => Understand whether we need to cover the release of SPS case (i.e. similar to note 6 and 7)
  - => The CR is postponed
- R2-1711492 Clarification to Mapping Between Service Types and V2X Frequencies Ericsson CR  
 Rel-14 36.300 14.4.0 1067 - F LTE\_V2X-Core
- Qualcomm thinks that this is a bigger problem to solve than just 36.300. Huawei explains that according to the SA2 there is a way to link the service type with the frequency and destination.
  - => The CR is revised in R2-1711858
- R2-1711858 Clarification to Mapping Between Service Types and V2X Frequencies Ericsson CR  
 R2-1711492 Rel-14 36.300 14.4.0 LTE\_V2X-Core 1067 1 F
- Qualcomm thinks that for Rel-14 we can simplify it to one carrier. Ericsson thinks that it is a supported feature in stage 3.
  - Oppo thinks we need to consider the default address.
  - => Update description for mapping of destination and associated frequencies
  - => The CR is postponed

### 8.13.2 User plane

- R2-1711687 Corrections to V2X functionality LG Electronics Inc. CR Rel-14 36.321 14.4.0 1190  
 - F LTE\_V2X-Core
- => Delete “by upper layers” in the notes where “or transmission of V2X sidelink communication is prioritized” occurs
  - => Delete “SPS configuration index *sps-ConfigIndex*”
  - On the non-overlapping configuration*
  - Ericsson and Nokia don’t think that we should have “whether the UE transmits”. Oppo sees no benefit for the UE to transmit. Qualcomm agrees with Oppo, and this is a mis-configuration case that the network should avoid. Ericsson doesn’t think this is a bad configuration, but because of UE situation (e.g. speed) in a certain period of time. If this happens the UE will be stuck. Oppo explains that this happens in rare occasions, like fast UEs in a congested scenario.
  - => Remove “allowed parameters and if the UE transmit”. Capture from which transmitting parameters configuration set the UE uses (i.e. pssch-TxConfigList or cbr-pssch-TxConfigList) instead of which transmitting parameters.
  - => Find a way to properly define when “transmission of V2X sidelink communication is prioritized”. Then whenever we speak for “transmission of V2X sidelink communication is prioritized” then we can refer to the definition.
  - => Last change “remove colon”
  - => Update impact analysis
  - => The CR is revised in R2-1711852
- R2-1711852 Corrections to V2X functionality LG Electronics Inc. CR R2-1711687  
 Rel-14 36.321 14.4.0
- => In 5.4.1 we should delete except grant for Msg3 as the section is for SPS

- => Add impact analysis for UE to UE
- => Moved to email discussion

- ☒ **[99bis#46][LTE/V2X] CR to 36.321 (LG)**
- Intended outcome: Agreeable CR to next meeting
- Deadline: Thursday 2017-11-09

### 8.13.3 Control plane

- R2-1710100 Correction to Inter-frequency reception for V2X sidelink communication Huawei, HiSilicon  
 CR Rel-14 36.331 14.4.0 3072 - F LTE\_V2X-Core
- Qualcomm asks why dedicated pool is there. Huawei explains that it was added in an email discussion CR without much discussion.
  - Nokia wonders if the reception pool provided by SIB and by dedicated can be different. LG thinks that if the reception pool is not the union of all tx pool then data traffic can be missed.
  - ZTE indicates that it was agreed in previous meeting to provide both rx and tx.
- => Remove the option for rx pool to be configured via dedicated signalling, unless there is backward compatibility issue. This can be indicated in the field description.
- R2-1710153 CR on SIB21 reading OPPO, Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3073  
 - F LTE\_V2X-Core
- => the CR is revised R2-1711857
- R2-1711857 CR on SIB21 reading OPPO, Qualcomm Incorporated CR R2-1710153 Rel-14  
 36.331 14.4.0 LTE\_V2X-Core 3073 F
- => The impact analysis needs to be added  
 => The CR is agreed in principle R2-1711860 with impact analysis added
- R2-1710686 Transmission of P2X sidelink communication in Exceptional Pool Qualcomm Incorporated CR  
 Rel-14 36.331 14.4.0 3084 - F LTE\_V2X-Core
- => The CR is not treated
- R2-1710687 Correction on SubframeBitmap Configuration in Band 47 Qualcomm Incorporated CR Rel-14  
 36.331 14.4.0 3085 - F LTE\_V2X-Core
- => Impact analysis needs to be added  
 => Discuss the need for the CR  
 => The CR is revised in R2-1711848
- R2-1711848 Correction on SubframeBitmap Configuration in Band 47 Qualcomm Incorporated CR  
 Agreement R2-1710687 Rel-14 36.331 14.4.0 LTE\_V2X-Core 3085 F
- => The CR is agreed in principle
- R2-1710688 UE behavior for using LTE\_V2X-Core provisioned ITS carrier Qualcomm Incorporated discussion  
 LTE\_V2X-Core
- => Not treated
- R2-1710689 Correction on transmission of V2X sidelink communication in provisioned frequency  
 Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3086 - F LTE\_V2X-Core
- => Not treated
- R2-1711448 Correction to UE capabilities Nokia, Nokia Shanghai Bell CR Rel-14 36.331  
 14.4.0 3107 - F LTE\_V2X-Core
- => Updated to first entry instead of first band  
 => The CR is revised in R2-1711854
- R2-1711854 Correction to UE capabilities Nokia, Nokia Shanghai Bell CR R2-1711448 Rel-14  
 36.331 14.4.0 LTE\_V2X-Core 3107 F
- => The CR is in principle agreed

## 8.14 WI: SRS switching between LTE component carriers

(LTE\_SRS\_switch; leading WG: RAN1; REL-14; started: Mar.16; closed: Dec. 16; WID: RP-160935)

This agenda item is for correction CRs to the closed WI

*Documents in this agenda item will be handled in a break out session*

R2-1710891 Correction on SRS switching capabilities field description Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3088 - F LTE\_SRS\_switch  
=> The CR is in principle agreed

## 8.15 WI: Measurement Gap Enhancement for LTE

(LTE\_meas\_gap\_enh-Core; leading WG: RAN4; REL-14; started: Mar. 16; closed: Jun. 17; WID: RP-160912)

This agenda item is for correction CRs to the closed WI

R2-1711466 Signaling of NCSG Support for Inter-F Measurement Qualcomm Korea CR Rel-14 36.331 14.4.0 3110 - B LTE\_meas\_gap\_enh-Core  
- Nokia thinks that we don't add "supporting *perServingCellMeasurementGap-r14*" especially for forward compatibility.  
- Ericsson thinks that we need to review the capability as the capability is per CC but we are extending it to single carrier case.  
=> The CR is postponed

## 8.16 Void

## 8.17 WI: Performance enhancements for high speed scenario in LTE

(LTE\_high\_speed-Core; leading WG: RAN4; REL-14; started: Dec. 15. 16; closed: Dec. 16; WID: RP-160172)

This agenda item is for correction CRs to the closed WI

*Documents in this agenda item will be handled in a break out session*

## 8.18 WI: Voice and Video enhancement for LTE

(LTE\_VoLTE\_ViLTE\_enh; leading WG: RAN2; REL-14; started: Sep. 16; closed: Mar. 17; WID: RP-161856)

This agenda item is for correction CRs to the closed WI.

*Documents in this agenda item will be handled in a break out session*

## 8.19 New UE category with single receiver based on Category 1 for LTE

(LTE\_UE\_cat\_1Rx-Core; leading WG: RAN4; REL-14; started: Sep. 16; closed: Jun. 17; WID: RP-171149)

This agenda item is for correction CRs to the closed WI.

*Documents in this agenda item will be handled in a break out session*

## 8.20 Uplink Capacity Enhancements for LTE

LTE\_UL\_CAP\_enh-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Mar. 17; WID: RP-162488

*This agenda item is for correction CRs to the closed WI.*

*Documents in this agenda item will be handled in a break out session*

## 8.21 WI: Enhancements on Full-Dimension (FD) MIMO for LTE

*(LTE\_eFD\_MIMO-Core; leading WG: RAN1; REL-14; started: Mar. 2016; closed: Mar. 17: WID: RP-160623)*

*This agenda item is for correction CRs to the closed WI.*

*Documents in this agenda item will be handled in a break out session*

- R2-1710041 Reply LS reply on TM10 / FD-MIMO UE capability signalling (R4-1708730; contact: Intel) RAN4  
LS in Rel-14 LTE\_EBF\_FDMIMO-Core To:RAN2 Cc:RAN1  
=> Wait for RAN4 to complete the discussions  
=> Noted

## 8.22 Void

## 8.23 WI: Downlink Multiuser Superposition Transmission for LTE

*(LTE\_MUST-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Dec. 16: WID: RP-161019)*

*This agenda item is for correction CRs to the closed WI*

*Documents in this agenda item will be handled in a break out session*

- R2-1710040 Reply LS on LTE Rel-14 UE feature list for MUST (R4-1708704; contact: MediaTek) RAN4  
LS in Rel-14 LTE\_MUST To:RAN2 Cc:RAN1  
=> Noted

- R2-1710986 MUST capability MediaTek Inc. CR Rel-14 36.331 14.4.0 3091 - F  
LTE\_MUST-Core  
- Intel understood that it is for every band per band combination and not just per band combination.  
- Nokia thinks another way to capture it to have 5 different bits with the corresponding name.  
=> Add impact analysis  
=> Need to create 36.306  
=> The CR is postponed

## 8.24 Other LTE Rel-14 WIs

*This agenda item may be used for documents relating to Rel-14 WIs with no allocated RAN2 time but which might have minor RAN2 impact.*

*Including any LTE corrections related to the following joint UMTS/LTE WI:*

*(eDECOR-UTRA\_LTE-Core; leading WG: RAN3; REL-14; started: Dec. 16; closed: Mar. 17: WID: RP-162543)*

- R2-1711512 UE capability, retrieval of fallback combinations Samsung Telecommunications CR Rel-14 36.331 14.4.0 3117 - F LTE\_CA\_enh\_b5C-Core, TE114  
- Nokia thinks that even without the CR the assumption is that the indicated CA combinations are supported  
- Ericsson asks if the use case is when the UE provides the CA combination without knowing the UE capability. Samsung explains that is the case. Nokia understood that the network wouldn't initiate without knowing the UE capabilities.  
- Ericsson thinks that we normally wouldn't configure the UE with things it doesn't support but maybe in this case it may happen.  
[CB – if there is a possibility for this problem to happen and if a clarification is needed  
[CB #302]

## 8.25 LTE TEI14 enhancements

*Small Technical Enhancements affecting LTE Rel-14 that do not belong to any Rel-14 WI.*

*Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!*

*This agenda item is for items already discussed under TEI14. New proposals should be submitted to TEI15 which is planned to be included on the agenda from RAN2#100.*

*Including output from email discussion [99#20][LTE/TEI14] Overheating (Huawei)*

*Including output from email discussion [99#21][LTE/TEI14] CQI-ReportConfig (Nokia)*

### Overheating

R2-1710559 Report of email discussion [99#20][LTE/TEI14] Overheating Huawei discussion Rel-14 TEI14

#### Agreements:

1: The UE provides a reduced UE category and the preferred maximum number of CCs in the request.

R2-1710555 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.300 14.4.0 1048 3 B TEI14 R2-1709908

- Ericsson also have a text proposal that would like to be considered to be merged into this CR.

=> Wording can be progress offline

=> Can discuss whether to capture the additional text from Ericsson paper.

=> Revised in R2-1711876 (Offline discussion #04)

R2-1711876 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.300 14.4.0 1048 4 B TEI14

=> Revised in R2-1712039

R2-1712039 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.300 14.4.0 1048 5 B TEI14

=> Agreed in principle

R2-1710558 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom CR Rel-14 36.331 14.4.0 2982 3 B TEI14 R2-1709910

- Nokia think the note relating to user preference is not correct. Huawei explain that the user might not want to reduce the rate and would accept the overheating.

- Nokia wonder why the network needs to be involved at all if the user can override it.

- Intel think the stage 2 spec covers this issue and the note in stage 3 is not required.

- LG think the UE category should be explicit, not an AS release. Huawei think that the UE category can be indicated by indicating a release.

=> Note in initiation section can be removed.

=> Category should be indicated as an explicit UE category

=> Wording can be further improved offline.

=> Consider what information is passed from source to target at handover

=> Can discuss the exact inhibit timer behaviour.

=> Revised in R2-1711877 (Offline discussion #04, same as for stage 2 CR)

R2-1711877 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom CR Rel-14 36.331 14.4.0 2982 4 B TEI14

- => Revised in R2-1712040
- R2-1712040 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom CR  
Rel-14 36.331 14.4.0 2982 5 B TEI14
- => Revised in R2-1712053
- R2-1712053 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom CR  
Rel-14 36.331 14.4.0 2982 6 B TEI14
- => Agreed in principle
- R2-1710556 Introduction of the UE capability for overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.306 14.4.0 1490 3 B  
TEI14 R2-1709909
- => Wording can be further improved offline.  
=> Revised in R2-1711878 (Offline discussion #04, same as for stage 2 CR)
- R2-1711878 Introduction of the UE capability for overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.306 14.4.0 1490 4 B  
TEI14
- => Agreed in principle
- R2-1711537 Remaining issues for UE overheating feature Ericsson discussion Rel-14  
TEI14
- P1
- Huawei is ok to add this text to the stage 2. Intel think that the indication is sent when the UE can't resolve the issue by itself. Ericsson think this was discussed previously and it was clear that the UE could not rely fully on the network. LG have the same view as Intel, and think the UE will not send this indication frequently. Also think UE behaviour cannot to be specified for this case.
- P2
- Huawei think this is already addressed in the CR.
  - Samsung think there are 2 parts the configuration and the indication
- => Noted
- R2-1710752 Prohibit timer for the overheating solution LG Electronics Mobile Research discussion TEI14  
R2-1708752
- => Noted
- CQI-ReportingConfig*
- R2-1710993 Restructuring of CQI-ReportConfig (email discussion 99#21) Nokia, Nokia Shanghai Bell  
CR Rel-14 36.331 14.4.0 2968 2 F TEI14 R2-1709813
- Ericsson wonder if the exercise if really essential. Shall we continue on this track. Nokia intended this as a one-time activity.
- => Remove "part of"  
=> Agreed in principle in R2-1711930
- R2-1711930 Restructuring of CQI-ReportConfig (email discussion 99#21) Nokia, Nokia Shanghai Bell  
CR Rel-14 36.331 14.4.0 2968 3 F TEI14
- => Companies are requested to carefully check this CR before the next meeting.

*Other*

- R2-1710246 Introduction of DL 2Gbps Category Qualcomm Incorporated CR Rel-14 36.331  
14.4.0 3071 - B TEI14 RP-171822
- => The CR is agreed in principle
- R2-1710247 Introduction of DL 2Gbps Category Qualcomm Incorporated CR Rel-14 36.306  
14.4.0 1508 - B TEI14 RP-171823

=> The CR is agreed in principle

- R2-1711162 Correction on the dataInactivityTimer operation LG Electronics Inc. discussion Rel-14 TEI14
- Ericsson thinks that this was introduced to solve the state mismatch and due to inactivity time the UE would also go to idle mode. The TAU procedure will fix the state mismatch problem.
  - Ericsson doesn't think that UE autonomous release was not the intention of this feature.
- => No support for these enhancements  
=> Noted
- R2-1711186 36331\_CR(3092)\_(Rel-14)\_R2-1711186\_Correction on the DataInactivityTimer operation (Option1) LG Electronics UK CR Rel-14 36.331 14.4.0 3092 - F TEI14
- => Not treated
- R2-1711206 36331\_CR(3093)\_(Rel-14)\_R2-1711206\_Correction on the DataInactivityTimer operation (Option2) LG Electronics UK CR Rel-14 36.331 14.4.0 3093 - F TEI14
- => Not treated
- R2-1711475 Clarification on LPP Message size due to limitations at the lower layers Intel Corporation CR Rel-14 36.305 14.3.0 0071 - F LCS\_LTE
- => Add impact analysis
- Nokia asks if the previous behaviour is incorrect do we need to state that the UE shouldn't implement the previous version
- => The CR is revised in R2-1711849
- R2-1711849 Clarification on LPP Message size due to limitations at the lower layers Intel Corporation CR R2-1711475 Rel-14 36.305 14.3.0 LCS\_LTE [CB #303]
- R2-1711538 BCS and fallback band combinations Ericsson discussion Rel-14 TEI14
- Intel thinks that Option 1 minimizes the size
  - Ericsson indicates that we need to update the fallback definition
- => Adopt Option 1 - BC1 is a fallback band combination of BC0. Specification changes needed will be discussed next meeting.  
=> Noted
- R2-1711559 Deliver stored PDCP SDUs for LWA bearer with RLC UM at PDCP re-establishment LG Electronics France CR Rel-14 36.323 14.4.0 0203 - F LTE\_WLAN\_aggr-Core
- => The CR is agreed in principle
- R2-1711562 Clarification on Explicit Congestion Notification (ECN) Qualcomm Incorporated CR Rel-14 36.300 14.4.0 1068 - F TEI14
- Ericsson thinks that ECN can be used for other purposes than voice. Qualcomm thinks that the study was for voice.
  - Qualcomm thinks that in current specs ECN is only used for voice and video.
- => No changes for LTE and discuss this section for NR in NR session  
=> The CR is not pursued

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## 9 LTE Rel-15

### 9.1 SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

(FS\_feD2D\_IoT\_relay\_wearable; leading WG: RAN2; REL-15; started: Mar. 16; target: Dec. 17; SID: RP-170295)

Time budget: 0.5TU

*Documents in this agenda item will be handled in a break out session*

R2-1710546 Evaluations of the assumptions from SA2 (S2-176444) Huawei, HiSilicon, Intel discussion Rel-15

Issue 1a: PC5 Signalling Protocol is re-used between eRemote-UE and eRelay-UE; i.e., PDCP is required over PC5

=> This assumption can be fulfilled with the current RAN2's conclusion

Issue 1b: The eRelay-UE's AS layer is able to differentiate packets received over PC5 from the eRemote UEs, i.e. whether it is PC5-SP, PDCP packets towards eNB for different bearers (e.g. SRBs, DRBs), and indicate such to the eNB via the Adaptation layer

- Qualcomm wonders if there is other traffic type between the UE and smart phone. Huawei agrees that it could happen that to saturated LCID and not have any of other traffic but eNB can handle te configuration.

- Qualcomm thinks that using LCID is not necessary the only way to differentiate. Intel explains that we had a discussion about having a PC5 adaptation and we didn't support it since we could use LCID.

=> This assumption can be fulfilled with the current RAN2's conclusion

*Issue: PC5 Signalling Protocol is re-used between eRemote-UE and eRelay-UE;*

=> This assumption can be fulfilled with the current RAN2's conclusion

- The eRelay-UE's PC5 AS layer is able to differentiate packets from different bearers (SRBs, DRBs) from a particular eRemote-UE;

=> This assumption can be fulfilled with the current RAN2's conclusion.

*Issue: The adaptation layer between eRelay-UE and eNB is able to differentiate bearers (SRBs, DRBs) of a particular UE and apply QoS accordingly.*

- Ericsson thinks this assumes that the eNB has to figure out the QoS.

- Huawei understands that the question is related to Uu part and not end-to-end

=> The adaptation layer between eRelay-UE and eNB is able to differentiate bearers (SRBs, DRBs) of a particular UE. The associated QoS between eRelay and eNB can be applied. QoS on PC5 will be discussed further during Work Item phase.

=> Capture this in the TR

*Issue: For direct to indirect UE-initiated path switch request the eNB allows HO triggered by an RRC message from the eRemote-UE.*

- Nokia and OPPO consider that only Option 1 aligns with SA assumptions. Oppo notes that this is only from direct to indirect.

- LG thinks that Option 2 is also aligned as the eNB would still configure the UE. It is just the timing that is different. Ericsson thinks that option 2 should still be studied.

- Sony and Nokia think that we should downscope to Option 1.

=> RAN2 clarifies that we studied two options 2. At least Option 1 fulfills the criteria and for Option 2 some companies think it does. Further study is needed to confirm. RAN2 confirms to SA2 that a Option that fulfils SA2 criteria will be chosen at the end.

=> Companies can bring contribution to analyse Option 2 next meeting.

*Issue: For handover of eRelay-UE with eRemote-UE(s), the eNB handles the handover signalling of the eRelay-UE and eRemote-UE independently. The eNB ensures the handover signalling of the eRemote-UE is handled before the eRelay-UE signalling.*

- Nokia thinks that we should change the conclusion in the TR and leave group handover. Huawei and Sony thinks we can live with the downscoping. Ericsson thought group handover was a godo optimizations.

=> RAN2 can confirm this assumption in case there is no group handover optimisation.

=> Conclusion in TR is updated to state that group handover optimizations are not considered as necessary. The no group handover optimization align with SA2 assumption.

*Issue: The eNB is able to handle measurement reports in all scenarios including when eRM-UE is out of coverage of the eNB and when the eRM-UE is under the coverage of another cell.*

- ZTE thinks we should clarify that RAN2 has prioritized the case that both the remote UE and relay UE are in the coverage of a the same cell. Oppo thought that the context has to be in the same eNB not the coverage. Sony understands that this is possible.

=> This assumption can be fulfilled

*Issue: The DRX feature on PC5 is used to forward Uu paging messages*

=> This assumption can be fulfilled



*Issue: Forwarding of relevant SIB information and synchronization signals are used by the eRemote-UE in idle mode.*

=> This assumption can be fulfilled

*Issue: Paging messages forwarded on PC5 is performed after but in conjunction with the eRemote-UE PO on Uu.*

- Nokia indicates that SA2 indicated a clear preference for Option 2 so we should downscope  
=> This assumption can be fulfilled, but details of the scheme and exact time will be discussed in a work item phase. Option 2 is downselected, and the conclusion in the TR will be updated.

*Issue: Multiple priority bearers are multiplexed over the same eRelay-UE's DRB.*

=> Multiple bearers can be multiplexed over the same eRelay-UE's DRB. DRB to bearer mapping is up to eNB implementation.

*Issue: The access stratum layer between eRelay-UE and eRemote-UE is able to provide priority treatment for the emergency and eMPS bearers.*

- Nokia thinks that this is also related to QoS

=> This can be also related to QoS on PC5. QoS on PC5 will be discussed further during Work Item phase

=> Noted

R2-1711692	Consideration on key issues from SA2 FS_feD2D_IoT_relay_wearable	LG Electronics Inc.	discussion	Rel-15
	=> Noted			
R2-1711449	Discussion on SA2 assumptions FS_feD2D_IoT_relay_wearable	Nokia, Nokia Shanghai Bell	discussion	Rel-15
	=> Noted			
R2-1711017	Discussion on SA2 assumption of feD2D FS_feD2D_IoT_relay_wearable	ZTE Corporation	discussion	
	=> Not treated			
R2-1710550	Why Is PC5 PDCP Missing from L2 Relaying Radio Protocol Stack? discussion	Rel-15	FS_feD2D_IoT_relay_wearable	Huawei, HiSilicon
	=> Not treated			
R2-1710547	Clarification that bearers are distinguished by LCID on PC5 Rel-15 36.746 15.0.0 0001 - F	FS_feD2D_IoT_relay_wearable	Huawei, HiSilicon	CR
	=> The changes are agreed and will be merged in R2-1711850			
R2-1710548	DRAFT Reply LS on FS_REAR study outcome FS_feD2D_IoT_relay_wearable	Huawei	discussion	Rel-15
	=> The LS is revised in R2-1711851			
R2-1711851	DRAFT Reply LS on FS_REAR study outcome	Huawei	discussion	Decision R2-1710548
	=> Change in key issue #5 change to "RAN2 <u>intends to</u> select a path switch solution that complies with the SA2 assumptions"			
	=> Further discussion is needed to confirm if Option 2 also meets the assumptions when applied to the change from direct to indirect communication.			
	=> The LS is approved in R2-1711861 with the changes above			
R2-1710549	Introduction of PDCP in layer 2 relaying protocol stacks 15 36.746 15.0.0 0002 - F	FS_feD2D_IoT_relay_wearable	Huawei, HiSilicon	CR Rel-15
	- Intel and LG think that there is no need for a change			
	=> There is not need to have change the figures and add PDCP. Rel-13 protocol stack for PC5-S is assumed.			
	=> Add a note to indicate that PC5-S is supported using the existing/legacy protocol stack.			
	=> the CR is revised in R2-1711850			

- R2-1711850 Clarifications CR Huawei, HiSilicon CR Approval R2-1710549 Rel-15 36.746 15.0.0 FS\_feD2D\_IoT\_relay\_wearable  
=> Remove changes on changes  
=> The CR is agreed in principle in R2-1711862
- R2-1711573 Consideration on Service continuity for feD2D ITL discussion Rel-15  
=> Not treated

## 9.2 WI: Shortened TTI and processing time for LTE

(LTE\_sTTIandPT-core; leading WG: RAN1; REL-15; started: June 16; target: Dec. 17; WID: RP-171468)

Time budget: 0.5 TU

*Documents in this agenda item will be handled in a break out session*

*Including output from email discussion [99#07][LTE/sTTI] – Running CR 36.300 – Ericsson*

*Including output from email discussion [99#08][LTE/sTTI] – Running CR 36.331 – Ericsson*

*Including output from email discussion [99#09][LTE/sTTI] – Running CR 36.321 Ericsson*

*Including output from email discussion [99#34][LTE/sTTI] – SPS for sTTI*

- R2-1710007 LS on UE capability signalling for sTTI configurations (R1-1714764; contact: Intel) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN4 Cc:RAN2  
=> Noted
- R2-1710008 LS on Stage 2 description of short TTI and short processing time (R1-1714768; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2  
=> subslot definition needs to be added  
=> The changes in R1-1712912 are endorsed  
=> Noted
- R2-1710016 Reply LS on short processing time and short TTI (R1-1715280; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2  
=> Noted
- R2-1711829 LS on RRC parameters for WI on shortened TTI and processing time for LTE (R1-1714986; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2  
=> Noted
- R2-1710495 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR Rel-15 36.300 14.4.0 B LTE\_sTTIandPT  
=> The running CR is endorsed
- R2-1710496 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR Rel-15 36.302 14.3.0 B LTE\_sTTIandPT  
=> The CR is moved to email discussion
- R2-1710497 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR Rel-15 36.306 14.4.0 B LTE\_sTTIandPT  
=> The CR is moved to email discussion
- R2-1710498 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR Rel-15 36.321 14.4.0 B LTE\_sTTIandPT

=> The running CR is endorsed

R2-1710499 Running CR for introduction of shortened TTI and processing time for LTE Ericsson  
draftCR Rel-15 36.331 14.4.0 B LTE\_sTTIandPT

=> The running CR is endorsed

#### SPS

R2-1710403 Running CR for SPS in sTTI TS 36.331 Huawei, HiSilicon CR Rel-15 36.331  
14.4.0 3075 - B LTE\_sTTIandPT-Core

- Ericsson would like to change the values
  - Qualcomm asks if there is something to prevent us to have SPS on both PUSCH and Spusch. Huawei thinks that we agreed that the intervals can be configured but we didn't conclude if would have only one active at the time.
  - LG thinks that if we have both we have to discuss activation/deactivation, as DCI currently doesn't explicitly distinguish. Nokia thinks that we can just support one active at a time. Huawei agrees.
  - Nokia indicates that RAN1 has to tell us whether we can signal with SPS is active.
  - Nokia doesn't think we should just add the TDD aspects without first asking RAN1. Huawei explains that in RAN1 they support slot based.
- => FFS whether SPS and sSPS can be active at the same time.  
=> the CR is technically endorsed

R2-1710404 Running CR for SPS in sTTI TS 36.321 Huawei, HiSilicon CR Rel-15 36.321  
14.4.0 1185 - B LTE\_sTTIandPT-Core

=> The CR is not treated

R2-1710492 Remaining issues of sTTI and SPS Ericsson discussion Rel-15  
LTE\_sTTIandPT

- Ericsson explains that these values assume n+6
  - Ericsson asks if there any concerns to support sSPS on SCells. Qualcomm thinks that there isn't a use case for that. Ericsson thinks that if we can have it for free then why don't we have it.
- => sSPS is supported on PCell. FFS if sSPS is also supported in SCell.  
=> The final values can be decided after RAN1 completes the discussions  
=> Noted

#### SR

R2-1711586 Remaining Issues on SR and BSR for short TTI Qualcomm Incorporated discussion

*Proposal 1: SR/BSR design should assume that a logical channel group does not contain a mix of logical channels which can be sent only on sTTI or only on legacy TTI.*

=> RAN2 assumes that for SR/BSR design a logical channel group does not contain a mix of logical channels which can be sent only on sTTI or only on legacy TTI.

*Proposal 2: When SR can be transmitted on either PUCCH or sPUCCH, the TTI for SR transmission is chosen according to the TTI mapping for the logical channel with the highest priority which has pending data.*

- Nokia and LG thinks that it should be linked to the logical channel that triggered the BSR.
- Intel thinks that this is UE implementation
- Intel asks if there are two logical channels that are mapped to sSR and SR, would we need to transmit both.

*Proposal 1: confirm if a LCH is configured to use both sTTI and TTI, it can send SR on both sPUCCH and PUCCH, and if it is configured to use only sTTI or TTI, it can send SR only on sPUCCH or PUCCH.*

- LG has an understanding that the SR resource should not be linked to the TTI length for PUSCH.

*Proposal 4a: When regular or periodic BSR can be transmitted on either PUSCH or sPUSCH, the TTI for BSR transmission is chosen according to the TTI mapping for the logical channel with the highest priority in this BSR.*

- Nokia understands that we have no restrictions for MAC CE so BSR can be transmitted on anything
- => Noted

R2-1710815 SR procedure for sTTI    Nokia, Nokia Shanghai Bell    discussion    Rel-15  
LTE\_sTTIandPT

*Proposal 2: SR mapping restriction only applicable to the regular BSR triggered by higher priority data arrival, but not to SR triggered by retransmission BSR.*

- Nokia explains that the UE doesn't need to remember which logical channel triggered the initial BSR
- LG thinks it's simpler to not distinguish between first transmission and retransmission

How to determine which SR to chose (BSR that triggered)

- Nokia thinks that one option is to depend on the logical channel in the buffer, but the BSR trigger is by one logical channel. Lenovo agrees that it should be the BSR that triggered.
- Qualcomm thinks that if we go to the highest priority channel.
- Huawei also thinks that it should be the highest.

*Proposal 4: SR failure when maximum retransmission number reached for either PUCCH or sPUCCH, sPUCCH and PUCCH for all serving cells are released.*

- Intel thinks that we shouldn't trigger a SR failure too prematurely, so the trigger should be if both SR fails.
- InterDigital thinks that if we have two counters we should have a separate procedure. Qualcomm agrees.
- LG also thinks that failure should be separately handled, as there is a different performance.
- Huawei supports Nokia's proposal
- => Noted

**Agreements:**

1. The mapping for logical channel to SR is explicitly signalled. The signalling is optional and if mapping not present the logical channel can be mapped to all SR configurations. One or more SR configuration can be configured per logical channel.
2. SR transmission is chosen according to the SR mapping for the logical channel which triggered the BSR [FFS for retransmission BSR - either highest priority logical channel in buffer or all logical channel included in the BSR]
3. As in legacy, the MAC entity shall transmit at most one Regular/Periodic BSR in a TTI/sTTI across all carriers
4. As in legacy, the UE may include a padding BSR on a TTI or sTTI which does not contain a Regular/Periodic BSR.
5. Working assumption: When maximum retransmission for sPUCCH have reached the sPUCCH resource is released. [FFS: when sPUCCH resource is released all logical channels can use the SR]. When maximum retransmission PUCCH is reached the legacy behaviour applies.

☒ [99bis#47][LTE/sTTI] CR to 36.300 (Ericsson)

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

☒ [99bis#48][LTE/sTTI] CR to 36.321 (Ericsson)

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

☒ [99bis#49][LTE/sTTI] CR to 36.331 (Ericsson)

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

- ☒ **[99bis#50][LTE/sTTI] CR to 36.302 (Ericsson)**
  - Intended outcome: Running CR
  - Deadline: Thursday 2017-11-09
- ☒ **[99bis#51][LTE/sTTI] CR to 36.306 (Ericsson)**
  - Intended outcome: Running CR
  - Deadline: Thursday 2017-11-09
- ☒ **[99bis#52][LTE/sTTI] Remaining open issues on sTTI (Ericsson)**
  - Identify the L2 timers open issues
  - Identify HARQ open issues
  - Deadline: Thursday 2017-11-09

Not treated

R2-1710493	SR and BSR	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1710397	SR failure handling for sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1710494	Scheduling Requests with short TTI	Ericsson	draftCR	Rel-15	36.321 14.4.0 B
R2-1710754	Separated SR_COUNTER and sr-ProhibitTimer	LG Electronics	Mobile Research	discussion	LTE_sTTIandPT-Core
R2-1710398	Remaining issues on SR configuration for sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1710399	Handling of SR configurations for CA case in sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core

HARQ

Not treated

R2-1710402	HARQ Process ID Calculation to support SPS for sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1710490	HARQ process handling with different TTIs lengths	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1710396	MAC impact of HARQ process sharing between TTI and sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core

L2 timers

Not treated

R2-1710401	Impacts of sTTI on L2 Timers	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1710491	Impact of sTTI on L2 timers	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1710500	sPUCCH Utilization Strategy	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1710400	Handling of MAC CE Priority Handling in sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1711525	Modelling of sTTI in MAC	Ericsson India Private Limited	discussion	Rel-15	LTE_sTTIandPT

## 9.3 Void

## 9.4 Study on Enhanced Support for Aerial Vehicles

(FS\_LTE\_Aerial; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: SID: RP-171050)

Time budget: 1.5 TU

*Documents in this agenda item will be handled in a break out session*

### 9.4.1 General

(work plan and TR skeleton)

Including output from email discussion [99#38][LTE/UAV] Running TR36.777 (DOCOMO)

R2-1710009 LS on TP for key performance indicator, identified problem, evaluation assumptions, channel modelling, and evaluation results (R1-1714860; contact: Ericsson) RAN1 LS in Rel-15 FS\_LTE\_Aerial To:RAN2

=> Noted

R2-1710022 LS on TP for remaining evaluation assumptions and channel modelling (R1-1715303; contact: Ericsson) RAN1 LS in Rel-15 FS\_LTE\_Aerial To:RAN2

=> Noted

R2-1711737 TR 36.777 v030 NTT DOCOMO INC. draft TR Rel-15 36.777 0.3.0  
FS\_LTE\_Aerial revised in R2-1711966

R2-1711966 TR 36.777 v030 NTT DOCOMO INC. draft TR Rel-15 36.777 0.3.0  
FS\_LTE\_Aerial

=> Update according to the agreements from this meeting and new RAN1 progress.

### 9.4.2 Requirements and parameter identification

(Identify the heights, speeds, latency, reliability, data rate, positioning accuracy, etc , taking into account the regulation viewpoints)

R2-1711073 On the requirements of connectivity services for drones Ericsson discussion Rel-15 FS\_LTE\_Aerial

Agreement:

Adopt the range 60-100 kbps for UL/DL rate for command and control.

### 9.4.3 Potential enhancements for UAV interference problem

(Solutions to detect whether UL signal from an air-borne UE increases interference in multiple neighbour cells and whether an air-borne UE incurs interference from multiple cells)

Including output from email discussion [99#37][LTE/UAV] DL and UL Interference detection (DOCOMO)

R2-1711738 Summary of email discussion [99#37][LTE/UAV] DL and UL Interference detection NTT DOCOMO INC. discussion Rel-15

Capture the following observations into TR

**UL/DL Interference - radio propagation impact:**

The percentage of UAVs experiencing cell-edge like radio conditions (i.e. poor DL SINR) is much higher as compared to ground UEs.

The number of neighbouring cells from UE perspective incurring high level of DL interference to UAVs is higher than for ground UEs.

If the BS antennas are down tilted, drone may be served by a faraway base station instead of the closest one.

**Interference detection mechanism solution – general:**

DL interference detection can be performed based on measurements reported by the UE  
 UL interference detection can be performed based on measurements at the eNB or estimated based on measurements reported by the UE”.

**Interference detection mechanism: UL/DL reciprocity:**

DL PL and UL PL for a UAV-UE may differ in some scenarios where reciprocity does not hold e.g. due to different side lobe orientations, or different channel characteristics in an FDD deployment

**Measurement quantity to use for UL interference detection:**

RSRP may be used as one of the metrics for UL interference estimation in certain scenarios.

**Interference detection mechanism: Problem in existing Reporting mechanism:**

Measurement report may not contain results for all significantly interfered cells due to limit on the number of reported cells and ranking of results by RSRP without considering eNB transmission power

Potential solutions:

1. Identify (airborne) UE causing interference: NW based solution including solutions in section 5.1, 5.2 and solution 9.
2. Identify (airborne) UE causing interference using information from UE, e.g., direct in-flight mode indication, altitude information, location information.
3. Identify (airborne) UE causing interference – UE based : MR reporting enhancement, e.g., introduce new events or new values to assist the NW.

✉ **[99bis#30][LTE/UAV] Capture potential solutions for DL and UL Interference detection [DCM]**

Capture the agreed potential solutions into TR

Capture the agreed observations into TR

Intended outcome: Agreeable TP

Deadline: Thursday 2017-11-09

R2-1711528	Potential enhancements for UAV interference problem 15 FS_LTE_Aerial	Ericsson	discussion	Rel-
R2-1710405	Interference Detection for Drones Huawei, HiSilicon FS_LTE_Aerial		discussion	Rel-15
R2-1711374	Discussion for potential measurement enhancements for aerial UE discussion Rel-15 FS_LTE_Aerial R2-1708973	Lenovo, Motorola Mobility		
R2-1710799	Network-based UL interference detection for Aerials discussion	Kyocera, KDDI, KT Corp		
R2-1710665	Detection of UAV interference InterDigital 1708734		discussion	Rel-15 FS_LTE_Aerial R2-
R2-1711378	Enhanced Measurement according to Interference Level Rel-15 FS_LTE_Aerial	LG Electronics Finland	discussion	

#### 9.4.4 Potential enhancements for handover

*(Identify if enhancements in terms of cell selection and handover efficiency as well as robustness in handover signalling can be achieved)*

R2-1710407	Simulation Results of Mobility Issues for Drones 15 FS_LTE_Aerial	Huawei, HiSilicon	discussion	Rel-
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- Ericsson would like to know the handover rate definition in the simulation.
  - Huawei take both successful and failure handover into account.
  - Intel can't understand the Ping-pong rate in figure 8.
- => Noted

R2-1711463 Mobility enhancements for Aerial vehicles – full buffer scenario results Nokia, Nokia  
Shanghai Bell discussion Rel-15 FS\_LTE\_Aerial

- Huawei wonder how to calculate percentage of served UE.

=> Noted

R2-1711462 Mobility enhancements for Aerial vehicles – finite buffer scenario results Nokia, Nokia  
Shanghai Bell discussion Rel-15 FS\_LTE\_Aerial

- Huawei observe higher handover rate than Huawei provided.

=> Noted

R2-1710890 Handover performance results for aerial vehicles Qualcomm Incorporated discussion Rel-  
15 FS\_LTE\_Aerial

=> Noted

R2-1711074 Mobility Simulations of Aerial Ues Ericsson discussion Rel-15 FS\_LTE\_Aerial  
Revised to R2-1711938

=> Noted

R2-1711938 Mobility Simulations of Aerial Ues Ericsson discussion Rel-15 FS\_LTE\_Aerial  
Revision of R2-1711074

R2-1711825 Mobility Performance for UAV UE NTT DOCOMO, INC discussion Rel-15  
FS\_LTE\_Aerial

=> Noted

☒ **[99bis#31][LTE/UAV] Capture handover simulation results with observations [Huawei]**  
Intended outcome: agreeable TP  
Deadline: Thursday 2017-11-09

R2-1711739 UAV Field Trial Result NTT DOCOMO INC. discussion FS\_LTE\_Aerial

=> Noted

R2-1710887 Field trial results on handover performance for aerial vehicles Qualcomm Incorporated  
discussion Rel-15 FS\_LTE\_Aerial R2-1708237

- Ericsson think the field test results depending the network condition.

=> Noted

☒ **[99bis#60][LTE/UAV] Capture field trial results (Qualcomm)**  
- Capture the results at least from DCM, Qualcomm and KDDI.  
- Additional results from other companies  
Intended outcome: agreeable TP  
Deadline: Thursday 2017-11-09

R2-1711445 Potential mobility enhancements for UAVs Nokia, Nokia Shanghai Bell discussion Rel-  
15 FS\_LTE\_Aerial R2-1708667

P1

- Ericsson think the information is already available. Nokia would like to study whether there is new required.
- Qualcomm, LG, Sony and Lenovo support proposal 1.
- Xiaomi would like to know the detail of the route information mean.
- Qualcomm wonder how to specify the information. Huawei share the same concern.

P2

- Nokia point how eNB get the information can FFS.

Agreements:  
1 Study how a UE's "air-borne" status (e.g. altitude, speed etc.) can be efficiently indicated to RAN and used e.g. for potential HO parameters adjustment.



2 Other solutions from the papers in 9.4.4 are not excluded.
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- R2-1710406 Discussion on Virtual drone cell Huawei, HiSilicon discussion Rel-15  
FS\_LTE\_Aerial
- Qualcomm, Intel, Nokia and Ericsson think the solution is in the scope of RAN1.
  - Nokia support observation 1 and 2.
  - Huawei think the RRC configuration is needed.
- => Noted
- [99bis#61][LTE/UAV] Identify potential solutions on mobility enhancement (Ericsson)**  
Based on the papers in 9.4.4  
The solutions for interference detection can also be considered  
Intended outcome: discussion report  
Deadline: Thursday 2017-11-09
- R2-1711027 Discussion on measurement for Aerial Vehicles handover Sony discussion Rel-15  
FS\_LTE\_Aerial
- R2-1710796 Considerations for cell selection and reselection with UAVsKyocera, KDDI, KT Corp  
discussion
- R2-1711376 Handover Failure Handling of Aerial UE LG Electronics Inc. discussion Rel-15  
FS\_LTE\_Aerial R2-1709462
- R2-1711377 Consideration for potential mobility enhancement for aerial UE Lenovo, Motorola Mobility  
discussion Rel-15 FS\_LTE\_Aerial R2-1708975
- R2-1710409 Potential enhancements for drones in idle state Huawei, HiSilicon discussion Rel-15  
FS\_LTE\_Aerial R2-1708542
- R2-1710887 Field trial results on handover performance for aerial vehicles Qualcomm Incorporated  
discussion Rel-15 FS\_LTE\_Aerial R2-1708237
- R2-1711379 Discussion for status management for aerial UE Lenovo, Motorola Mobility discussion  
Rel-15 FS\_LTE\_Aerial
- R2-1711408 Measurement report mechanism for Drones Huawei, HiSilicon discussion Rel-15  
FS\_LTE\_Aerial R2-1708545

## 9.4.5 Identify certification

*(Identification of an air-borne UE that does not have proper certification for connecting to the cellular network while air-borne)*

- R2-1711446 Air-borne UE identification mechanism Nokia, Nokia Shanghai Bell discussion Rel-15  
FS\_LTE\_Aerial
- R2-1711075 Identify certification for drones Ericsson discussion Rel-15 FS\_LTE\_Aerial
- R2-1710408 Identification of Air-borne UE Huawei, HiSilicon discussion Rel-15  
FS\_LTE\_Aerial
- R2-1711026 Discussion on identification and certification of Aerial Vehicles Sony discussion Rel-15  
FS\_LTE\_Aerial R2-1709517
- R2-1711380 Consideration for identification issues for drone UE Lenovo, Motorola Mobility  
discussion Rel-15 FS\_LTE\_Aerial R2-1708976
- R2-1711447 TP on air-borne UE identification mechanism Nokia, Nokia Shanghai Bell discussion  
Rel-15 FS\_LTE\_Aerial

## 9.4.6 Others

- R2-1711375 Aerial Traffic Handling using Positioning Identification LG Electronics Inc. discussion  
Rel-15 FS\_LTE\_Aerial R2-1709460

- ✉ **[99bis#08][LTE/UAV] Running TR36.777 (DCM)**
  - Capture agreements from this meeting
  - Capture the agreed TPs from email discussion
  - Intended outcome: Agreed running TR
  - Deadline: Thursday 2017-10-26

## 9.5 Further video enhancements for LTE

*(LTE\_ViLTE\_enh2-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: WID: RP-171392)*

*Time budget: 0 TU*

*This AI is a placeholder only - no documents to be submitted to this AI. The WI has no time budget allocated for this meeting and will be discussed again at RAN2#100.*

### 9.5.1 General

*(work plan)*

### 9.5.2 Local caching for UE assistance video request

*Including output from email discussion [99#33][LTE/eViLTE] UE assistance information (CMCC)*

### 9.5.3 Enhancement to solve the problem of critical data discard

### 9.5.4 Others

## 9.6 QoE Measurement Collection for streaming services in E-UTRAN

*(LTE\_QMC\_Streaming; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: WID: RP-170956)*

*Time budget: 0.5 TU*

*Documents in this agenda item will be handled in a break out session*

### 9.6.1 General

*(work plan)*

### 9.6.2 QoE measurement collection solutions

*Including output from email discussion [99#39][LTE/QMC] RAN controlled CP based solution (Huawei)*

- R2-1710708 Summary on [99#39][LTE/QMC] RAN controlled CP based solution Huawei discussion Rel-15 LTE\_QMC\_Streaming-Core => Noted
- R2-1711688 Detailed analysis of LTE QMC CP solution 4 and 5 Nokia, Nokia Shanghai Bell discussion Rel-15 36.331 LTE\_QMC\_Streaming
  - Ericsson think the priority in solution 4 is very complicated. Regarding solution 5, the recovery is slow.
- R2-1710709 Discussion on CP solution for QMC Huawei, HiSilicon discussion Rel-15 LTE\_QMC\_Streaming-Core
  - Vodafone, China Unicom and China Telecom support this solution.
  - Ericsson think the new SRB can also be used for future measurement collection.

- Agreements:
- 1 Introduce SRB4 and SRB4 can be configured via the RRCConnectionReconfiguration message.
  - 2 introduce a new uplink RRC message and the naming could be "application layer measurement report", and this message uses SRB4. For this new RRC message, it includes a container of report with Octet string (1..8000).
  - 3 Introduce a new IE "application layer measurement configuration" in the RRCConnectionReconfiguration message, and this IE includes a container.
  - 4 If UE AS layer receives the application layer measurement configuration, it shall forward the configuration to upper layers
  - 5 eNB can inform UE to release the application layer measurement configuration
  - 6 Introduce a new UE capability for QMC.
  - 7 Remove "FFS: QoE measurement will be continued in case of intra-eNB HO and inter-eNB HO, if no explicitly released by the eNB, and both source and target cell belong to defined same measurement reporting area." from RAN2#98 minutes.

☞ **CBF:** => Draft a common LS in R2-1711945 to RAN3, CT1, SA4 and SA5 by including RAN2 progresses (Offline#101, Huawei).

☒ **[99bis#09][LTE/QMC] CR of Introduction of QMC in 36.331 (Huawei)**

Intended outcome: Agreed CR in principle  
Deadline: Thursday 2017-10-26

=> Agreed in principle in R2-1712073

☒ **[99bis#10][LTE/QMC] CR of Introduction of QMC in 36.300 (Huawei)**

Intended outcome: Agreed CR in principle  
Deadline: Thursday 2017-10-26

=> Agreed in principle in R2-1712074

☒ **[99bis#11][LTE/QMC] CR of Introduction of QMC in 36.306 (Huawei)**

Intended outcome: Agreed CR in principle  
Deadline: Thursday 2017-10-26

=> Agreed in principle in R2-1712075

R2-1711832	Solution enhancement for QoE Measurements LTE_QMC_Streaming	Ericsson	discussion	Rel-15	
	=> Noted				
R2-1710506	Start and stop of QoE Measurements LTE_QMC_Streaming	Ericsson	discussion	Rel-15	
R2-1710710	Introduction of QoE Measurement Collection for LTE 15 36.300 14.4.0 1063 - B LTE_QMC_Streaming-Core	Huawei, HiSilicon		CR	Rel-
R2-1710711	Introduction of QoE Measurement Collection for LTE 15 36.306 14.4.0 1512 - B LTE_QMC_Streaming-Core	Huawei, HiSilicon		CR	Rel-
R2-1710712	Introduction of QoE Measurement Collection for LTE 15 36.331 14.4.0 3087 - B LTE_QMC_Streaming-Core	Huawei, HiSilicon		CR	Rel-
R2-1711286	Introduction of QoE Measurement Collection for LTE (CP based) CR Rel-15 36.331 14.4.0 3104 - B LTE_QMC_Streaming	Nokia, Nokia Shanghai Bell			
R2-1711287	Introduction of QoE Measurement Collection for LTE Rel-15 36.331 14.4.0 3105 - B LTE_QMC_Streaming	Nokia, Nokia Shanghai Bell		CR	
R2-1710505	Solution enhancement for QoE Measurements LTE_QMC_Streaming	Ericsson	discussion	Rel-15	
	=> Revised in R2-1711832				

### 9.6.3 Others

## 9.7 LTE connectivity to 5G-CN

(LTE\_5GCN\_connect-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171432)

Time budget: 1.5 TU

At this meeting, due to the commonality with NR, this WI will be handled in the main session.

### 9.7.1 Organisational

Including incoming LSs, rapporteur inputs, running CRs

Principles on what to specify in which specs, terminology, etc

- R2-1710002 Reply LS to Supported features by 5GC for E-UTRA connected to 5G CN (C1-173571; contact: Huawei) CT1 LS in Rel-15 5GS\_Ph1-CT, NR\_newRAT-Core To:SA2, RAN2 Cc:SA, SA1, SA5, RAN, RAN3 To:SA2, RAN2 Cc:SA, SA1, SA5, RAN, RAN3  
=> Noted
- R2-1711105 Work plan on LTE\_5GCN\_connect Huawei, Ericsson Work Plan Rel-15  
=> Noted
- R2-1711106 Further discussion on how to specific E-UTRA connected to 5GC Huawei, HiSilicon discussion Rel-15 LTE\_5GCN\_connect-Core  
=> Noted
- R2-1711583 Running 36.300 CR for LTE connectivity to 5GCN (Option1) Huawei draftCR Rel-15  
36.300 14.4.0 B LTE\_5GCN\_connect-Core
- Nokia suggest to avoid the term ng-eNB within 36.300 unless really needed. There would be just one brief section to clarify the usage of the terminology. Huawei think that for the new chapter it should be ok to use ng-eNB.
  - Ericsson suggest to minimise the usage of terminate in ng-eNB.
  - Nokia had a proposal in their CR how to avoid the ng-eNB term. We should avoid changing in every place.
  - Nokia think the CR doesn't mention that an eNB can be connected to both core.
  - LG think that currently we don't describe AC in stage 2 for LTE. Is it needed for eLTE? Nokia have the same view.
- => To be revised to address the comments raised.  
=> Remove AC from stage 2 - can be reviewed after more progress is made on AC for LTE/5GC  
=> Revised in R2-1712001 (Offline discussion #42)
- R2-1712001 Running 36.300 CR for LTE connectivity to 5GCN (Option1) Huawei draftCR Rel-15  
36.300 14.4.0 B LTE\_5GCN\_connect-Core  
=> Endorsed
- ✉ **[99bis#02][LTE/5GC] CR to 36.300 (Huawei)**  
Capture agreements from this meeting  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-10-26  
=> Endorsed as a running CR in R2-1712069
- R2-1711584 Running 36.300 CR for LTE connectivity to 5GCN (Option2) Huawei draftCR Rel-15  
36.300 14.4.0 B LTE\_5GCN\_connect-Core

Withdrawn

R2-1711107	Running 36.300 CR for LTE connectivity to 5GCN (Option1)	Huawei CR	Rel-15
	36.300 14.4.0 1064 - B LTE_5GCN_connect-Core	Withdrawn	
R2-1711108	Running 36.300 CR for LTE connectivity to 5GCN (Option2)	Huawei CR	Rel-15
	36.300 14.4.0 1065 - B LTE_5GCN_connect-Core	Withdrawn	

## 9.7.2 Stage 2 aspects

*Including AS support for EPC/5GC selection, impact of flow based QoS, inter-RAT mobility (e.g. between E-UTRA/5GC and E-UTRA/EPC but not mobility in inactive which is addressed by AI 10.4.1.7.4), etc.*

*Impact to E-UTRA DC due to flow based QoS, operation of flow based QoS at intra system handover and inter system handover, access control, inactive state, and slicing will be discussed when NR has made more progress on these items, and hence will not be discussed at this meeting.*

### SRB PDCP version

R2-1710160 Type of PDCP Protocol Adoption for E-UTRAN connected to 5GCN Qualcomm India Pvt Ltd discussion Rel-15 LTE\_5GCN\_connect-Core

- R2-1711110 NR PDCP for SRB for UE accessing 5GC via ng-eNB Huawei, HiSilicon discussion Rel-15 LTE\_5GCN\_connect-Core
- discussed jointly with the previous paper
  - LG wonder if spare values in msg 3 mean we cannot use the establishment cause. Qualcomm assume the type of PDCP indication would be independent to the establishment cause. Huawei think the only current option in msg3 is to use a spare code point. Other option would be to create a new message but even that would not give enough space.
  - Qualcomm think it may depend on whether the TMSI can indicate the core network type.
  - Nokia ask if this is a preference or is it saying this is the core network type. Qualcomm understand it will correspond to the CN type indicated to upper layers.
  - LG prefer to use msg5 for the indication and think that eNB may select MME due to node balancing. Think the UE should always use LTE PDCP.
  - Qualcomm think that blind detection is not a good option and hence it is better to use an explicit indication. Vivo agree that blind detection is not a good option. Suggest to use LTE PDCP and then reconfigure it.
  - Ericsson think such blind detection would be a new function for the eNB.
  - Samsung wonder what is the value in using NR PDCP. Suggest to follow the EN-DC approach and let the network reconfigure. OPPO agree with Samsung.
  - Lenovo think there could be UE initiated messages that could be lost during the reconfiguration. Qualcomm think it is better for eLTE that the UE has the same PDCP for both CP and UP. It will also help smooth handover between 5GC and EPC.
  - Huawei think that NR PDCP must be used to use 5G security.
  - Ericsson prefer option 1.

#### Agreements

- 1- Msg 5 is used to indicate the CN type. eNB shall initially configure SRB1 with LTE PDCP. Upon receiving CN Type Selection = 5GCN in Message 5, eLTE eNB reconfigures SRB1 with NR-PDCP

FFS: Whether the reconfiguration to NR PDCP is required before SMC.

- 2- If it is found during further work that changes are required in Message 3 for other reasons, then this decision can be revisited (a solution where eNB initially configures SRB1 with NR-PDCP can be adopted)

R2-1710620 CN type change and PDCP for E-UTRA connected to 5GC Intel Corporation discussion Rel-15 LTE\_5GCN\_connect-Core

R2-1710192 NR PDCP for SRBs Ericsson discussion Rel-15 LTE\_5GCN\_connect-Core

S-TMSI

- R2-1710193 UE network identifier impacts on LTE connected to 5GC Ericsson discussion Rel-15  
 LTE\_5GCN\_connect-Core
- Intel think the important aspect is whether the S-TMSI space is shared between 5G and EPC.
  - Qualcomm think that there is an issue with sharing the S-TMSI space.
  - Huawei think it may not be needed in message 3 for the network to know whether the S-TMSI is 5G or EPC. Intel think currently we ensure no collision in S-TMSI but if we allow the same space to be reused then there is a risk of collision.
  - Ericsson think it is very unlikely that the space will be shared.
  - Lenovo think that if we can accept the collision probability then it would not matter whether they are shared.
- => LS to SA2/CT4 to ask if the 5G S-TMSI size will be the same as in EPC and also ask if the S-TMSI space will be shared between 5G and EPC. Draft LS in R2-1712003 (Offline discussion #43, Ericsson). Can include both NR and eLTE WI codes.  
 => Revised in R2-1712008
- R2-1712008 [DRAFT] LS on details of network identifiers Ericsson LS out Rel-15  
 LTE\_5GCN\_connect-Core To:CT4, SA2
- => Withdrawn
- R2-1712003 [DRAFT] LS on details of network identifiers Ericsson LS out Rel-15  
 LTE\_5GCN\_connect-Core To:SA2, CT4
- ☒ **[99bis#01][LTE/5GC] LS to SA2/CT4 (Ericsson)**  
 Intended outcome: Approved LS  
 Deadline: Thursday 2017-10-19  
 => Approved in R2-1712068
- R2-1710194 Draft LS on UE network identifiers Ericsson LS out Rel-15 NR\_newRAT-Core

*Inter-RAT mobility*

- R2-1710190 IDLE/INACTIVE mobility to GERAN/UTRAN/CDMA2000 Ericsson discussion Rel-15  
 LTE\_5GCN\_connect-Core R2-1707797
- P3
- Huawei is not sure that redirection to 2G/3G should be supported, as the UE will need to register after the change to 2G/3G. Qualcomm think this is ok if there is no CN impact.
  - Intel also wonder whether this includes redirection from one CN to the other CN. This could be asked in the LS.
  - Ericsson think the main intention is to support the RAN functionality of redirection. SA2 can consider the UE behaviour when it gets to the target.
- P4
- Qualcomm think that ping pong between 5GC and 2G/3G will cause a lot of signalling and we should have a mechanism to minimise this.
  - DT is concerned that this adds another layer of planning.
  - Intel understand that the RAN has flexibility to set the idle mobility info it can use SPID or not.
- P5
- Qualcomm think that in PLMN selection then eLTE and NR are considered as the same priority, but in this proposal then they would be different. Ericsson think the proposal does not contradict. eLTE is prioritised and will be used if the target cell supports eLTE but if it doesn't support only then would the UE change to EPC.

Agreements:

- 1 RAN2 understanding based on SA2 decisions is that inter-RAT active mode handover or cell change order is not supported between LTE/5GC and 2G/3G systems.
- 2 Inter-RAT active mode measurement configuration and reporting on 2G/3G RATs are supported in the same way as today.

- 3 RAN functionality of release with redirect info to 2G/3G RATs is supported in the same way as today. For redirection to 2G then UE only accepts redirection to 2G if AS security protected (NAS configuration is not required).
- 4 Idle mode mobility to 2G/3G/LTE/NR is supported including IDLE mode mobility control info for all RAT (i.e. behaviour exactly the same as LTE/EPC and the network is responsible to set dedicated frequency priorities appropriately)
- 5 A single LTE RAT is used in the cell reselection priorities regardless if the RAT support 5GC or not (i.e. behaviour exactly the same as LTE/EPC and the network is responsible to set dedicated frequency priorities appropriately)

R2-1711112 Discussion on mobility scenario for E-UTRA connected to 5GC Huawei, HiSilicon  
discussion Rel-15 LTE\_5GCN\_connect-Core R2-1708398

P1

- Huawei explain the source RAT must decide the target CN as the procedure to be triggered is different.
- Ericsson wonders how the source knows about the target node CN information. Huawei think this can be left to RAN3 but assume either OAM or X2. Qualcomm think X2 would not be possible for this case.
- Nokia think this suggests a service based handover rather than radio based.

P2

- Ericsson think that an explicit indicator is not needed in the HO command.
- Intel think it could be possible to infer from other parameters but need more discussion whether we do that.

Agreements:

- 1 RAN2 understand that the source eNB/ng-eNB decides handover procedure to trigger (e.g. via the same CN type or to the other CN type)
- 2 UE has to know the target CN type from the handover command during intra-LTE inter-system HO, intra-LTE intra-system HO

FFS: Stage 3 detail whether this is an explicit indication or can be inferred from other information.

R2-1710949 Mobility issue in LTE connected to NextGen Core vivo discussion Rel-15 NR\_newRAT-  
Core R2-1708436

R2-1711024 Handover involving EPC and 5GC Sony discussion Rel-15 LTE\_5GCN\_connect-Core  
R2-1709516

*5GC availability/CN type selection*

R2-1710305 Further Consideration on CN Type Selection CATT discussion Rel-15  
LTE\_5GCN\_connect-Core

R2-1710789 Further considerations on the CN selection for E-UTRAN connected to 5G CN Samsung  
discussion Rel-15 LTE\_5GCN\_connect-Core

R2-1710157 Preventing Legacy LTE UEs from camping on eLTE Cells & PLMNs connected to New 5G Core  
Network only Qualcomm India Pvt Ltd discussion Rel-15 LTE\_5GCN\_connect-Core  
R2-1707786

R2-1710182 Discussion on UE preference and CN Selection OPPO discussion R2-1710175

R2-1710376 CN Type Modification Spreadtrum Communications discussion Rel-15 R2-1707975

R2-1710420 Multi-PLMN aspects of E-UTRA cell connected to 5GC ZTE Corporation, Sane Chips  
discussion Rel-15

R2-1710790 CN type indication for E-UTRAN connected to 5G CN Samsung discussion Rel-  
15 LTE\_5GCN\_connect-Core

R2-1710950 CN selection for LTE connected to 5GC vivo discussion Rel-15 NR\_newRAT-Core

R2-1711109 Handling on E-UTRA cell where some PLMNs only have access to 5GC Huawei, HiSilicon  
discussion Rel-15 LTE\_5GCN\_connect-Core

*Other*

R2-1710155	Draft LS on AS Security Aspects of LTE connectivity to 5G-CN out	Rel-15 LTE_5GCN_connect-Core	Qualcomm India Pvt Ltd	LS
R2-1710159	Access Stratum Security aspects of E-UTRAN connected to 5GCN discussion	Rel-15 LTE_5GCN_connect-Core	Qualcomm India Pvt Ltd	
R2-1710183	Discussion on ANR Functionality for eLTE	OPPO discussion		R2-1710177
R2-1710184	Security aspects of supporting LTE connected to 5GC	Rel-15 LTE_5GCN_connect-Core	Ericsson	discussion Rel-15 R2-1707790
R2-1710185	Draft LS to SA3 on security aspects	Rel-15 LTE_5GCN_connect-Core	Ericsson	LS out R2-1707791
R2-1710186	QoS for LTE connected to 5GC	Rel-15 LTE_5GCN_connect-Core	Ericsson	discussion R2-1707792
R2-1710187	Inactive state in LTE	Rel-15 LTE_5GCN_connect-Core	Ericsson	discussion
R2-1710188	Barring legacy UEs from 5GC only cells	Rel-15	Ericsson	discussion
R2-1710191	Message 3.5 in LTE connected to 5GC	Rel-15	Ericsson	discussion R2-1707840
R2-1710201	Discussion on Cell Barring Mechanism for eLTE	R2-1710176	OPPO	discussion
R2-1710421	Consideration on mobility for E-UTRA connected to 5GC discussion	Rel-15	ZTE Corporation, Sane Chips	
R2-1710692	Considerations on LTE connectivity to 5G-CN	Rel-15 LTE_5GCN_connect-Core	Qualcomm India Pvt Ltd	discussion R2-1707785
R2-1710951	Consideration on SRB configuration in eLTE	Rel-15 NR_newRAT-Core	vivo	discussion
R2-1710994	Capturing LTE connected to 5GC in TS36.300	Rel-15 LTE_5GCN_connect-Core	Nokia, Nokia Shanghai Bell	discussion
R2-1711111	Support of 5GS security in E-UTRA connected to 5GC	Rel-15 LTE_5GCN_connect-Core	Huawei, HiSilicon	discussion R2-1708403
R2-1711113	Flow based QoS for E-UTRA connected to 5GC	Rel-15 LTE_5GCN_connect-Core	Huawei, HiSilicon	discussion Rel-15
R2-1711114	Assistant information to perform CN selection	Rel-15 LTE_5GCN_connect-Core	Huawei, HiSilicon	discussion Rel-15
R2-1711122	RRC procedures for LTE connectivity to 5G-CN	Rel-15 LTE_5GCN_connect-Core	LG Electronics France	discussion Rel-15
R2-1711127	Support for PLMN selection while in INACTIVE state in eLTE	Rel-15 LTE_5GCN_connect-Core	LG Electronics Inc.	discussion R2-1709112
R2-1711145	INACTIVE state in eLTE	Rel-15 LTE_5GCN_connect-Core	LG Electronics Inc.	discussion R2-1709106
R2-1711157	Assistance information delivery for E-UTRA connected to 5GC	Rel-15 LTE_5GCN_connect	LG Electronics Inc.	discussion

*Late*

R2-1710175	Discussion on UE preference and CN Type Determination	OPPO	discussion
R2-1710176	Discussion on CN type based Cell Barring in eLTE	OPPO	discussion To:RAN1
R2-1710177	Discussion on ANR support in eLTE	OPPO	discussion
R2-1710338	RRC Inactive State aspects for E-UTRAN connected to 5GCN discussion	Rel-15 LTE_5GCN_connect, LTE_5GCN_connect-Core	Qualcomm India Pvt Ltd Withdrawn

## 9.8 Positioning Accuracy Enhancements for LTE

(LCS\_LTE\_acc\_enh-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171508)



Time budget: 1 TU

*Documents in this agenda item will be handled in a break out session*

## 9.8.1 Organisational

*Including incoming LSs, rapporteur inputs, running CRs*

R2-1711582 Updated work plan for UE Positioning Accuracy Enhancements for LTE work item Nokia, Nokia Shanghai Bell discussion Rel-15 LCS\_LTE\_acc\_enh-Core

- Endorsed as a plan moving forward
- => Noted

R2-1710023 LS on RAN1 agreements on UE GNSS carrier phase measurement (R1-1715306; contact: Nokia) RAN1 LS in Rel-15 UTRA\_LTE\_iPos\_enh2 To:RAN2 Cc:RAN4, RAN5

=> Noted

## 9.8.2 GNSS positioning enhancements

*RTK payload transmission, transparent or not? Supported RTK techniques, SSR, VRS, PPP, etc? The details on the support of UE based and UE assisted; The details about unicast and broadcast of RTK assistance data;*

*Including output from email discussion [99#47][LTE/Positioning] RTK assistance data encoding (Huawei)*

*Email discussion [99#47][LTE/Positioning] RTK assistance data encoding (Huawei)*

R2-1711311 Email discussion on RTK assistance data encoding Huawei discussion Rel-15 LCS\_LTE\_acc\_enh-Core

- Huawei clarify the container could be used for anything, including messages developed in 3GPP. They consider that there is value in using the container to broadcast ciphered messages (eNB cannot see the content).
- QC agree that the broadcast would use an OCTET STRING container for the ciphered data. But the content of the OCTET STRING can be defined in LPP.
- Nokia: details were discussed, maybe we can make a decision now.
- Huawei agree with QC that there would be a container in the SIB, the difference is what would be contained in it.
- Ericsson think there are no objections to option 2 and we could agree to the proposal in the summary.
- Huawei want to clarify what exactly is the meaning of the ASN.1 encoding. Ericsson understand it to mean we don't have the container (in LPP).
- Qualcomm understand that there would be an RRC container in the SIB but no container in LPP.
- Ericsson think it's not about whether there is a container but about the data encoding.
- Intel agree with Ericsson.
- ESA also support option 2 and think it would be important for the support of SSR. Using the transparent container would require multiple decoders and increase the complexity, and tie us down to what other SDOs have defined. We could end up excluding some GNSS because another SDO didn't complete their work.
- Huawei clarify the proposal refers to ASN.1 encoding in LPP.
- Qualcomm think we should have the same encoding for broadcast and unicast.
- Ericsson think there was a clear majority in the email discussion and no objections were raised against option 2.
- Intel agree that there should be one solution; if we take option 2 it should apply for unicast and broadcast.
- Huawei think you cannot use ASN.1 decoding in RRC for broadcast and this introduces a difference between the two.

- Qualcomm think you could copy the ASN.1 into RRC but it would be cleaner to have an OCTET STRING. Huawei wonder how this works with ciphering. Qualcomm think there would be a ciphered OCTET STRING from E-SMLC to eNB, but we haven't decided yet which node does the ciphering.
- Nokia think the email discussion scope was specific and we should take a decision on it, and discuss the broadcast details later.

- LS to RAN3 to update them on the outcome. Should take into account the outcome of the encryption discussion. Combined with output of the encryption discussion.

**Select option 2 (ASN.1 encoding) for RTK assistance data for both broadcast and uni-cast.**

*Other documents on RTK assistance data encoding*

R2-1711313	Discussion on unicast RTK positioning LCS_LTE_acc_enh-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1711314	Introducation of one container for RTK assistance data transmission draftCR Rel-15 36.355 14.3.0 B	LCS_LTE_acc_enh-Core		Huawei, HiSilicon
R2-1711315	Introducation of two containers for RTK assistance data transmission draftCR Rel-15 36.355 14.3.0 B	LCS_LTE_acc_enh-Core		Huawei, HiSilicon

*Support of new measurements*

R2-1711031	Running LPP CR for RTK GNSS positioning 36.355 14.3.0 B	LCS_LTE_acc_enh-Core	Qualcomm Incorporated	draftCR Rel-15
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- Ericsson wonder about how we would present the quality of the ADR measurements; would like to discuss further and avoid complexity.
- Qualcomm agree we could discuss this further. The quality in this CR was copied from LPPe.
- Ericsson to organise offline discussion on this topic [Ericsson, offline discussion #501].
- Nokia wonder if we need to discuss the ADR measurement capability some more; do we need an explicit carrier phase measurement capability?
- Qualcomm think the ADR capability is already there from Rel-9, and have just added another capability for the enhancements.
- Ericsson think we will identify capabilities in the ongoing discussion that may need to be added.
- Qualcomm would rather wait and capture the capability at the end, once we have the measurements and the reporting scheme.
- Nokia are OK to have a general running CR discussion.
- Qualcomm will keep the running CR updated with ASN.1 decisions.

Email discussion on the running LPP CR [Qualcomm], deadline for the February meeting.

R2-1711291	Addition of new IE to support UE-assisted RTK-GNSS measurements Rel-15 36.355 14.3.0 0188 -	B	LCS_LTE_acc_enh-Core	Ericsson	CR
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*SSR*

R2-1710536	GNSS positioning enhancements: ways forward to support SSR concept in Release 15 discussion Rel-15	LCS_LTE_acc_enh-Core			ESA
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- u-blox support the proposals and see SSR as important to support.
- Qualcomm think we could define a phased approach where we "aim" to complete it in Rel-15. Want to make sure we do not spend too much time on SSR and lose the opportunity to work on other objectives
- Nokia are fine with the concept but would like to keep the scope specific, e.g. to know what specific messages are supported.

- Ericsson also support the concept and want to make sure that the scope is specific. There is no intention to bypass RTCM, we want to make sure that we can finalise the specification.
- DT agree that the timeline is important. As of today they feel that SSR cannot be supported in an open way; the messages that are available openly are not enough to support a fully functioning SSR.
- ESA agree we can use a phased approach. At least RT-PPP should be possible using what's available today, with no support from additional SDOs. So this could be a specific objective. For SSR availability, there is a full SSR defined by Mitsubishi; if we want to support full PPP-RTK we would have to look to that. But the baseline proposal is for RT-PPP.
- Ericsson think there are two perspectives about "openness" of the messages, one from the UE perspective and one from the 3GPP perspective. ESA think we can follow the same approach as for network RTK, where we determined not to discuss how the E-SMLC receives the corrections.

**Support SSR concept, and thus PPP, RT – PPP, PPP – RTK. We aim to finish what we can in Rel-15. This applies to all GNSSs.**

**The following messages are adopted to support RT-PPP as a baseline:**

- **GPS SSR (1057 – 1059)**
- **GLONASS SSR (1063 – 1065)**
- **Galileo SSR (1240 – 1242)**
- **SBAS SSR (1246 – 1248)**
- **QZSS SSR (1252 – 1254)**
- **BeiDou SSR (1258 – 1260)**

**These proposed messages comprise a baseline and additional support can be discussed as the work carried out in 3GPP should not be restricted to only what has already been agreed by RTCM. Translate all agreed RTCM SSR message types and data fields to ASN.1 and add the corresponding information elements to the LPP *A-GNSS-ProvideAssistanceData* message.**

- Ericsson wonder if the atmospheric models should be reflected. ESA assume the models in LPPe can be reused but some discussion would be needed.
- Nokia think we could discuss this if time permits but it could be a later phase.
- Ericsson would like to add other candidates for support. ESA suggest carrier phase and precise atmospheric models (ionospheric and tropospheric).
- u-box would like to include integrity information as well. Qualcomm think we need to discuss what is meant by integrity; note that the incoming LS from SA3 found integrity was not needed. Ericsson agree the discussion is needed. This can be discussed offline.

- Future phase aims to support:

- o Carrier phase bias
- o Precise atmospheric models (ionospheric and tropospheric)

Email discussion on future phase support, including integrity information. [u-blox] Report for February meeting.

R2-1710537 GNSS positioning enhancements: detailed description of SSR messages for multi GNSS PPP  
ESA discussion Rel-15 LCS\_LTE\_acc\_enh-Core

*Withdrawn/not available*

R2-1711813 GNSS positioning enhancements: ways forward to support SSR concept in Release 15  
discussion Rel-15 LCS\_LTE\_acc\_enh-Core Withdrawn ESA

R2-1711814 GNSS positioning enhancements: detailed description of SSR messages for multi GNSS PPP  
ESA discussion Rel-15 LCS\_LTE\_acc\_enh-Core Withdrawn

### 9.8.3 Support for IMU positioning

*The details of IMU raw data; the sceanrio and benefits on how to use IMU raw data;*

For email discussion to identify the needed measurements. Goal is a joint TP if possible. Intel, deadline for the February meeting.

R2-1711476 IMU Sensor based positioning Intel Corporation, Ericsson, Sony discussion Rel-15 LCS\_LTE\_acc\_enh-Core  
R2-1711034 Mitigating Movement of a UE during Positioning using IMUs Qualcomm Incorporated discussion  
R2-1710640 Considerations for supporting IMU based positioning Fraunhofer IIS discussion Rel-15  
R2-1710075 Discussion on IMU positioning ZTE Corporation discussion  
R2-1710073 Introduction of IMU Positioning ZTE Corporation draftCR Rel-15 36.305 14.3.0 B LCS\_LTE\_acc\_enh-Core

### 9.8.4 UE-based OTDOA positioning

*What additional assistance information is required? Note, as second priority*

R2-1710071 Discussion on UE-based OTDOA positioning ZTE Corporation discussion  
R2-1711036 Introduction of UE-Based OTDOA Positioning Qualcomm Incorporated discussion Rel-15 LCS\_LTE\_acc\_enh-Core R2-1708523  
R2-1711038 Draft CR 36.305: Introduction of UE-based OTDOA Positioning Qualcomm Incorporated draftCR Rel-15 36.355 14.3.0 B LCS\_LTE\_acc\_enh-Core R2-1708525  
R2-1711316 Discussion on OTDOA positioning Huawei, HiSilicon discussion Rel-15 LCS\_LTE\_acc\_enh-Core  
R2-1711689 Consideration on UE-based OTDOA positioning LG Electronics Inc. discussion Rel-15 LCS\_LTE\_acc\_enh-Core R2-1709276

### 9.8.5 Broadcasting of assistance data

*SIB design for the tranmission of A-GNSS, RTK and, as second priority, UE-based OTDOA assistance information. Encryption of assistance data broadcasting (SA3 input is needed);*

*Encryption of assistance data broadcasting*

R2-1711290 Encryption of positioning broadcast information Ericsson discussion Rel-15

- Qualcomm wonder if we should ask SA2 about the key change frequency; it may be more in their work area rather than SA3. Nokia agree; we should at least keep SA2 in the loop. RAN2 could decide whether encryption is done at the E-SMLC but we should consult with SA2 and SA3.

[Discussed together with:]

R2-1711320 Discussion on encryption of broadcasted assistance data Huawei, HiSilicon discussion Rel-15 LCS\_LTE\_acc\_enh-Core

- Nokia would like to be specific about what information needs to be encrypted, e.g. eNB coordinates.
- Qualcomm consider that it is up to the operator what to cipher; from the standards point of view we should be able to cipher everything. Some deployments may cipher the UE-assisted OTDOA assistance data for business reasons. Ericsson agree.

- Nokia think SA2 should be informed. Will be in Cc: on the LS reply.
- Qualcomm and Huawei think the key update frequency is outside RAN2 scope.
- Ericsson want to avoid defining an explicit time from the RAN2 perspective, and to make sure SA2 doesn't take the task of defining an explicit time either. Can indicate to SA2 that we have the understanding it would be dynamic/configurable. Nokia would prefer to leave it to SA2/SA3; Huawei agree. Intel also agree.
- Ericsson think we should at least avoid indicating SA2 to come up with a number.
- Nokia: we asked SA3 to work on a solution for encrypting broadcast data, and they came back with questions about the requirements. But we don't know what the solution will be and we need to see more from them before talking about specific numbers.
- 
- Nokia wonder what the multiple subscription levels refer to. Is it that different UEs would have access to different data based on their capabilities?
- Ericsson think you could have different encryption keys for different parts of the assistance data, and different UEs have access to different parts of the data that way.
- Nokia wonder about what the "different parts" are. Ericsson: one subscription could allow everything except GNSS-RTK while another subscription allows RTK. Could also have different update rates.
- Huawei think we could put an example of the different subscription levels in the reply.
- Nokia think for SA3 we can just say there is a requirement, but within RAN2 it would be good to understand how to categorise the different broadcast data.
- Intel point out we might want to encrypt OTDOA assistance data for other reasons than subscription.
- On eNB specific information:
- Nokia think there could be "eNB specific" data that is not necessarily added at the eNB. E.g. for OTDOA.
- Qualcomm think of course there is eNB specific information in the broadcast, but the eNB does not need to add any information i.e. the assistance data can be opaque to the eNB, and they think this was the point of the question. They would prefer the ciphering to be done in the E-SMLC. Ericsson have the same understanding.

**The encryption of broadcasted assistance data should be performed at the E-SMLC if needed.**

**RAN2 shall response SA3's question as follow: [Yes, RAN2 requires a solution that supports multiple subscription levels. This would allow an encryption design solution in which that some UEs have access to all data and other UEs only can access a subset depending on which partition the UE belongs to.]**

**RAN2 shall acknowledge that the key change frequency needs to be a configurable parameter to handle the trade-off between information protection and key retrieval costs.**

**Proposal 3 RAN2 shall response SA3's question as follow: [No, there seems to be no particular information that needs to be added at the eNB. RAN2 shall ask SA3 to consider different alternatives of delivering the keys to the corresponding UEs, but shall include some information on the envisioned service protocols and architecture.]**

**Proposal 4 Send an LS [7] to SA3 about the above agreements and responses to their two questions.**

R2-1711292 draft LS on encrypting broadcasted positioning data Ericsson LS out Rel-15

- LS to be revised in R2-17xxxxx. Companies have the week to check the contents and we revisit on Friday.

- Draft an LS to RAN3 saying that RAN2 have determined encryption takes place in the server, and therefore LPPa needs a container for the encrypted assistance data.

R2-1711312 [DRAFT] Reply LS on encrypting broadcasted positioning data Huawei, HiSilicon LS  
out Rel-15 LCS\_LTE\_acc\_enh-Core

R2-1711295 draft LS on provisioning of positioning assistance data via LPPa for broadcast Ericsson  
LS out Rel-15

To be revised in R2-17xxxxx

R2-1711042 Broadcast of Positioning Assistance Data Qualcomm Incorporated discussion Rel-15  
LCS\_LTE\_acc\_enh-Core R2-1708539

For offline discussion [Ericsson, offline #502], including updating the LS to RAN3/CT4. Also including the outcome of the RTCM signalling discussion in the LS.

**Proposal 1:** Define a separate System Information Block (SIB) for each assistance data element specified in LPP (GNSS (incl. RTK), OTDOA).

**Proposal 2:** Support segmentation of large assistance data elements for each SIB.

**Proposal 3:** Support ciphering of the assistance data elements for each SIB.

**Proposal 4:** Define additional scheduling information in SIB1 for the generic GNSS assistance data elements (*GNSS-GenericAssistanceData* [12]) which includes the *GNSS-ID*, specifying the GNSS for which the data is applicable.

**Proposal 5:** Update LPPa [10] to provide the assistance data for broadcast from the E-SMLC to the eNBs.

**Proposal 6:** Update LCS-AP to provide the ciphering key(s) being used to the MME, which can then distribute the keys to suitably subscribed UEs using a mobility management procedure such as an Attach, Tracking Area Update and a Service Request.

#### *SIB design*

R2-1711650 Considerations of providing assistance data LG Electronics Inc. discussion Rel-15

R2-1711293 Positioning assistance data broadcasting Ericsson discussion Rel-15

R2-1711154 The positioning assistance data broadcasting CMCC discussion Rel-15  
LCS\_LTE\_acc\_enh-Core

R2-1711317 Discussion on the broadcasting of assistance data Huawei, HiSilicon discussion Rel-15  
LCS\_LTE\_acc\_enh-Core

R2-1711585 Broadcast A-GNSS assistance data Nokia, Nokia Shanghai Bell discussion Rel-15  
LCS\_LTE\_acc\_enh-Core

R2-1711294 GNSS assistance data via cellular networks for accurate positioning Ericsson  
discussion Rel-15

R2-1711318 Introduction of a single SIB for RTK positioning Huawei, HiSilicon draftCR Rel-15  
36.331 14.4.0 B LCS\_LTE\_acc\_enh-Core

R2-1711319 Introduction of multiple SIBs for RTK positioning Huawei, HiSilicon draftCR Rel-15  
36.331 14.4.0 B LCS\_LTE\_acc\_enh-Core

#### **Comeback on Friday**

**[CB 501]** R2-1711958 Draft LS on provisioning of positioning assistance data via LPPa for broadcast Ericsson

(NOTE: The content of CB 501 was changed after the session based on the offline discussion)

**[CB 502]** R2-1711959 Draft LS on encoding and encryption of positioning assistance data Ericsson

## Email discussion

- ☒ **[99bis#56][LTE/Positioning] Running LPP CR (Qualcomm)**  
Running LPP CR for positioning accuracy enhancements  
To update the running CR with outcomes of this meeting and the related offline discussions.  
Deadline: for February meeting
- ☒ **[99bis#57][LTE/Positioning] Future phase support of SSR (u-blox)**  
To converge on what SSR aspects can be supported in future phases, including what if any integrity information would be needed.  
Output: report to February meeting  
Deadline: for February meeting
- ☒ **[99bis#58][LTE/Positioning] Measurements for IMU positioning (Intel)**  
To identify the needed measurements to support IMU positioning, with goal of producing a consensus TP if possible.  
Deadline: for February meeting

## 9.9 Enhancing CA Utilization

(LTE\_euCA-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-170805)

Time budget: 1 TU

*Documents in this agenda item will be handled in a break out session*

### 9.9.1 General

*Including incoming LSs, work plan, rapporteur inputs, running CRs*

- R2-1710995 Stage-2 running CR      Nokia, Nokia Shanghai Bell      discussion      Rel-15      LTE\_euCA-Core
- => Adopt TP on section 10.1.3.2 and 7.5 in the running Stage-2 CR for euCA as shown in section 3.
  - => Update the running CR based on agreements during this meeting.

### 9.9.2 Delay reduction for SCell set-up

**From Idle to connected mode:**

- R2-1710996 Faster idle mode measurements      Nokia, Nokia Shanghai Bell      discussion      Rel-15  
LTE\_euCA-Core
- P1
- Qualcomm wonder how many frequencies can be measured in SIB5. Nokia think it should be further study with RAN4.
  - Intel think the bandwidth information can also be considered in SIB5.
  - LG think we also should consider the report configuration in SI.
  - Ericsson think the euCA capable UEs will not stop measuring without any new mechanism.
  - Huawei and Nokia think dedicated signalling is needed for some cases. Ericsson think it is necessary to use dedicated signalling to control specific UE.
- P4
- Nokia point the configuration stored is the major parameters.
  - Ericsson think the benefit is limited.
- P5
- Qualcomm and Intel prefer to left it to UE implementation.
  - Qualcomm think it is not possible to test the requirement.

Agreements:

- 1 The indication for which carrier(s) UE could do the IDLE measurements is included in SIB5 and dedicated RRC signalling (including the valid timer). FFS the value range of the timer.
- 2 UE indicates the availability of inter-frequency measurements in *RRConnectionSetupComplete* or *RRConnectionResumeComplete*

☞ **CB:** => LS is sent to request RAN4 to define measurements requirements if any for the measurement Darft LS in R2-1711946. (Offlien#111,Nokia)

R2-1711534 CA establishment from Idle and Suspended Ericsson discussion Rel-15  
LTE\_euCA-Core

=> Noted

R2-1710152 Fast SCell Configuration and Activation Through network assisted RRC\_Idle mode measurements Qualcomm India Pvt Ltd discussion Rel-15 LTE\_euCA-Core R2-1707788

R2-1710412 Down-selection of IDLE Mode Measurement Report alternatives for fast SCell set-up Huawei, HiSilicon discussion Rel-15 LTE\_euCA-Core

R2-1710414 Analysis on the Security issue of idle mode Measurement Report Huawei,HiSilicon discussion Rel-15 LTE\_euCA-Core

R2-1710901 IDLE mode measurement reporting for fast SCell set-up KT Corp. discussion

**Connected mode:**

R2-1710138 Fast SCell activation for enhanced CA utilization Qualcomm India Pvt Ltd discussion Rel-15 LTE\_euCA-Core R2-1707787

=> Noted

R2-1710997 Faster activation for Scells Nokia, Nokia Shanghai Bell discussion Rel-15  
LTE\_euCA-Core

=> Noted

The above two papers are discussed together.

- AT+T think Qualcomm proposals make sense.
- Huawei and LG concern the validity of the CSI report.
- Qualcomm point the report can be sync or async
- Intel concern how long UE perform the report is uncertain.
- Intel think it should be at first discussed in RAN1 to figure out the feasibility.

☒ **[99bis#32][LTE/euCA] Faster activation for Scells (Nokia)**

Discussion the pros and cons of the following solutions:

- 1) New state (R2-1710997)
  - 2) Direct activation at configuration
  - 3) Enhance the existing activation (R2-1711641)
- Other solutions can be included.

Identify the questions for asking RAN4 to progress the new state proposal. Attach the contribution R2-1710138

Intended outcome: Approved LS to RAN4 by 2017-10-26

=> The LS is approved in R2-1712079.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-11-09

R2-1711535 Direct activation at configuration Ericsson discussion Rel-15 LTE\_euCA-Core

R2-1711536 Measurement improvements for euCA Ericsson discussion Rel-15 LTE\_euCA-Core

R2-1710753 Initial status of SCell for enhancing CA utilization LG Electronics Mobile Research discussion  
LTE\_euCA-Core

R2-1711641 Delay reduction for SCell Activation Huawei, HiSilicon discussion Rel-15  
LTE\_euCA-Core



- R2-1710770 Draft LS to RAN1 and RAN4 about usage of L1 Signaling and timeline for SCell State Transition  
Qualcomm India Pvt Ltd LS out LTE\_euCA-Core
- R2-1710998 Draft LS to RAN4 on RAN2 agreements for enhanced CA utilization WID Nokia, Nokia  
Shanghai Bell discussion Rel-15 LTE\_euCA-Core

### 9.9.3 Signalling overhead reduction for configuration activation

- R2-1710999 Common SCell configuration Nokia, Nokia Shanghai Bell discussion Rel-15  
LTE\_euCA-Core
- R2-1710154 Signalling Optimization for SCell Configuration and Handover Qualcomm India Pvt Ltd  
discussion Rel-15 LTE\_euCA-Core R2-1707789
- R2-1710411 Signalling overhead reduction for SCell (de)Activation Huawei, HiSilicon discussion  
Rel-15 LTE\_euCA-Core R2-1708549
- R2-1711000 Draft LS to RAN3 on RAN2 agreements for enhanced CA utilization WID Nokia, Nokia  
Shanghai Bell discussion Rel-15 LTE\_euCA-Core
- R2-1711457 Signalling overhead reduction for SCell Configuration Huawei, HiSilicon discussion  
Rel-15 LTE\_euCA-Core

### 9.9.4 Others

## 9.10 Enhancements on LTE-based V2X Services

(LTE\_eV2X-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171740)

Time budget: 1 TU

*Documents in this agenda item will be handled in a break out session*

### 9.10.1 General

*Including incoming LSs, work plan and rapporteur inputs.*

- R2-1710014 LS on RAN1 agreements on mode 3 sidelink CA (R1-1715174; contact: HiSilicon) RAN1 LS in  
Rel-15 LTE\_eV2X To:RAN2  
⇒ Noted
- R2-1710017 LS to RAN2 on supported use case for Rel-15 V2X CA on PC5 (R1-1715282; contact: Huawei)  
RAN1 LS in Rel-15 LTE\_eV2X-Core To:RAN2  
⇒ Noted
- R2-1710018 LS to RAN on PC5 operation with short TTI for V2X phase 2 based on LTE (R1-1715287;  
contact: Huawei, CATT) RAN1 LS in Rel-15 To:RANcc:RAN2, RAN4  
⇒ Noted
- R2-1710061 Reply LS on support of CACC and platooning applications by 3GPP systems (S1-173531;  
contact: LGE) SA1 LS in Rel-15 eV2X To:SAE DSRC Technical Committee  
Cc:SA2, RAN2, RAN1, SAE Cellular V2X Technical Committee  
⇒ Noted
- R2-1710066 LS on FS\_REAR study outcome (S2-176446; contact: Huawei) SA2 LS in Rel-15  
FS\_feD2D\_IoT\_relay\_wearable, FS\_REAR To:RAN, RAN1, RAN2, RAN3 Cc:SA3, CT1  
- Handled in FeD2D session

## 9.10.2 Carrier aggregation (up to 8 PC5 carriers)

*Focus should be on RAN2 aspects.*

*Support of use case 2?*

*How to handle limited Rx chains?*

*Including output from email discussion [99#48][eV2X] Selection of Tx carriers (Huawei)*

Carrier selection in CA:

R2-1710089 Summary of [99#48][eV2X] Selection of Tx carriers Huawei, HiSilicon discussion  
Rel-15 LTE\_eV2X-Core

⇒ Agreed with proposal 1: CBR should be considered for the UEs' Tx carrier selection in PC5 CA from RAN2 perspective.

⇒ Agreed with proposal 2: Priority indicated by PPPP should be considered for the UE's Tx carrier selection in PC5 CA from RAN2 perspective.

Proposal 3: RAN2 is suggested to further discuss whether Required Reliability and/or Required Data Rate of the V2X packets to be transmitted should be considered for the UE's Tx carrier selection in PC5 CA.

- ZTE: Reliability should be considered and it may not be associated with PPPP.
- Huawei: Agree with reliability aspect.
- CATT: No need to consider data rate.
- Samsung: Reliability and PDB should be considered together.
- LG: Agree with data rate, but no reliability.
- ZTE: How many carriers should be also considered?

⇒ Not closed for other factors

⇒ Agreed with proposal 4: AS is aware of candidate V2X frequencies for V2X packet transmissions, which configured by upper layers (Same as Rel-14). FFS on the additional need in Rel-15.

- LG: In REL-14, the mapping is already done by upper layer so no need to consider service type in AS
- OPPO: Whether AS is aware of that is more second question, and no see AS impact.
- Nokia: AS should NOT be aware of service type.

⇒ Agreed with proposal 5: UE capability on PC5 CA should be considered for the UE's Tx carrier selection from RAN2 perspective. However no additional specification impacts are foreseen at the moment.

- OPPO: Agreed. However what should be impacts to RAN2 for mode4? Probably no further impacts on specification.

⇒ Agreed with Proposal 6: Configuration/Preconfiguration of PC5 carriers (at least one candidate set of PC5 CC) for the UE's Tx carrier selection (like Rel-14). FFS if further standard changes (including UE behaviors) are needed for Rel-15 eV2X.

- Proposal 7: RAN2 is suggested to further discuss whether a PCC needs supporting for the Tx carrier selection in PC5 CA.
- Proposal 7a: RAN2 is suggested to further discuss whether a set of SCC needs supporting for the Tx carrier selection in PC5 CA.

⇒ From RAN2 point of view we do NOT need a PCC and SCC.

- Proposal 8: The Uu-like SCell activation/deactivation mechanism is not needed for UEs' Tx carrier selection in PC5 CA.
- ⇒ No need of activation/deactivation mechanism for carriers.
- ZTE: For unicast, it may be needed.
- Ericsson: No need. For mode3, anyway NW will control. For mode4, it's UE behaviour, so no need. Samsung: Agrees with Ericsson LG: Agrees with Ericsson
- Proposal 9: PC5 CCs may not need configuring/associating with a priority order that explicitly defines the order in which Tx/Rx carriers are selected by UEs. FFS whether some other forms of order for the Tx/Rx carrier selection are needed.
- Proposal 10: RAN2 is suggested to further discuss whether Rx carrier selection is needed for UEs with limited Rx capability for PC5 CA, by taking into account the key issue in Observation 1.
- ⇒ FFS on how to handle Rx limited V2X UE.
- Samsung: For safety carrier, the UE will follow the frequency configured by upper layer, for non-safety carrier, it is up to UE.
- Ericsson: The UE follows mapping information between service types and frequencies regardless of safety or non-safety.
- Qualcomm: we should consider very Rx limited V2X UE, but it is not related with safety and non-safety.

Agreements:

- 1: CBR should be considered for the UEs' Tx carrier selection in PC5 CA from RAN2 perspective.
- 2: Priority indicated by PPPP should be considered for the UE's Tx carrier selection in PC5 CA from RAN2 perspective. Not closed for other factors.
- 3: AS is aware of candidate V2X frequencies for V2X packet transmissions, which configured by upper layers (Same as Rel-14). FFS on the additional need in Rel-15.
- 4: UE capability on PC5 CA should be considered for the UE's Tx carrier selection from RAN2 perspective. However no additional specification impacts are foreseen at the moment.
- 5: Configuration/Preconfiguration of PC5 carriers (at least one candidate set of PC5 CC) for the UE's Tx carrier selection (like Rel-14). FFS if further standard changes (including UE behaviors) are needed for Rel-15 eV2X.
- 6: From RAN2 point of view we do NOT need a PCC and SCC.
- 7: No need of activation/deactivation mechanism for carriers.
- 8: FFS on how to handle Rx limited V2X UE.

**[CB: 600]** LS to RAN1 on the agreements on carrier and resource selection in CA (LG, R2-1711995)

R2-1710085	Discussion on the Tx carrier selection for PC5 CA	Huawei, HiSilicon	discussion	Rel-15
	LTE_eV2X-Core			
R2-1710086	On UEs with limited Rx capability in PC5 CA	Huawei, HiSilicon	discussion	Rel-15
	LTE_eV2X-Core			
R2-1710146	Carrier selection in CA-based eV2x	OPPO	discussion	Rel-15
R2-1710171	Discussion on Carrier Set Configuration for PC5 CA in eV2X in Mode-3	OPPO	discussion	Rel-15
	R2-1708040			
R2-1710684	Carrier Aggregation for V2X Phase 2	Qualcomm	Incorporated discussion	Rel-15
	LTE_eV2X-Core			
R2-1710714	Carrier selection mechanism in eV2X	CATT	discussion	
R2-1710894	Discussion on activation of V2X carrier aggregation	Nokia, Nokia Shanghai Bell	discussion	Rel-15
	Rel-15			
	LTE_eV2X-Core			
R2-1711011	Discussion on carrier selection in PC5 CA	ZTE Corporation	discussion	Rel-15
	LTE_eV2X-Core			

R2-1711493	Sidelink Carrier Selection Criteria	Ericsson	discussion	Rel-15	LTE_eV2X-Core
R2-1711494	On the Need of Sidelink PCell and SCell	Ericsson	discussion	Rel-15	LTE_eV2X-Core
R2-1711693	Consideration on limited Rx capability	LG Electronics Inc.	discussion	Rel-15	LTE_eV2X-Core
R2-1711694	Layer design aspect for carrier selection	LG Electronics Inc.	discussion	Rel-15	LTE_eV2X-Core

Use case 2:

R2-1711013	Discussion on data duplication for PC5	CAZTE Corporation	discussion	LTE_eV2X-Core
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|------------|--|-----------------------------|------------|--------|---------------|
| R2-1710685 | Carrier Aggregation Use Cases in V2X Phase 2 | Qualcomm Incorporated, CATT | discussion | Rel-15 | LTE_eV2X-Core |
|------------|--|-----------------------------|------------|--------|---------------|
- Huawei: High reliability (99.999) is not only for remote driving but also for two additional cases (advance driving and sensor sharing).
  - Nokia: It is not deprioritized in RAN1, it mainly impacts on RAN2, so just leave it to RAN2 to make a decision.
  - LG: Same view with Qualcomm. System point of view, it may not be good, e.g. congestion, and it may harm Rel-14 V2X UEs also, so it may not be beneficial.
  - Samsung: Support Huawei since high reliability is one of main motivation of this WI. No HARQ A/N, ARQ so we need it.
  - OPPO: No free lunch for reliability and reliability is one of WI scope
  - Ericsson: It can be even helpful for limited Rx V2X UEs.
  - Nokia: Share view with Ericsson but it won't be default behaviour, we should specify conditions.
  - Huawei: Agrees with Nokia/Ericsson and also NW can control when to (de)activate.
  - ITL: We should think of use-case requiring the high reliability, so it will be helpful.
- Checking companies' views:  
 No need of packet duplication: 3  
 Need of packet duplication: 9

⇒ Agreed with the need of packet duplication

Agreements:  
 1: Agreed with the need of packet duplication

R2-1710084	Packet duplication for PC5 CA	Huawei, HiSilicon	discussion	Rel-15	LTE_eV2X-Core
R2-1710147	Packet duplication in CA-based eV2x	OPPO	discussion	Rel-15	LTE_eV2X-Core
R2-1710650	Packet duplication for CA-based eV2x	Intel Corporation	discussion	Rel-15	LTE_eV2X-Core
R2-1711496	Packet duplication for PC5	Ericsson	discussion	Rel-15	LTE_eV2X-Core
R2-1711685	Consideration on packet duplication	LG Electronics Inc.	discussion	Rel-15	LTE_eV2X-Core
R2-1711812	Packet Duplication for the Sidelink Carrier Aggregation	Samsung R&D Institute UK	discussion		
R2-1710083	Consideration on resource allocation for PC5 CA	Huawei, HiSilicon	discussion	Rel-15	LTE_eV2X-Core

Resource selection in CA:

R2-1711399	Modelling sidelink parallel transmissions for V2X communication	LG Electronics Inc.	discussion	Rel-15	LTE_eV2X-Core
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- ⇒ Agreed with proposal 1: As in the legacy specification, one resource pool is associated to a single carrier only.
  - Ericsson: Agrees
  - Nokia: Is it RAN2 issue? LG: It is RAN2 issue
- ⇒ Agreed with proposal 2: For parallel transmissions on different carriers, UE RRC selects different pools on different carriers, UE MAC performs resource (re-)selection on each selected pool.

Agreements:  
 1: As in the legacy specification, one resource pool is associated to a single carrier only.  
 2: For parallel transmissions on different carriers, UE RRC selects different pools on different carriers, UE MAC performs resource (re-)selection on each selected pool.

- ⇒ Above agreements will be also captured into R2-1711995.

Carrier reselection:

R2-1710145 Resource selection in CA-based eV2x OPPO discussion Rel-15 LTE\_eV2X-Core  
 R2-1710651 Carrier selection for CA over PC5 Intel Corporation discussion Rel-15 LTE\_eV2X-Core

SPS in CA:

R2-1710716 SPS in eV2X when CA is configured CATT discussion  
 R2-1711775 Discussion on SPS support with enhanced Carrier Aggregation Samsung R&D Institute UK  
 discussion R2-1709624

### 9.10.3 Radio resource pool sharing between UEs using mode 3 and mode 4

*Focus should be on RAN2 aspects.*

Scenarios:

R2-1710148 Resource pool sharing in eV2x OPPO discussion Rel-15 LTE\_eV2X-Core  
 R2-1710088 On resource pool sharing between R15 UEs and R14 UEs Huawei, HiSilicon discussion  
 Rel-15 LTE\_eV2X-Core  
 R2-1710652 Resource pool sharing between mode 3 and 4 Intel Corporation discussion Rel-15 LTE\_eV2X-Core  
 R2-1710895 Resource pool sharing between mode 3 and mode 4 Nokia, Nokia Shanghai Bell  
 discussion Rel-15 LTE\_eV2X-Core

Solutions:

R2-1710087 Discussion on resource pool sharing between mode3 and mode4 UEs Huawei, HiSilicon  
 discussion Rel-15 LTE\_eV2X-Core R2-1707969  
 R2-1711497 Pool sharing between mode 3 and mode 4 Ericsson discussion Rel-15 LTE\_eV2X-Core  
 R2-1710682 Resource pool sharing between Mode 3 and Mode 4 Qualcomm Incorporated discussion  
 Rel-15 LTE\_eV2X-Core R2-1708681  
 R2-1710715 Discussion on mode 3 and mode 4 shared resource pool CATT discussion  
 R2-1710787 Discussion on resource pool sharing between mode 3 and mode 4 UEs Samsung Electronics  
 France SA discussion Rel-15 R2-1709008  
 R2-1711014 Consideration on resource pool sharing between UEs using mode 3 and mode 4 ZTE  
 Corporation discussion LTE\_eV2X-Core R2-1708510  
 R2-1711684 Radio resource pool sharing between UEs using mode 3 and UEs using mode 4 LG  
 Electronics Inc. discussion Rel-15 LTE\_eV2X-Core R2-1709133

- R2-1711733 Discussion about exceptional pool for resource pool sharing between UEs using mode 3 and UEs using mode 4 Samsung R&D Institute UK discussion Rel-15 LTE\_eV2X-Core R2-1708297
- R2-1711749 Supporting reliability during resource sharing Samsung R&D Institute UK discussion R2-1709430
- R2-1711754 Mode3/Mode 4 resource pool sharing on V2X phase 2 Samsung R&D Institute UK discussion

## 9.10.4 Others

*Including RAN2 aspects, if any, on the WI objectives 1b (64 QAM), 1c (delay reduction at layer 1), 2 (transmit diversity), and 3 (short TTI).*

Latency reduction:

- R2-1711495 Latency reduction for eV2V Ericsson discussion Rel-15 LTE\_eV2X-Core
- R2-1710090 Consideration on latency related aspects in LTE eV2X Huawei, HiSilicon discussion Rel-15 LTE\_eV2X-Core
- R2-1710150 Latency reduction in eV2x OPPO discussion Rel-15 LTE\_eV2X-Core
- R2-1710683 Reduction of time between packet arrival and transmisison Qualcomm Incorporateddiscussion Rel-15 LTE\_eV2X-Core R2-1708683
- R2-1711015 Consideration on latency reduction ZTE Corporation discussion LTE\_eV2X-Core
- R2-1711744 Latency reduction on V2X phase 2 for UEs using Mode 4 Samsung R&D Institute UK discussion R2-1709427

Others:

- R2-1710149 Resource selection for sTTI in eV2x OPPO discussion Rel-15 LTE\_eV2X-Core R2-1707702
- R2-1711016 Discussion on support of 64QAM over sidelink ZTE Corporation discussion LTE\_eV2X-Core R2-1708512
- R2-1711686 RAN2 aspects regarding support of 64QAM and TX diversity LG Electronics Inc. discussion Rel-15 LTE\_eV2X-Core
- R2-1711759 SPS enhancements for V2X phase 2 Samsung R&D Institute UK discussion

## 9.11 High capacity stationary wireless and 1024 QAM

*(LTE\_1024QAM\_DL-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Mar. 18: WID: RP-171738)*

*Time budget: 0.5 TU*

*Documents in this agenda item will be handled in a break out session*

### 9.11.1 General

*Including incoming LSs, work plan, rapporteur inputs, running CRs*

### 9.11.2 UE capability and potential new categories

### 9.11.3 Corresponding higher-layer procedures and signalling

## 9.12 Enhancements to LTE operation in unlicensed spectrum

*(LTE\_unlic-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-170848)*

*Time budget: 1 TU*

*Documents in this agenda item will be handled in a break out session*

## 9.12.1 General

*Including incoming LSs, work plan, rapporteur inputs, running CRs*

R2-1710013 LS on RAN1 agreements on Enhancements to LTE operation in unlicensed spectrum (R1-1715080; contact: Nokia) RAN1 LS in Rel-15 LTE\_unlic To:RAN2

=> Noted

R2-1711066 Summary status of LT\_unlic-Core and stage-2 TP draft Nokia discussion Rel-15 LTE\_unlic-Core To:RAN, RAN1, RAN2, RAN3 Cc:SA3, CT1

R2-1711943 How to progress proposal (after seeing all the papers submitted to the meeting) Nokia discussion Rel-15 LTE\_unlic-Core

=> Noted

- Huawei think zero-bit is enough.
- Moto support multi-bit solution.
- Intel think the confirmation is not needed.
- Qualcomm and LG support multi-bit MAC CE.
- Intel wonder the meaning of "SPS scheme".
- Qualcomm and Intel think RAN1 should take the decision.

Regarding R2-1710364:

- LG observe the similar problem but consider other solution.
- Huawei indicate the motivation is to guarantee the fairness.

Regarding "AUL transmissions can be restricted to a subset of logical channels by RRC configuration"

- Intel and Huawei think it is not needed.
- LG support the restriction.
- Ericsson think the proposal is beneficial. Nokia support the proposal.
- Huawei think it can be left to eNB implementation.

Regarding R2-1710367 and R2-1710649:

- Qualcomm think we don't need to change LCP.

Regarding R2-1711498

- Huawei wonder the reason to introduce the time window.
- Moto think we need a timer.
- Huawei think we can introduce a maximum retransmission counter to address the issue. Moto and LG think counter cannot work.

Agreements:

- 1 The UE will send a confirmation for activation/deactivation of AUL on MAC CE. if multi-bit or zero-bit is FFS.
- 2 Not introduce data threshold to skip UL grant. Can be revisited if RAN1 have different understanding.
- 3 AUL transmissions can be restricted to a subset of logical channels. FFS introduce new IE or reuse existing signaling.
- 4 LCP procedure is not modified.
- 5 In the LAA autonomous UL access, HARQ processes are not tied to TTIs.
- 6 HARQ retransmissions of a certain transport block shall avoid issues with the RLC reordering procedures. FFS on how to solve this issue.

☞ **CB:** => Draft LS in R2-1711949 to RAN1 to inform our progress. Highlight the agreement 4 which is not aligned with RAN1 agreements. (offline discussion #666, Ericsson)

## 9.12.2 Autonomous uplink access on Frame structure type 3

**AUL activation/deactivation:**

R2-1710649 Other aspects on AUL Intel Corporation discussion Rel-15 LTE\_unlic-Core

=> Noted

- R2-1710363 Confirmation on AUL activation and deactivation Huawei, HiSilicon discussion Rel-15 LTE\_unlic-Core
- R2-1711736 Further details of Autonomous Uplink Access for eLAA Qualcomm Incorporated discussion

**Configuration of SPS:**

- R2-1711207 Resource allocation for AUL Nokia discussion Rel-15 LTE\_unlic-Core
- R2-1711488 Autonomous Uplink Access for LAA Ericsson discussion Rel-15 LTE\_unlic-Core

**UL skipping:**

- R2-1710364 Threshold for AUL in FeLAA Huawei, HiSilicon discussion Rel-15 LTE\_unlic-Core
- => Noted

**Multiplexing:**

- R2-1710367 Multiplexing of data for AUL Huawei, HiSilicon discussion Rel-15 LTE\_unlic-Core
- => Noted

**HARQ:**

- R2-1711489 HARQ Design for Autonomous UL Access Ericsson discussion Rel-15 LTE\_unlic-Core
- => Noted
- R2-1710368 HARQ with autonomous uplink access on LAA SCell Huawei, HiSilicon discussion Rel-15 LTE\_unlic-Core
- P1:
- Nokia wonder the meaning of high priority.
  - Ericsson think it is not needed.
- => Noted
- R2-1710648 HARQ aspect on AUL Intel Corporation discussion Rel-15 LTE\_unlic-Core
- R2-1710366 MAC aspects of autonomous uplink access Huawei, HiSilicon discussion Rel-15 LTE\_unlic-Core
- R2-1711208 LAA HARQ operation Nokia discussion Rel-15 LTE\_unlic-Core
- R2-1710365 Issues related to SR in FeLAA Huawei, HiSilicon discussion Rel-15 LTE\_unlic-Core
- R2-1711490 Channel Access Priority Classes for feLAA Ericsson discussion Rel-15 LTE\_unlic-Core

**9.12.3 Other operation on Frame structure type 3**

- R2-1711491 RAN2 Impact on Multiple Starting and Ending Positions in a Subframe Ericsson discussion Rel-15 LTE\_unlic-Core
- => Not treated.

**9.12.4 Others**

**9.13 Further NB-IoT enhancements**

(NB\_IOTenh2-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-172063)



Time budget: 1 TU

*Documents in this agenda item will be handled in a break out session*

*Some sub-items in 9.13 and 9.14 may be treated jointly.*

### Incoming LS

R2-1710020 LS on narrowband measurement accuracy enhancement (R1-1715300; contact: Huawei) RAN1  
LS in Rel-15 NB\_IOTenh2 To:RAN4 Cc:RAN2

- Ericsson think this is for the December CRs. Huawei think not.

⇒ **noted**

R2-1710021 LS on TDD NB-IoT (R1-1715301; contact: Huawei) RAN1 LS in Rel-15 NB\_IOTenh2  
To:RAN2

- QC wonders what is meant by bullet 1. Huawei understand that this is the minimum contents kept on the anchor carrier and all the rest can be considered for other carriers.

⇒ **will take this into account**

⇒ **noted**

R2-1710034 LS on UE differentiation of NB-IOT (R3-173401; contact: ZTE) RAN3 LS in Rel-15  
NB\_IOTenh2-Core To:SA2 Cc:RAN2

⇒ **noted**

## 9.13.1 Early Data Transmission

*Early Data transmission for NB-IoT is treated jointly with MTC under AI 9.14.2. Do not use this AI for any item that can be discussed jointly.*

## 9.13.2 System Acquisition Enhancements

*System acquisition Enhancements for NB-IoT is treated jointly with MTC under AI 9.14.3. Do not use this AI for any item that can be discussed jointly.*

*At the meeting it was anyway decided to treat NB-IoT documents separately and they were moved to this AI from 9.14.3.*

R2-1711334 System information acquisition enhancements for NB-IoT Huawei, HiSilicon, Neul discussion  
Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core

Proposal 1: Wait for RAN1 to conclude on Enhancement(s) to MIB-NB.

Proposal 2: SIB1-NB accumulation across multiple modification periods can be left to UE implementation.

Proposal 3: No new mechanism is needed to allow skipping SIB1-NB and SI messages reading.

Proposal 4: No new mechanism is needed to allow skipping MIB-NB reading.

Proposal 5: Wait for RAN1 to conclude on additional SIB1-NB transmissions.

Proposal 6: Wait for RAN1 to conclude on the use of the new physical signal/channel.

Proposal 7: Wait for RAN1 to conclude on enhancements for other SIBx-NB.

### DISCUSSION

- Vodafone wonders what happens when the UE moves to another cell, e.g. due to change of radio conditions (maybe not by UE moving). Huawei think that the UE may have stored information for the neighbour cell, and that the UE will read the value tag and used the stored information.
- Chair observes that except for P3 there seems to be no serious objections to the proposals in this paper.

P3

- ZTE think we may consider some new mechanism. Huawei think that if so, we should discuss the mechanism now, as it should be ready for December. ZTE think that their proposal for eMTC can be considered for NB-IoT as well

P4

- Huawei think that the UE re-read of MIB-NB in the same cell is related to UE internal clock accuracy or for access.

⇒ **noted**

R2-1711651 Clarification of parameters for skipping MIB-NB LG Electronics Inc. discussion Rel-15

**DISCUSSION**

- Intel think that UE anyway need to read MIB for SFN sync. Huawei think that MIB reading may be required to understand whether other configuration than paging has changed.
- Vodafone think that after introduction, more or less all SI will be mostly static, and only change at network extension, or SW upgrade etc.
- LG explains that the intention is to avoid reading MIB at access. Huawei wonders if the proposal means that this need to be transmitted in all PO during the time duration of access barring. Huawei think this should be avoided,
- Gemalto think that MIB anyway need to be read, as the AB may have changed since the last PO. Huawei agrees that the UE normal POs should not be used for this kind of function

⇒ **Not much support**

⇒ **Noted**

R2-1711826 NB-IoT\_UE SI on demand Vodafone Group Plc. Discussion

- The main proposal is to provide also SI of neighbour cells (by dedicated signalling), so UE doesn't need to acquire it at mobility.
- LG think there are lots of open questions on the details.
- Ericsson wonders how the network knows to which UEs this is sent
- Vodafone think that the algorithm can be worked on, but the network should know which UEs that could need this.
- QC wonders if the UE would need to indicate for which cells the UE would need this.
- Veolia appreciates this and think it should be further studied
- Sierra Wless think this is interesting but have concerns on the capacity impact on the system. Vodafone think that DL capacity is not a problem
- QC wonder if this is always piggybacked on other transmissions. Vodafone think this can be always piggybacked.

⇒ **Noted**

R2-1710794 Skipping MIB-NB Acquisition for NB-IOT UE MediaTek Inc. discussion

### 9.13.3 Relaxed Monitoring for cell reselection

*Relaxed monitoring for cell reselection for MTC and NB-IoT is treated jointly under this AI.*

*Including output from email discussion [99#41][NB-IoT/MTC] Measurement relaxation (Ericsson)*

R2-1710727 Email report 99\_41 Measurement relaxation Ericsson report Rel-14 NB\_IOTenh-Core

*Proposal 1: RAN2 to discuss using change in serving cell RSRP or in change in cell count for relaxed monitoring.*

*Proposal 2a: Relaxed monitoring is configured by means of system information.*

*Proposal 2b: Relaxed monitoring for stationary UE can be configured by means of device configuration.*

*Proposal 2c: RAN2 to discuss the need for signalling for device configuration for stationary UE*

*Proposal 3: The UE is required to perform periodic neighbour cell measurements with a period indicated in system information when the UE is below the measurement threshold and the*

*relaxed monitoring condition is fulfilled (aka the UE is “stationary” either through device configuration or mobility detection in the UE, see proposal 1 above).*

*Proposal 4a: The UE is required to perform intra-frequency measurements when the UE is below the intra-frequency measurement threshold, unless the relaxed monitoring condition is fulfilled.*

*Proposal 4b: The UE is required to perform inter-frequency measurements when the UE is below the inter-frequency measurement threshold, unless the relaxed monitoring condition is fulfilled.*

*Gemalto Would like to treat true stationary devices somewhat separately to enable additionally aggressive power saving.*

#### DISCUSSION:

On Proposal 1: How to dynamically determine whether relaxation applies or not

- Proposals on the table
  - A: change in serving cell RSRP
  - B: change in cell count
  - C: leave it to UE implementation.
- Mediatek proposes to make this UE implementation, i.e. to not capture the detail detection in the 3GPP TSes. Huawei think this is not a good idea. QC agrees that C will make this non-testable and do not support this. Ericsson think that alt C is not acceptable.
- Huawei wonders if option B is really a separate option as it can be used as entering criterion but not as exit criterion. Gemalto agrees, but think there is no R4 accuracy requirements for RSRP (for MTC). Nokia think there are requirements but they are not very stringent so it is not clear how the RSRP change can be properly configured.
- Chair think maybe we need to ask R4. Ericsson think we should not ask R4 except towards the end to define requirements for test cases.
- Nokia think that cell change count can be used both for exit and entering criterion, as the UE will can anyway do cell change based on cell selection done at UE RRC release. Huawei think that the purpose is to trigger or not trigger cell reselection and it will not work if based on cell change, cell reselection should be triggered before UE lose coverage. Mediatek also think that cell change count doesn't work as for M2M the UE cell change count is anyway unreliable as the UE can move while asleep. LG agrees that the UE should trigger cell reselection before losing coverage completely and think that cell count cannot work.
- Huawei and LG think that at low speeds it is really difficult to use the cell change count, and this doesn't work. ZTE think that cell change count is used in LTE today and works. ZTE further think that the RSRP delta value should be smaller in the cell edge than at cell center. Mediatek wonders how many thresholds that would be needed.
- Sierra Wireless think that A can be used with low complexity and that it can be useful even though not perfect. Veolia agrees with Sierra Wireless, and cannot understand how cell count can work, and could also accept C.

Show of hands

A: 9  
B: 3

- we consider option C only a last resort, the level of support seems low.

Proposal 2a: Relaxed monitoring is configured by means of system information.

Proposal 2b: Relaxed monitoring for stationary UE can be configured by means of device configuration.

Proposal 2c: RAN2 to discuss the need for signalling for device configuration for stationary UE

- Ericsson explains that for 2a is to broadcast thresholds etc for the detection algorithm discussed in Proposal 1 above, for dynamic determination whether relaxation applies.
- Nokia wonders if the intention of 2a is to allow/disallow relaxation. Chair think this is about providing cell specific configuration parameters.
- Gemalto think that 2a is reasonable but maybe something else is needed for stationary devices. SWless think that 2a is reasonable, also fixed parameters could be ok, but they are concerned about the prospect of device configuration.
- LG also think that 2b can be considered, as some UEs will always be fixed.
- ZTE think we cannot decide on 2a until we have decided the scheme. Nokia support to agree on the modified 2a.

Proposal 2b: Relaxed monitoring for stationary UE can be configured by means of device configuration.

Proposal 2c: RAN2 to discuss the need for signalling for device configuration for stationary UE

- On the table regarding 2b and 2c
  - o Authorization to use relaxed monitoring
  - o Device configuration instead of dynamic determination whether to use relaxed monitoring.
- Chair think that UEs need to be authorized to apply relaxed monitoring.
- Sierra wireless think that there are different cases, e.g. a) normal UEs (LTE), b) M2M UEs that are stationary often but moves sometimes, c) really fixed stationary UEs.
- Huawei think that NAS signalling is complex and that device configuration could be a method to get such functionality early.
- Ericsson point out that even if the UE is truly stationary measurements, cannot be completely turned off.
- Nokia think that dynamic determination is sufficient and device configuration is not needed.

Proposal 3: The UE is required to perform periodic neighbour cell measurements with a period indicated in system information when the UE is below the measurement threshold and the relaxed monitoring condition is fulfilled (aka the UE is “stationary” either through device configuration or mobility detection in the UE, see proposal 1 above).

- Chair wonders if the intention with 3, 4a, 4b is that Sintrasearch, Sintersearch works as today. ZTE agrees,
- Huawei and Ericsson think that this is a very slow mechanism to cover for e.g. network changes (new eNB) or if the dynamic determination doesn't perform perfectly.
- Sierra wireless think that periodicity could be a problem as some UEs are required to communicate very rarely, e.g. once every other day, and even a slow periodicity could impact the UE power consumption negatively. Veolia agrees and think that the periodicity need to be adapted to the use case, and this might need to be adapted per UE. QC think the measurements doesn't apply to PSM mode.
- Nokia think P3 is not needed.
- ZTE think that there should be several grades of “relaxed monitoring” to be used in different mobility states.
- Chair understands that the UE either applies “normal mobility requirements” or “relaxed monitoring”.
- Nokia would not like to signal dedicated configuration to the UE, e.g. for the slow time scale. Ericsson think this could be in system information.
- Nokia think authorization to use relaxed monitoring is not needed.

Do we treat true stationary devices somewhat separately to enable additionally aggressive power saving?

- Huawei think that the same relaxed monitoring would be used
- Gemalto can accept option A for the sake of progress. Nokia also think option A can work but are afraid of R4 impact.

⇒ **Working assumption (change only if blocking problems are found): The UE dynamically determines whether to apply relaxed monitoring by change in serving cell RSRP**

⇒ **If there are configuration parameters for the dynamic determination whether to apply relaxed monitoring, those are provided by means of system information.**

⇒ **The functionality of Sintrasearch and Sintersearch is assumed as today, and “relaxed monitoring” is applicable when the UE is below Sintrasearch or Sintersearch thresholds respectively, if configured.**

⇒ **UEs that apply “relaxed monitoring” need to perform neighbour cell measurements on a slow time scale, regardless if the UE considers itself to be stationary. An intention is that this shall not make it worse for any case w.r.t. power consumption.**

⇒ **It is FFS what is the slow time scale and whether it is same or different for different UEs.**

- ⇒ UE either applies for neighbour cell measurements “normal mobility requirements” or “relaxed monitoring requirements”.
- ⇒ It is FFS if and how UE is Authorized to/Configured to use relaxed monitoring (at all).
- ⇒ We send an LS to R4 to inform on progress.

Draft LS to RAN4 on measurement relaxation (Ericsson), Offline discussion 209, Draft in R2-1711890.

- R2-1711890 Draft LS to RAN4 on measurement relaxation (Ericsson)
- Nokia think we should indicate that for NB-IoT we intend to have rel-14 CRs.
  - Huawei think we should remove the word “running”
- Revised in R2-1711894, take comments into account.,
- R2-1711894 Draft LS to RAN4 on measurement relaxation (Ericsson)
- ⇒ **Approved, final version in R2-1711897**
- R2-1711652 Determination of stationary UE in NB-IoT LG Electronics Inc. discussion Rel-15
- LG proposes using serving cell RSRP to determine if to apply relaxation or not.
- ⇒ **noted**
- R2-1710728 Relaxed Monitoring in NB-IoT Ericsson discussion Rel-14 NB\_IOTenh-Core  
R2-1708273
- Adds more detail to the questions raised in the email discussion.
- ⇒ **noted**
- R2-1710151 Relaxed monitoring for NB-IoT Gemalto N.V. discussion
- Would like to treat true stationary devices somewhat separately to enable additionally aggressive power saving. Veolia support
- ⇒ **noted**
- R2-1710904 Further consideration on relaxed monitoring for cell reselection in FeNB-IoT and eFeMTC ZTE  
Wistron Telecom AB discussion Rel-15 NB\_IOTenh2-Core
- one of the main points is related to determination whether relaxation is applicable, see complexity with RSRP mechanism as it is difficult to configure a good trigger value.
- ⇒ **noted**
- R2-1710732 Relaxed monitoring in MTC Ericsson discussion Rel-15 LTE\_eMTC4-Core  
R2-1708278
- Chair confirms that R2 will have same or similar solutions as far as reasonable per previous agreement.
- ⇒ **noted**

**Draft CRs**

- R2-1711321 Introduction of relaxed monitoring for NB-IoT in 36.304 Huawei, HiSilicon CR Rel-  
14 36.304 14.4.0 0384 - C NB\_IOTenh-Core, TEI14 R2-1708306
- R2-1711322 Introduction of relaxed monitoring for NB-IoT in 36.306 Huawei, HiSilicon CR Rel-  
14 36.306 14.4.0 1492 - C NB\_IOTenh-Core, TEI14 R2-1708307
- R2-1711323 Introduction of relaxed monitoring for NB-IoT in 36.331 Huawei, HiSilicon CR Rel-  
14 36.331 14.4.0 2987 - C NB\_IOTenh-Core, TEI14 R2-1708308
- R2-1710162 Introduction of relaxed monitoring in NB-IoT Gemalto N.V. CR Rel-14 36.304  
14.4.0 0389 - B NB\_IOTenh-Core

R2-1710164	Introduction of relaxed monitoring in NB-IoT 14.4.0 1509 - B NB_IOTenh-Core	Gemalto N.V.	CR	Rel-14	36.306
R2-1710165	Introduction of relaxed monitoring in NB-IoT 14.4.0 3074 - B NB_IOTenh-Core	Gemalto N.V.	CR	Rel-14	36.331
R2-1710729	Introduction of relaxed monitoring in NB-IoT in 36.304 14.4.0 B NB_IOTenh-Core	Ericsson		draftCR	Rel-14
R2-1710730	Introduction of relaxed monitoring in NB-IoT in 36.306 14.4.0 B NB_IOTenh-Core	Ericsson		draftCR	Rel-14
R2-1710731	Introduction of relaxed monitoring in NB-IoT in 36.331 14.4.0 B NB_IOTenh-Core	Ericsson		draftCR	Rel-14

### 9.13.4 Semi-Persistent Scheduling

*Including output from email discussion [99#42][NB-IoT] SPS options (Huawei)*

R2-1711329	Summary of email discussion [99#42][NB-IoT] on SPS options NB_IOTenh2-Core	Huawei report	Rel-15
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A) Proposal: SPS for M2M long-time regular transmissions allowing UE to be in Idle/PSM mode (at least between the transmissions), either for stationary UEs, or with R1 solutions for Timing advance. This kind of SPS can remove the need for MSG1 and MSG2 in the Access <sup>[2]. [3]</sup>.

B) Proposal: Support NB-IoT SPS for DL transmission of large files in Connected mode, e.g. for firmware updates. This kind of SPS can reduce PDCCH overhead, when a file is transmitted in multiple TBs <sup>[4]. [5]</sup>.

C) Proposal: Consider UL SPS support with skipUplink for NB-IoT, to be used as a “scheduling request” + BSR channel <sup>[4]. [5]</sup>.

D) Proposal: SPS for media type applications or similar (in connected mode), where the SPS resource is used during limited time. This kind of SPS can reduce PDCCH overhead and SR overhead (e.g. by RACH) <sup>[6]</sup>.

E) Proposal: SPS for SC-PTM in IDLE mode, to reduce PDCCH load for SC-MTCH, and SC-MCCH <sup>[5]</sup>.

#### DISCUSSION

##### Solution C

- Huawei cannot agree to this and think we should wait for R1 to understand whether they will do an phy SR channel. Huawei think that either Phy Scheduling request of SPS al'la option C is needed.
- QC has concerns on “skip uplink” as eNB will not know whether the UE is there or not.
- LG think that if this is a shared resource then think it can be useful.
- Ericsson support solution C
- QC wonders still why “skip uplink” is needed. LG think that skip uplink is useful to save power, to avoid non-useful transmissions.
- QC wonders if such solution could not just be a general solution, applicable also to Data in the UL. Chair think the solution could indeed be general, but we need a target use case to make sure it works for this case.

⇒ **From R2 perspective it seems feasible to design SPS as an alternative to PUCCH for D-SR (+BSR) in connected mode. However there may be performance differences between SPS and Physical Layer solution, e.g. overhead, which will not be evaluated in R2.**

⇒ **R2 leave it to R1 to decide what to do, e.g. whether to develop a physical channel for D-SR, or request R2 to develop a SPS solution for D-SR (+BSR).**

##### Solution A

- LG support this. Ericsson think this is too complex, especially in the network end because we need to reserve resources in the network for long times. QC think that according to SLAs the UEs need to be served for many years, and this time frame should not be a problem. ZTE think EDT can be used instead, and need a lot of discussion. Intel also think there are issues that need discussion, e.g, how that UE can send data in Idle Mode. LG think that for stationary UEs the time alignment is not a problem and the solution can be quite simple.

Veolia support this, and think that if this is a very stable periodicity etc, this should help in resource mgmt, and EDT and SPS should be used together. Mediatek agrees with Veolia, but ack that there are more discussions are needed. Huawei think that TA is not just related to mobility and that EDT can be used instead. Nokia also has concerns related to TA, and think that TA could change due to change in environment. Ericsson think that MAC need to be active in Idle mode, which is a big change. MTK think this isn't impossible. Gemalto think this can be beneficial but requires time. QC also support this solution.

⇒ **There is significant interest and significant resistance.**

Solution B (unicast DL)

- QC think that SPS for multicast is better. Intel agrees. LG think that E is better. Huawei think that SPS is maybe not needed at all. Ericsson support this use case, and there are cases also when the network doesn't support multicast.
- QC think this should not be supported, the UE anyway will monitor PDCCH in connected, which means that there is no power consumption gain. Ericsson think that there is power saving for this case.

⇒ **Some support.**

Solution D

- LG think this can be supported.

⇒ **We don't develop specific solution to cover this specific use case.**

Solution E (SC-PTM SPS)

- ZTE think this is not needed, and that it will reduce the scheduling flexibility. ZTE don't support SPS at all.
- Veolia think this is useful. There is indeed an issue with power consumption for firmware update. Veolia are not sure SC-PTM is the solution, but looking for enhancements for firmware update. Current issues essentially prevent firmware update. QC supports this.

⇒ **We support SPS for SC-PTM (note that there would be differences to legacy unicast SPS)**

R2-1711330	Scheduling request in connected mode	Huawei, HiSilicon, Neul discussion	Rel-15
	NB_IOTenh2-Core		
R2-1711631	M2M SPS	MediaTek Beijing Inc. discussion	
R2-1711572	Further consideration on SPS for NB-IoT	LG Electronics Inc. discussion	Rel-15
	NB_IOTenh2-Core		
R2-1711656	Configuring and activating SPS for NB-IoT	Ericsson discussion	Rel-15 NB_IOTenh2-Core
R2-1710908	Further consideration on SPS in FeNB-IoT	ZTE Wistron Telecom AB discussion	Rel-15 NB_IOTenh2-Core

*Above 5 docs not treated*

### 9.13.5 RRC Connection Release Enhancements

*Including output from email discussion [99#43][NB-IoT] RRC Connection release (Mediatek)*

R2-1710795 Report of Email Discussion [99#43][NB-IoT] RRC Connection Release MediaTek Inc. report

- Proposal 1: RAN2 to discuss whether to support RRC release via lower-layer signalling (MAC CE, PDCCH DCI)
- Proposal 2: If RRC release is not signalled via RRC message but there is any legacy information to be delivered, the *RRCConnectionRelease* message can be used.
- Proposal 3: For UP solution, study whether and how the resume ID can be transmitted earlier.
- Proposal 4: UE can be released immediately upon receiving RRC release signalling, which can be either RRC message without Poll bit, or a DCI indication.

- Proposal 5: RRC release signalling is considered to be transmitted in RLC-AM.  
? Proposal 6: Timer-based release at UE side is not supported Or Introduce *DataInactivityTimer* without NAS recovery
7. Introduce UL HARQ-ACK feedback
  8. In Rel-15 NB-IoT, for reliable use of *DataInactivityTimer*, the UE starts/restarts the *DataInactivityTimer* when the UE sends the MAC SDU including BSR=0 or RLC STATUS report for DTCH logical channel or DCCH logical channel.
  9. To trigger BSR when the buffer size becomes zero.

#### DISCUSSION

Proposal 1: explicit methods to trigger RRC connection release (DCI, MAC CE, RRC Release msg).

- Huawei think the MAC CE should not be considered as DCI is anyway more efficient
- Ericsson don't understand why we don't have contributions on this.
- QC think that the main gain of DCI vs RRC release is that PDSCH transmission is not needed, QC think that an Ack can be scheduled in the UL (by the same DCI) if such Ack is needed.
- Ericsson wonders if the eNB will retransmit if there is no ack.
- LG think that the L3 is more reliable and that we don't need a new DCI. Huawei wonders why L3 is more reliable if we don't have RLC ack. MTK think that the reliability of DCI with Ack and eNB retransmissions is the same as PDSCH (without RLC ack). ZTE agrees with MTK, and think that timer based release is even better from overhead point of view.
- Intel think there is some complexity with this, e.g. spec of DCI, moving RRC release info to another message. QC think the complexity is relative to the gain. Ericsson think there need to be a new PDCCH format. QC clarifies that there are spare bits in the DCI. Ericsson think these changes are radical.
- LG think there is MAC impact to specify that HARQ will now be dependent on the DCI contents and that we will have ACK without PDSCH.

Proposal 2: If RRC release is not triggered via RRC message but there is any legacy information to be delivered, the *RRCConnectionRelease* message can be used.

Proposal 3: For UP solution, study whether and how the resume ID can be transmitted earlier.

- Mediatek clarifies that the intention of P2 is that if the RRC release message contents is needed the network uses the RRC release message to trigger the RRC release.
- Huawei think that redirection and connection reject should be in the RRC connection release message.
- Nokia agrees that in any case the eNB will be allowed to use the RRC connection release message. ZTE think that if eNB configures the timer based RRC connection release the RRC Connection release message is not used, and suspend cannot be done unless we send the suspend indication beforehand.
- Nokia think that the resume ID can be transmitted in the connection setup phase. LG agrees with Nokia.
- Ericsson think there could be security concerns on resume ID provided earlier. QC think there are no security concerns. Ericsson point out that there can be concerns that the UE re-establishes with the resume ID. Chair point out that this is about release/suspend and following resume, not about RLF.
- Intel is wondering if the resume ID would then be sent un-ciphered, in MSG4.
- Huawei think that we are mixing early data transmission and RRC release.

Proposal 4: UE can be released immediately upon receiving RRC release signalling, which can be either RRC message without Poll bit, or a DCI indication.

- Ericsson wonders what should be the behaviour, do the UE send the HARQ ACK? Do the UE further wait? LG think that the UE don't even need to send the HARQ ACK as we can have the Data Inactivity timer resolving any inconsistency problem. MTK agrees that the timer resolves problems but think that the UE should anyway send the HARQ ACK. Ericsson think the UE should send the HARQ Ack.
- ZTE think that timer based is still better, and think there may be impact on RLC.
- Veolia strongly supports this proposal, and the DCI proposal and think that this can be even for Rel-14. Huawei also support this proposal.



Proposal 6: Timer-based release at UE side is not supported Or Introduce *DataInactivityTimer* without NAS recovery

- QC think there is no advantage of this.
- Ericsson think there are benefits to using the timer, as sometimes it could even be avoided to send the RRC release to the UE. Huawei think that for the CP solution we are dependent on the MME to release the connection.
- Intel think that without the NAS recovery there will be state mismatch. LG cannot see why we need the NAS recovery. The state mismatch is anyway resolved by the timer.
- Ericsson think the data inactivity timer doesn't need to be 10s.

7. Introduce UL HARQ-ACK feedback

- Huawei think this is not acceptable. Intel support to introduce this.
- Chair think this is not a RAN2 feature and the impact is potentially large.

8.

- Chair wonders if this doesn't already happen today as BSR=0 is always a padding BSR and is thus always sent with the last data.
- this and related proposals can be discussed if / when we agree to support data inactivity timer without NAS recovery.

⇒ We don't consider RRC release by MAC CE.

⇒ If is FFS if RRC release can be triggered by PDCCH DCI

⇒ RRC connection release message can be used by the eNB.

⇒ FFS if RRC Resume ID can be transmitted to the UE in the RRC connection establishment / resume procedure (or reconfiguration procedure).

⇒ UE can go to Idle Mode upon receiving the signalling that triggers RRC release, without RLC-AM Ack and without 10s wait time. FFS if the UE is required to send HARQ Ack or not.

⇒ RRC release message without RLC-AM Ack can be done by RLC-AM without Poll.

⇒ It is FFS if we Introduce *DataInactivityTimer* without NAS recovery

⇒ Chair think that R2 cannot specify UL HARQ-Ack Feedback for NB-IoT without a WID and work in R1.

R2-1710735 Quick RRC connection release Ericsson discussion Rel-15 NB\_IOTenh2-Core  
R2-1708279

⇒ noted

R2-1710911 Further consideration on quick release of RRC connection in FeNB-IoT ZTE Wistron Telecom  
AB discussion Rel-15 NB\_IOTenh2-Core

⇒ noted

R2-1711331 RRC Connection Release Enhancement Huawei, HiSilicon, Neul discussion Rel-15  
NB\_IOTenh2-Core

⇒ noted

R2-1711346 Quick release of RRC connection for NB-IoT LG Electronics Inc. discussion Rel-  
15 36.321 NB\_IOTenh2-Core

⇒ noted

R2-1711356 Reliable use of *DataInactivityTimer* LG Electronics Inc. discussion Rel-15  
36.321 NB\_IOTenh2-Core R2-1709166

⇒ noted

R2-1711454 Potential specification impact of RRC connection release via DCI Qualcomm Incorporated  
discussion Rel-15

⇒ **noted**

**Draft CRs**

R2-1711351	Change of release cause in case of DataInactivityTimer expiry	LG Electronics Inc.
	draftCR Rel-15 36.331 14.4.0 C NB_IOTenh2-Core	
R2-1710736	Introduction of DataInactivityTimer without NAS recovery in 36.306	Ericsson draftCR Rel-15 36.306 14.4.0 B NB_IOTenh2-Core
R2-1710737	Introduction of DataInactivityTimer without NAS recovery in 36.321	Ericsson draftCR Rel-15 36.321 14.4.0 B NB_IOTenh2-Core
R2-1710738	Introduction of DataInactivityTimer without NAS recovery in 36.331	Ericsson draftCR Rel-15 36.331 14.4.0 B NB_IOTenh2-Core
R2-1710739	Introduction of uplink HARQ-ACK feedback in NB-IoT in 36.306	Ericsson draftCR Rel-15 36.306 14.4.0 B NB_IOTenh2-Core
R2-1710740	Introduction of uplink HARQ-ACK feedback in NB-IoT in 36.321	Ericsson draftCR Rel-15 36.321 14.4.0 B NB_IOTenh2-Core
R2-1710741	Introduction of uplink HARQ-ACK feedback in NB-IoT in 36.331	Ericsson draftCR Rel-15 36.331 14.4.0 B NB_IOTenh2-Core

*Above 7 tdocs not treated*

*Withdrawn*

R2-1711355	Reliable use of DataInactivityTimer	LG Electronics Inc.	discussion	Rel-15
	36.321 NB_IOTenh2-Core	R2-1709166	Withdrawn	

**9.13.6 UE differentiation**

*Including output from email discussion [99#44][NB-IoT] UE differentiation (Huawei)*

R2-1711327	Report of email discussion [99#44][NB-IoT] on UE differentiation	Huawei report	Rel-15
	NB_IOTenh2-Core		

**DISCUSSION**

Proposal 1: Periodic communication parameters (Periodic communication indicator, Scheduled communication time, Periodic time) can be useful at the eNB, e.g. for SPS configuration, provided the parameters are reliable and defined with a fine granularity.

- This seems to be related to SPS. Nokia think that periodicity can also be used for RRC release. Ericsson think we need to discuss what periodic means in detail, if it is average or not. Nokia agrees.
- Chair suggest that we exclude the SPS related items.
- QC wonders how this is related to RRC release. Nokia think that if the periodicity is short, the UE would be kept in connected with suitable C-DRX.
- Ericsson think that this information is not useful as there is the RAI. Nokia think that periodicity is in general useful for many purposes. Veolia think that in combination with other information also the periodic indication could be useful.

⇒ **Include this as useful parameter(s) in the LS**

Proposal 3: Knowledge of the traffic profile (e.g. single packet transaction, UL only, UL followed by DL, Typical Packet size ...) would be useful for scheduling, early data transmission, or quick RRC connection release, provided that the related parameters are specified.

⇒ **Include this as useful parameter(s) in the LS**

Proposal 2: The 'Stationary' information can be useful, both in combination with the periodic communication parameters or on its own, on the condition the parameter indicates a permanent geo-stationary position.

- Ericsson wonders what this is. Huawei think the intention is that this is a fixed UE that really doesn't move in geographical sense. LG agrees, and agrees this information can be useful. Gemalto think that the UE can still be moved between cells, but think that this is useful.
- Nokia wonders how this can be used. Would the eNB be required to use this. Huawei want to use this to do less repetitions. Sierra Wireless think the meaning is clear and that it can indeed be useful, e.g. for paging.
- Nokia don't think this is useful but would be ok to indicate this anyway. Ericsson agrees and think this can be observed in the eNB.

⇒ **Include this as useful parameter(s) in the LS**

Proposal 6: RAN2 to discuss the usefulness of the knowledge of the PSM/eDRX configuration in connected mode

- Ericsson think this is not needed. Huawei think this could be useful to adapt the Release timer. Ericsson think that the control should be in the MME, i.e. the MME should release the S1 connection immediately if the strategy is that the UE is kept reachable in Idle mode.

⇒ **Not Include this as useful parameter in the LS**

Proposal 7: knowing whether the device is battery powered can be useful.

- Nokia wonders how this is useful? Ericsson think that this might be useful.
- Gemalto wonders what it means.
- Chair think that some additional information is needed to understand whether the UE is battery sensitive or not,

⇒ **Include this as useful parameter(s) in the LS**

Proposal 8: RAN2 to discuss the usefulness of additional information related to the power profile, e.g. <battery life time>, power consumption over 24 hours, <battery status>.

- Intel think that P7 is enough, maybe information on whether the battery is rechargeable or not. MTK support this as battery can be different capacity etc.
- Veolia think that battery life expectation could be useful
- LG think that remaining battery time is more useful than just battery powered info.

⇒ **No consensus now, FFS if detailed battery/power information could be useful.**

Proposal 4: RAN2 to discuss whether the source of the parameters should be discussed in RAN2 or in SA2.

- Huawei think that R3/SA2 should decide how to derive this information.
- Ericsson think that reliability of the information is important, and think that the eNB could be the best source of information. Ericsson think that subscription can give much of this information. Huawei agrees, at least for some parts of the information. Nokia also think that this information is useful and that eNB can observe some of this, and that it is important that the information has the right granularity, and that UE should provide this information to the eNB.
- LG agree to send an LS to RAN3 and SA2, and think that the information is useful.
- Veolia think this is very useful and are open to which entity provides info. Veolia think additionally that authorization info need to be provided from MME to eNB.
- Sierra Wireless think that if the UE is to report this there would be a requirement to report this from application to modem/middleware software, and think that also subscription based information can be problematic, and if the UE reports this the information would anyway be fresh and applicable to the current usage of the UE.,
- Gemalto think that the information can come from both subscription and from the UE.

⇒ **Send an LS to SA2 and R3**

Offline (210), Draft LS on UE differentiation to SA2, R3 and CT1 (Huawei) in R2-1711891

- Inform on what information RAN2 considers useful for AS configuration and how it is expected to be used, and e.g. indicate required granularity, indicate that reliability is important.
- Inform on discussion on the potential sources of this information, Assume that in all cases the information is stored in MME, original source could be UE, eNB, subscription info.
- Ask whether they have opinion on the source of the information, and whether they have considered other parameters.

R2-1711891 Draft LS on UE differentiation to SA2, R3 and CT1 Huawei

- For Battery powered, add "not rechargeable nor replaceable".
- Remove FFS
- Remove yellow part

⇒ **With these changes the LS is approved, final version in R2-1711895**

R2-1710751 Further input to UE differentiation in NB-IoT Ericsson discussion Rel-15  
NB\_IOTenh2-Core R2-1708287

R2-1711636 Further discussion on NB-IOT UE differentiation MediaTek Inc. discussion

R2-1711485 Data characteristics for UE differentiation Nokia, Nokia Shanghai Bell discussion Rel-15  
NB\_IOTenh2-Core

R2-1711328 [DRAFT] LS on UE differentiation for Rel-15 NB-IoT Huawei [to be RAN2] LS out Rel-15  
NB\_IOTenh2-Core

*Above 4 tdocs not treated*

### 9.13.7 Small Cell Support

R2-1711333 Small cell support in NB-IoT Huawei, HiSilicon, Neul discussion Rel-15 NB\_IOTenh2-Core

R2-1710957 Consideration on supporting small cell in FeNB-IoT ZTE Wistron Telecom AB  
discussion Rel-15 NB\_IOTenh2-Core

R2-1711262 2-Step RACH support for Small Cells. Gemalto N.V. discussion

*Above 3 tdocs not treated*

### 9.13.8 TDD

R2-1710485 Study of Impacts on Timers due to TDD support Ericsson discussion Rel-15

R2-1711332 TDD support in NB-IoT Huawei, HiSilicon, Neul discussion Rel-15 NB\_IOTenh2-Core

R2-1710486 Study of Paging, SI Acquisition and SIB Scheduling impacts due to TDD Ericsson  
discussion Rel-15

R2-1710487 Study of TDD NPRACH and RA-RNTI impacts due to TDD Ericsson discussion Rel-15

R2-1710978 Consideration on TDD support in FeNB-IoT ZTE Wistron Telecom AB discussion  
Rel-15 NB\_IOTenh2-Core

*Above 5 tdocs not treated*

✉ **[99bis#34][NB-IoT] Timer impact of TDD (Ericsson)**

Intended outcome: Report to next meeting

Deadline: Thursday 2017-11-09

### 9.13.9 Other

*E.g. Support for RLC-UM, Wake-Up Signal, Support for physical layer SR, Measurement Accuracy Enhancements, NPRACH reliability, NPRACH range, other*

### Wake-Up Signal (joint 9.13 and 9.14)

R2-1710749 Wake-up signal for NB-IoT & eMTC Ericsson discussion Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core R2-1708284

*Moved here from 9.14*

Breif discussion on P2 and P12

- Ericsson think that P12 may only work for stationary UEs. Intel think that P12 is an optimization and that we can discuss mobility and paging group.
- Ericsson also think that WUS is not used for RRM measurements. Huawei agrees.

⇒ **noted**

R2-1710641 WUS consideration for eMTC Intel Corporation discussion Rel-15 LTE\_eMTC4-Core

*Moved here from 9.14*

Breif discussion on P2

- LG think there is only R1 impact.
- Ericsson think that UE need to use PSS/SSS as the UE need to know that it is still camped on the specific cell. For NB-IoT it seems R1 assumes to keep NPSS/NSSS ..
- Intel think that if PSS/SSS are needed, there will be no gain. QC think that this is not clear yet whether the WUS signal may carry synch information.

⇒ **noted**

R2-1711326 Power saving signal or channel in NB-IoT and eMTC Huawei, HiSilicon, Neul discussion Rel-15 NB\_IOTenh2-Core

R2-1710980 Consideration on wake-up signaling in FeNB-IoT ZTE Wistron Telecom AB discussion Rel-15 NB\_IOTenh2-Core

*Above 2 docs not treated*

### Measurement Accuracy Enhancements

R2-1710744 Measurement accuracy improvements Ericsson discussion Rel-15 NB\_IOTenh2-Core R2-1708280

R2-1710745 Introduction of measurement accuracy improvements in 36.306 Ericsson draftCR Rel-15 36.306 14.4.0 B NB\_IOTenh2-Core

R2-1710746 Introduction of measurement accuracy improvements in 36.331 Ericsson draftCR Rel-15 36.331 14.4.0 B NB\_IOTenh2-Core

### RLC-UM

R2-1710750 RLC UM for NB-IoT for SRBs Ericsson discussion Rel-15 NB\_IOTenh2-Core R2-1708283

### Scheduling Request

R2-1711657 NB-IoT PHY Scheduling Request Ericsson discussion Rel-15 NB\_IOTenh2-Core

R2-1710981 Consideration on SR and PHR transmission enhancement in FeNB-IoT ZTE Wistron Telecom AB discussion Rel-15 NB\_IOTenh2-Core

### NPRACH enhancements

R2-1711658 NPRACH reliability and range enhancement for NB-IoT Ericsson discussion Rel-15 NB\_IOTenh2-Core

## CE Level Access Barring

R2-1711638 Access barring for CE level in NB-IOT LG Electronics UK discussion NB\_IOTenh2-Core R2-1709312

## Other Enhancements

R2-1711343 Stopping contention resolution timer based on retransmission scheduling LG Electronics Inc. discussion Rel-15 36.321 NB\_IOTenh2-Core R2-1709172

R2-1711344 Stopping contention resolution timer based on retransmission scheduling LG Electronics Inc. CR Rel-15 36.321 14.4.0 1158 - F LTE\_eMTC4-Core, NB\_IOTenh2-Core R2-1709139

R2-1711401 Enhanced RRC Connection Re-establishment in NB-IoT LG Electronics Inc. discussion Rel-15 NB\_IOTenh2-Core R2-1709456

R2-1710984 Consideration on UE power consumption reduction in FeNB-IoT ZTE Wistron Telecom AB discussion Rel-15 NB\_IOTenh2-Core

## Running CRs

R2-1710742 Introduction of further NB-IoT enhancements in 36.306 Ericsson CR Rel-15 36.306 14.4.0 1513 - B NB\_IOTenh2-Core

R2-1710743 Introduction of further NB-IoT enhancements in 36.322 Ericsson CR Rel-15 36.322 14.1.0 0131 - B NB\_IOTenh2-Core

### Withdrawn

R2-1711161 Access barring for CE level in NB-IOT LG Electronics Inc. discussion Rel-15 NB\_IOTenh2-Core R2-1709312 Withdrawn

## 9.14 Even further enhanced MTC for LTE

(LTE\_eMTC4-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-171427)

Time budget: 2 TU

*Documents in this agenda item will be handled in a break out session*

### 9.14.1 Organisational

*Including incoming LSs, rapporteur inputs, running CRs*

R2-1710019 LS on UL HARQ-ACK feedback for Rel-15 LTE eMTC (R1-1715299; contact: ZTE) RAN1  
LS in Rel-15 LTE\_eMTC4 To:RAN2  
=> Noted

R2-1710044 LS on new UE power class for Rel-15 eMTC (R4-1708835; contact: Ericsson) RAN4 LS in  
Rel-15 LTE\_eMTC4 To:RAN2 Cc:RAN1  
=> Noted

### 9.14.2 Early data transmission

*Early Data transmission for NB-IoT and MTC is treated jointly under this AI.*

*Note that documents in agenda item 9.13.1 are merged with the documents in this agenda item.*

*Including output from email discussion [99#45][NB-IoT/MTC] Early data transmission (Qualcomm)*

R2-1710888 Email discussion report: [99#45][NB-IoT/MTC] Early data transmission Qualcomm  
Incorporated discussion Rel-15 LTE\_eMTC4-Core, NB\_IoTenh2-Core

- Huawei wonders what companies have in mind regarding the motivation for this feature. MediaTek thinks it would be more beneficial to check the number of messages rather than state transition to start with regarding power consumption reduction.

**Proposal 1. PRACH partitioning is used to indicate the UE's intention to use early data transmission in Msg3. Backward compatibility shall be preserved. FFS details on the PRACH pool, e.g., preamble/time/frequency/carrier domain of PRACH partitioning.**

- ZTE prefers to have PRACH partitioning similar to the mechanism we introduced in Rel-13. QC thinks PRACH partitioning is one option we have. Intel thinks we can also consider using Group B. Ericsson agrees with PRACH partitioning, but has concerns with a partitioning mechanism same as the one introduced in Rel-13. Ericsson propose to configure some preambles that can be used by both legacy and Rel-15 UEs.

**Proposal 2. The EDT procedure is to be used only when complete UL data can fit in the grant given in the RAR.**

- Huawei thinks it would only be beneficial if the UE is released immediately. MediaTek wonders if that would mean further partitioning for TBS in the UL. Ericsson wonders what EDT procedure means in this context. QC explains that if the data in UL exceeds the grant the UE can continue with the legacy procedure.

- ZTE thinks grant sizes may not need to be a fixed value. Kyocera wonders if the size of the TBS can be broadcast.

**Proposal 3. One payload size for this release with possibility to extend to multiple payload sizes in the future. The payload size may be different for eMTC and NB-IoT.**

- MediaTek thinks this may not be realistic. If the coverage is bad, it is either a large padding and thus repetitions as opposed to the case where TBS is small so that it is hard to fit the UL data in most cases. QC thinks for DL EDT there is no need for a larger grant for Msg3. Veolia thinks it can be good to accommodate different TB sizes.

- Veolia wonders how the NW inform UEs whether EDT transmission is allowed. The question is whether there should be a mechanism in the CN to authorize UEs to use EDT. MediaTek thinks this is important since it is good to have a mechanism to avoid congestion regarding PRACH resources.

- Nokia thinks it is good to indicate TBS. One option is further partitioning. MediaTek also agree that one option is further partitioning. Ericsson thinks one payload size is not realistic. ZTE agrees with the further partitioning approach. ZTE prefers to segment the data if there is only one TB size for EDT. Sierra Wireless thinks providing grant with flexible sizes would be beneficial. Huawei mentions that TBS can be allocated based on the CE level. This is already possible since the eNB knows the CE level based on the preamble. QC thinks broadcast the max possible size for grant would be beneficial for the NW. MediaTek considers two proposals: to indicate the size by PRACH partitioning, eNB allows some sort of flexibility in the grant. Nokia thinks UE can indicate payload via partitioning. Veolia thinks it would be good to have predictability for UL grants.

**Proposal 4. The maximum TBS for Msg3 should be decided by RAN1. Send LS to RAN1.**

- LG thinks guidance from RAN2 would be good. Huawei prefers to ask RAN1 what is possible as the maximum TBS size. Nokia prefers to send the LS to RAN1. MediaTek and QC think there may not be a need to send the LS to RAN1.

- We will send an LS to RAN1 with the agreements we have from this meeting and indicate that we assume that the legacy TBS table is used for EDT.

**Proposal 5. UE does not transit to full RRC connected state during early data transmission session unless eNB specifically triggers the UE to establish full RRC connection.**

- LG thinks UE may prefer the legacy mechanism in some cases. MediaTek thinks it would be good to look at the CP solution first. MediaTek thinks we should stick to the existing message and procedures as much as possible. Ericsson agrees and wonders whether the UE moves to the connected mode and back to idle if it is released to idle. QC thinks the state UE is in is not clear, e.g. UE does not have a C-RNTI. MedisTek thinks the state transition is specified in the spec and there does not seem to be a condition C-RNTI. Ericsson suggests not to discuss based on the state, but rather the UE behaviour. MediaTek thinks it should be possible for the UE to go to idle mode after Msg4. Gemalto thinks eNB does not know whether there is data in the DL so that the UE does not need to be paged shortly after. Ericsson thinks the baseline should be that it is up to the eNB to decide whether the UE goes to idle. MediaTek thinks there are other aspects that need to be considered such as UE to go to connected mode from network standpoint for NAS procedures etc.

**Proposal 6. FFS whether new RRC messages are defined or existing RRC messages are extended to provide signalling for EDT.**

- This proposal is discussed with the other related proposals below.

**Proposal 7. Check with RAN3/SA2/CT1 whether/which of the following info which is included in Msg5 in legacy procedure should be included in Msg3 for EDT: selectedPLMN-Identity, registeredMME, gummei-Type, s-TMSI, attachWithoutPDN-Connectivity, up-CIoT-EPS-Optimisation, cp-CIoT-EPS-Optimisation, dcn-ID.**

- Huawei thinks none of those parameters are needed to be transmitted in Msg3. MediaTek thinks most probably this is the case, but it would be good to ask with an LS. Intel thinks it will be used for service request.

**Proposal 8. RAN2 does not intend to change Msg2 format unless asked by RAN1. Send LS to RAN1.**

- Ericsson thinks this is up to RAN2 so no need to send an LS to RAN1.

**Proposal 9. Maximum grant size should be same as one of the already supported TBS(s) for the relevant mode (eMTC or NB-IoT).**

- No need to capture anything based on this proposal.

**Proposal 10. No new procedure is defined for the differentiation of UL grant for early data vs legacy procedure. Use of the grant by EDT-enabled UE is left upto implementation.**

- No need to capture anything based on this proposal.



**Proposal 11. For CP solution, append the NAS PDU in the same RRC message sent in Msg3 and transmit as CCCH SDU. FFS for UP solution.**

**- For CP solution:**

- Ericsson thinks that another would be to multiplex in MAC. Huawei thinks that Msg3 retransmission can be a problem, so it would be good to know how retransmission would work before making any decisions. LG has a similar thinking with Ericsson and one needs to consider how messages are prepared.
- QC thinks there is no need for RLC AM for Msg3.
- Nokia supports this proposal for the CP solution. MediaTek, Huawei, Veolia, QC, and ZTE agree. Retransmission for Msg3 needs further discussion.
- LG would like to multiplex the data and RRC message part in MAC.
- Ericsson wonders what if the grant size is smaller than the data. How would the modelling work? The message needs to be discarded.

**- For UP solution:**

- Ericsson would like to have multiplexing in MAC. LG prefers DTCH for data transmission. MediaTek thinks we can assume the RBs can be resumed before transmitting Msg3 in similar way to legacy.
- Ericsson thinks SRB1 can be used. Intel thinks we should consider DTCH (UP data) + CCCH (RRCConnectionResumeReq) and DCCH (NAS PDU via pinned connection) + CCCH(RRCConnectionResumeReq).

=> We will come back to this particular case, i.e. pinned connection, later.

- For the RRC message part: MediaTek prefers to use SRB0. Ericsson thinks SRB1 would be more beneficial.

=> For UP solution SRB0 is used to transmit the RRC message in Msg3. We assume that there are no security related concerns.

- QC thinks we need to consider the scenario where data is not ciphered. In this case data will be visible to the fake eNB. This may be a security concern.

- MediaTek explains that the data will be sent by the time that UE recognizes that it is a fake eNB.

**Proposal 12. Discuss how to handle retransmission in case of Msg3 transmission failure.**

**- For CP&UP solutions:**

- Companies raised concerns since there is no RLC retransmission in this case. This has an impact on the reliability of the message.
- We do not know how HARQ retransmissions are done if we have multiple UL grants.

=> We will come back to this discussion once we have a better view regarding how UL grants in Msg2 work.

**Proposal 13. For CP, the DL data can be optionally included as NAS PDU in Msg4. For UP, DL data can be optionally MAC-multiplexed with RRC message and Contention Resolution ID in Msg4.**

**- For CP solution:**

- Huawei supports the proposal. Ericsson wonders what happens if data in the DL is late. QC thinks it will not be EDT in DL anymore. The eNB does not send the UE to idle mode. Intel thinks it is not possible to mux these messages in SRB0.
- MediaTek, Veolia, and QC support the proposal.

**- For UP solution:**

- Huawei and LG support the proposal.

**Proposal 14. Msg4 can serve as success/failure confirmation of EDT in Msg3.**

- This proposal was discussed, but we decided not to capture anything with respect to success /failure. Success/failure of data transmission will be discussed along with retransmission of messages.

**Proposal 15. Msg4 can indicate whether the UE should transit to full RRC connection.**

- We have already captured an agreement related to this proposal.

**Proposal 16. Successful EDT procedure in Msg3 and/or Msg4 ends with Msg4, i.e., there is no need of Msg5.**

**Proposal 17. No change in legacy Msg5 is anticipated for fallback from EDT.**

**Proposal 18. NAS security is used for UL data in CP case pending confirmation from SA3 that it is sufficient.**

**Proposal 19. For EDT in UP case, NCC is provided at the time of suspension pending confirmation from SA3 that it is ok.**

**Proposal 20. NAS security is used for DL data in CP case pending confirmation from SA3 that it is sufficient.**

- We will send an LS to SA3 based on the proposals above.

**Proposal 21. RAN2 understands S-TMSI for CP, and resumeID and shortResumeMAC-I for UP modes are sufficient to identify UE at the MME and eNB respectively. Confirm with RAN3, SA2, SA3, CT1.**

#### **Agreements**

- PRACH partitioning is used to indicate UE's intention to use early data transmission in Msg3. Backward compatibility shall be preserved. FFS: details on the PRACH pool, e.g., preamble/time/frequency/carrier domain of PRACH partitioning.
- For CP during the UL EDT procedure, if the UE receives a grant in which data does not fit, the

- UE does not send the data in Msg3. For UP solution it is FFS if the EDT grant can be used for UL data if the grant is smaller than the UL data size.
- It is FFS if there is a need to introduce an authorization mechanism.
- Maximum possible grant size for Msg3 is broadcast per CE. It is FFS if the UE indicates the grant size it needs for Msg3 via PRACH partitioning.
- Send an LS to RAN1 with the agreements we have from this meeting and indicate that we assume that the legacy TBS table for PUSCH transmission is used for EDT.
- Msg4 decides whether the UE goes to RRC connected mode or RRC idle mode. The content of Msg4 for EDT is FFS.
- The intention to use EDT is for data, i.e. not for NAS signalling.
- Send an LS to RAN3/SA2/CT1 whether any of the following parameters which are included in Msg5 in legacy procedure should be included in Msg3 for EDT: selectedPLMN-Identity, registeredMME, gummei-Type, attachWithoutPDN-Connectivity, up-CIoT-EPS-Optimisation, cp-CIoT-EPS-Optimisation, dcn-ID.
- RAN2 assumes that S-TMSI for CP, and resumeID and shortResumeMAC-I for UP solutions are sufficient to identify UE at the MME and eNB respectively. We will provide this assumption in an LS to RAN3, SA2, SA3, CT1.
- For CP solution, NAS PDU for data is encapsulated in the RRC message sent in Msg3 and transmitted as CCCH SDU.
- For UP solution SRB0 is used to transmit the RRC message in Msg3.
- For UP solution, CCCH (RRC message) and DTCH (UP data) are multiplexed in MAC in Msg3.
- For UP, AS security is resumed before transmitting Msg3, and data transmitted in Msg3 is protected by AS security.
- For CP solution, NAS PDU data in the DL can be optionally encapsulated in the RRC message sent in Msg4 and transmitted as CCCH SDU.
- For UP solution, DL data can be optionally multiplexed in MAC, i.e. DCCH (RRC message(s)) and DTCH (UP data) in Msg4.
- FFS: For UP solution: case for pinned connection, i.e. CCCH (RRCConnectionResumeReq) + DCCH (NAS PDU via pinned connection)

☞ Comeback [#401]: Draft LS to RAN1 on the possible TB sizes for PUSCH transmission for EDT and whether new UL grant format in RAR is needed [Qualcomm]

R2-1711973 [Draft] LS on Early Data Transmission Qualcomm Incorporated LS out Rel-15 LTE\_eMTC4-Core, NB\_IOTenh2-Core

=> Remove “Furthermore, to indicate the different-sized grant to the UE, RAN2 does not intend to change Msg2 format unless asked by RAN1.”

=> Add that RAN2 is currently working on the following FFS: “FFS: details on the PRACH pool, e.g., preamble/time/frequency/carrier domain of PRACH partitioning.”

=> Replace “To enable UL early data transmission in Msg3 for a UE in RRC\_IDLE..” with “To support UL early data transmission in Msg3 during a RACH procedure initiated by a UE in RRC\_IDLE ...”

=> Remove “legacy” in front of Rel-13

=> Replace “of new UL grant format(s)” with “for new UL grant format(s)”

=> Update the following action:

**ACTION:** RAN2 kindly asks RAN1 to take above agreements into consideration and respond to the questions above.

☞ Comeback with a revision based on the agreements above with the Tdoc number R2-1711975.

R2-1711975 [Draft] LS on Early Data Transmission Qualcomm IncorporatedLS out Rel-15 LTE\_eMTC4-  
Core, NB\_IOTenh2-Core

=> The LS is approved in R2-1711977.



Comeback [#402]: Draft LS to RAN3/SA2/CT1/SA3

- To RAN3/SA2/CT1 on whether any of the following parameters which are included in Msg5 in legacy procedure should be included in Msg3 for EDT: *selectedPLMN-Identity*, *registeredMME*, *gummei-Type*, *attachWithoutPDN-Connectivity*, *up-CIoT-EPS-Optimisation*, *cp-CIoT-EPS-Optimisation*, *dcn-ID*, *ce-ModeB*

- To SA3: on security issues with respect to EDT for CP and UP solutions. The intention is to ask SA3 whether it is sufficient that NAS security is used for UL and DL data in CP solution, and whether it is OK to provide NCC during the previous connection.

- The intention is to explain how it works in the LS and leave it up to SA3 to confirm whether the null-ciphering issue above needs to be addressed or not.

R2-1711974 [Draft] LS on Early Data Transmission Qualcomm IncorporatedLS out Rel-15 LTE\_eMTC4-  
Core, NB\_IOTenh2-Core

=> Replace "Does" with "Do" in Q2.

=> Update the following actions:

**ACTION:** RAN2 kindly asks RAN3, SA2 and CT1 to take above agreements into consideration and respond to questions 1) and 2) above.

**ACTION:** RAN2 kindly asks SA3 to take above agreements into consideration and respond to questions 3), 4), 5), 6) and 7) above.

=> Replace "To enable UL early data transmission in Msg3 for a UE in RRC\_IDLE.." with "To support UL early data transmission in Msg3 during a RACH procedure initiated by a UE in RRC\_IDLE ..."

=> Replace "whether any of the following parameters that are included in Msg5" with "whether any of the following parameters that are optionally included in Msg5 (except *selectedPLMN-Identity*)"

=> Remove "Note that RAN2 has not discussed about the need and the content of Msg5 for EDT yet."

=> For Q5 and Q6 remove "at the time of suspension"

=> Remove Q2

=> Remove "particularly for the case where AS uses null ciphering algorithm for the data transmitted in Msg3."



Comeback with a revision based on the agreements above with the Tdoc number R2-1711976.

R2-1711976 [Draft] LS on Early Data Transmission Qualcomm IncorporatedLS out Rel-15 LTE\_eMTC4-  
Core, NB\_IOTenh2-Core

=> The LS is approved in R2-1711978.

☒ **[99bis#53][MTC/NB-IoT] EDT indication via PRACH (Ericsson)**

Email discussion on the details for EDT indication via PRACH pool partitioning, e.g., preamble/time/frequency/carrier domain.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-11-09

☒ **[99bis#54][MTC/NB-IoT] EDT AS/NAS interaction (MediaTek)**

Email discussion on the AS/NAS interaction and the possible impact on RAN3 related aspects with the intention to send an LS to RAN3 from this meeting if issues are identified  
Intended outcome: Approved LS

Deadline: Thursday 2017-10-26

=> The document describing the EDT procedure in R2-1712076 is endorsed.

=> The LS is approved in R2-1712077.

☒ **[99bis#55][MTC/NB-IoT] EDT RRC messages (Huawei)**

Email discussion on whether new RRC messages are introduced or existing RRC messages are extended to provide the required signalling for EDT

Intended outcome: Report to next meeting

Deadline: Thursday 2017-11-09

**For EDT:**

=> 36.331 draft CR for Rel-15 NB-IoT [Huawei]

=> 36.331 draft CR for Rel-15 MTC [Qualcomm]

=> 36.321 draft CR for Rel-15 NB-IoT [Ericsson]

=> 36.321 draft CR for Rel-15 MTC [Intel]

R2-1710521	Early Data Transmission over NAS	Ericsson	discussion	Rel-15	LTE_eMTC4-Core
R2-1710522	UP solution for early data transmission	Ericsson	discussion	Rel-15	LTE_eMTC4-Core
R2-1710523	General aspects of early data transmission	Ericsson	discussion	Rel-15	LTE_eMTC4-Core
R2-1710642	Early data transmission discussion	Intel Corporation		Rel-15	LTE_eMTC4-Core
R2-1710791	Details of Early data transmission for eFeMTC	Kyocera	discussion		
R2-1710889	[Draft] LS on Early Data Transmission	Qualcomm Incorporated	LS out	Rel-15	LTE_eMTC4-Core, NB_IOTenh2-Core
R2-1710896	Network initiated early UL data transmission	Nokia, Nokia Shanghai Bell	discussion		Rel-15 LTE_eMTC4-Core
R2-1710987	Further consideration on early data transmission in eFeMTC and FeNB-IoT	ZTE Wistron Telecom AB	discussion	Rel-15	LTE_eMTC4-Core
R2-1711158	Early data transmission for User plane CIoT optimisation	LG Electronics Inc.	discussion	Rel-15	LTE_feMTC R2-1709307
R2-1711159	Early data transmission for Control plane CIoT optimisation	LG Electronics Inc.	discussion	Rel-15	LTE_feMTC R2-1709309
R2-1711324	General discussion on early data transmission	Huawei, HiSilicon, Neul	discussion	Rel-15	NB_IOTenh2-Core, LTE_eMTC4-Core
R2-1711325	Early data transmission for NB-IoT and eMTC	Huawei, HiSilicon, Neul	discussion	Rel-15	NB_IOTenh2-Core, LTE_eMTC4-Core
R2-1711403	Early Data Transmission Failure Handling in MTC	LG Electronics Inc.	discussion	Rel-15	LTE_eMTC4-Core R2-1709458
R2-1711469	[Draft] LS on Early Data Transmission	Qualcomm Incorporated	LS out	Rel-15	LTE_eMTC4-Core, NB_IOTenh2-Core To:SA2
R2-1711555	PRACH for EDT requests	Sierra Wireless, S.A.	discussion	Rel-15	
R2-1711629	Reliability and Early Data transmission	MediaTek Beijing Inc.	discussion		

*The Tdocs below are moved from 9.13.1*

R2-1711402	Early Data Transmission Failure Handling in NB-IoT	LG Electronics Inc.	discussion	Rel-15	NB_IOTenh2-Core R2-1709457
R2-1711633	NPRACH resource partition for early data transmission	MediaTek Inc.	discussion		

### 9.14.3 System acquisition time enhancements

*System acquisition Enhancements for NB-IoT and MTC is treated jointly under this AI.*

*Including output from email discussion [99#46][MTC] Skipping SIB1-BR (Sierra Wireless)*

R2-1711477 [99#46] [MTC] Skipping SIB1-BR Sierra Wireless, S.A. (email rapporteur) discussion Rel-15

**Proposal 1: Enable a UE to re-use stored SIB information if it can be indicated that it is still valid upon re-entering a cell. Allow this within a 24 hour SIB validity period. Agree to implementation of a new indication within MIB of SIB changes.**

- Huawei is fine in principle. Intel wonders what is meant by stored SIB information. Huawei points out that this only applies to eMTC since for NB-IoT the valueTag is in MIB-NB. QC supports the proposal. ZTE supports the proposal and would like the indication also to be considered for NB-IoT and check if it would be beneficial. ZTE thinks maybe the bit has a different meaning for NB-IoT.
- Nokia asks whether this is really necessary and we should be careful using the spare bits in the MIB. Intel agrees with Nokia.
- Sierra Wireless thinks for this particular usecase it may not be so beneficial especially if the mobility is not high. Ericsson agrees. Intel thinks UE may anyway need to acquire SIB1-BR to check access barring.
- Sierra Wireless suggests to discuss other cases and come back to this particular case. Intel wonders how the bit is set with respect to SI modification period. Sierra Wireless and Huawei think this wouldn't be any different than the legacy mechanism. Ericsson agrees.

**Proposal 2: Implement an indication of SIB change for the purpose of saving power in the PSM use case.**

- QC wonders how the UE knows if it is still in the same cell. The UE can be in a cell with the same Physical ID. ZTE wonders if the same issue also applies to NB-IoT. ZTE also thinks that parameters should be carefully selected since there is a trade-off. QC proposes to capture in the spec that the UE is required to make sure that cellID has not changed.
- Huawei thinks it may be possible for the UE to figure out if it is still in the same cell or not based on other mechanisms.

**Proposal 3: We do not add new features to accommodate Idle mode UEs**

**Proposal 4: We discuss additional use case proposals if time permits.**

**Proposal 5: We agree to implementing a 1 or 2 bit indication in MIB and discuss various implementation options.**

- Ericsson thinks 1 bit should be fine. Huawei, Sierra Wireless, and Nokia agree. ZTE thinks 2 bits are needed.
- ZTE thinks the benefits would be limited if there is only 1 bit. Sierra Wireless explains that the concern is to address frequent changes which is not the case here. LG also agrees with the 1 bit.
- ZTE would like to have the values mapped to certain system information settings so that the NW can go in between. MediaTek thinks the mechanism proposed by ZTE would require more bits. MediaTek also thinks that 1 bit is enough. QC agrees with 1 bit.

**Proposal 6: Discuss whether we can agree to not have a separate EAB change indicating bit.**

- Ericsson wonders whether this indication also considers EAB change or it would be beneficial to introduce another bit for such indication.

- Huawei thinks same bit can also indicate the change in SIB14. QC explains that this would require all UEs to acquire system information every time SIB14 changes even though UEs do not intend to access the network.

<b>Agreements</b>
- Indicate in MIB whether there has been or not a system information change for a certain period of time. It is FFS how such period of time is provided.
- The indication in MIB is provided with 1 bit.
- The indication for EAB is FFS.

R2-1711649	Optimization of SI acquisition in MTC	LG Electronics Inc.	discussion	Rel-15	R2-1709283
R2-1710988	Further consideration on system acquisition time reduction in eFeMTC and FeNB-IoT	Wistron Telecom AB	discussion	Rel-15	LTE_eMTC4-Core ZTE
R2-1710518	Reduced system acquisition time	Ericsson	discussion	Rel-15	LTE_eMTC4-Core
R2-1710519	Skipping SIB1-BR acquisition	Ericsson	discussion	Rel-15	LTE_eMTC4-Core
R2-1710520	DRAFT LS reply on system acquisition time reduction for Rel-15 LTE-MTC	Ericsson	LS out	Rel-15	LTE_eMTC4-Core
R2-1711215	Accumulation across SIB1-BR/SI modification period	Huawei, HiSilicon	discussion	Rel-15	LTE_eMTC4-Core
R2-1711216	[DRAFT] Reply LS on System acquisition time reduction for Rel-15 LTE MTC	HiSilicon	LS out	Rel-15	LTE_eMTC4-Core Huawei,
R2-1711217	Skip system information reading for MTC upon cell reselection	HiSilicon	discussion	Rel-15	LTE_eMTC4-Core Huawei,
R2-1711334	System information acquisition enhancements for NB-IoT	HiSilicon, Neul	discussion	Rel-15	NB_IOTenh2-Core, LTE_eMTC4-Core
R2-1711481	One and two-bit indications in MIB of SIB1-BR changes	Sierra Wireless, S.A.	discussion	Rel-15	
R2-1711651	Clarification of parameters for skipping MIB-NB	LG Electronics Inc.	discussion	Rel-15	
R2-1711826	NB-IoT_UE SI on demand	Vodafone Group Plc.	discussion		

*The Tdocs below are moved from 9.13.2*

R2-1710794	Skipping MIB-NB Acquisition for NB-IOT UE	MediaTek Inc.	discussion		
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#### 9.14.4 Relaxed monitoring for cell reselection

*Relaxed monitoring for cell reselection for MTC is treated jointly with NB-IoT under AI 9.13.3. Do not use this AI for any item that can be discussed jointly.*

### 9.14.5 Access/load control of idle mode UEs

R2-1711218	Improved access/load control of idle mode Ues 15 LTE_eMTC4-Core	Huawei, HiSilicon	discussion	Rel-
R2-1711160	Access barring for CE level in feMTC LTE_feMTC R2-1709311	LG Electronics Inc.	discussion	Rel-15
R2-1710991	Further consideration on access control in eFeMTC discussion Rel-15 LTE_eMTC4-Core	ZTE Wistron Telecom AB		
R2-1710792	CE-based access barring and load balancing for idle mode UEs for eFeMTC discussion			Kyocera
R2-1710354	Improved Access and Load Control for Idle Mode UEs LTE_eMTC4-Core	Fujitsu	discussion	Rel-15
R2-1710532	Improved Idle Mode Load control for efeMTC UEs LTE_eMTC4-Core	Ericsson	discussion	Rel-15
R2-1710644	CE level based access barring and load control for eFeMTC discussion Rel-15 LTE_eMTC4-Core			Intel Corporation
R2-1711418	Improved Idle Mode Load Control for efeMTC UEs 14.4.0 B LTE_eMTC4-Core	Ericsson	draftCR	Rel-15 36.331

### 9.14.6 Uplink HARQ-ACK feedback

R2-1711359	RA enhancement using HARQ feedback 36.321 LTE_eMTC4-Core R2-1709140	LG Electronics Inc.	discussion	Rel-15
R2-1710643	UL HARQ feedback in efeMTC Core To:SA1, CT1 Cc:SA2	Intel Corporation	discussion	Rel-15 LTE_eMTC4-
R2-1711300	DRX enhancement using HARQ feedback 36.321 LTE_eMTC4-Core R2-1709141	LG Electronics Inc.	discussion	Rel-15
R2-1711310	DRX enhancement using HARQ feedback 14.4.0 B LTE_eMTC4-Core	LG Electronics Inc.	draftCR	Rel-15 36.321
R2-1710524	Uplink HARQ-ACK feedback for MTC LTE_eMTC4-Core	Ericsson	draftCR	Rel-15 36.306 14.4.0 B
R2-1710525	Uplink HARQ-ACK feedback for MTC LTE_eMTC4-Core	Ericsson	draftCR	Rel-15 36.321 14.4.0 B
R2-1710526	Uplink HARQ-ACK feedback for MTC LTE_eMTC4-Core To:CT1	Ericsson	draftCR	Rel-15 36.331 14.4.0 B
R2-1710992	Consideration on Uplink HARQ-ACK feedback in eFeMTC discussion Rel-15 LTE_eMTC4-Core	ZTE Wistron Telecom AB		
R2-1711219	Uplink HARQ-ACK feedback for Rel-15 MTC 15 LTE_eMTC4-Core	Huawei, HiSilicon	discussion	Rel-

### 9.14.7 Increased PDSCH spectral efficiency

R2-1711220	Increased PDSCH spectral efficiency for Rel-15 MTC Rel-15 LTE_eMTC4-Core	Huawei, HiSilicon	discussion	
R2-1711221	[DRAFT] LS on signalling support of 64QAM for Rel-15 efeMTC out Rel-15 LTE_eMTC4-Core	Huawei, HiSilicon		LS
R2-1710528	Increased PDSCH spectral efficiency LTE_eMTC4-Core	Ericsson	draftCR	Rel-15 36.306 14.4.0 B
R2-1710529	Increased PDSCH spectral efficiency LTE_eMTC4-Core	Ericsson	draftCR	Rel-15 36.331 14.4.0 B



### 9.14.8 Increased PUSCH spectral efficiency

R2-1711553	Signaling for Sub-PRB capability indication 15	Sierra Wireless, S.A.	discussion	Rel-15
R2-1710530	Increased PUSCH spectral efficiency LTE_eMTC4-Core	Ericsson	draftCR Rel-15 36.306	14.4.0 B
R2-1710531	Increased PUSCH spectral efficiency LTE_eMTC4-Core	Ericsson	draftCR Rel-15 36.331	14.4.0 B

### 9.14.9 Other

*Including higher UE velocity, lower UE power class, wake-up signaling, CRS muting etc.*

R2-1710749	Wake-up signal for NB-IoT & eMTC Core, LTE_eMTC4-Core R2-1708284	Ericsson	discussion	Rel-15 NB_IOTenh2-
R2-1710641	WUS consideration for eFeMTC Core	Intel Corporation	discussion	Rel-15 LTE_eMTC4-
R2-1711214	Power saving signal or channel in NB-IoT and eMTC Rel-15 LTE_eMTC4-Core	Huawei, HiSilicon, Neul	discussion	
R2-1710515	Lower power class UE	Ericsson	discussion	Rel-15 LTE_eMTC4-Core
R2-1710516	Introducing 14 dBm UE power class LTE_eMTC4-Core	Ericsson	draftCR Rel-15 36.331	14.4.0 B
R2-1710517	Introducing 14 dBm UE power class LTE_eMTC4-Core	Ericsson	draftCR Rel-15 36.304	14.4.0 B
R2-1710527	CRS muting	Ericsson	discussion	Rel-15 LTE_eMTC4-Core R2-1708633
R2-1710533	Higher velocity for CEModeA UE in eFeMTC Core	Ericsson	discussion	LTE_eMTC4-
R2-1711005	Consideration on supporting lower UE power class in eFeMTC discussion Rel-15 LTE_eMTC4-Core	ZTE Wistron Telecom AB		
R2-1711222	Lower UE power class for Rel-15 MTC LTE_eMTC4-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1711223	[DRAFT] Reply LS on new UE power class for Rel-15 eFeMTC out Rel-15 LTE_eMTC4-Core	Huawei, HiSilicon		LS
R2-1711455	Introducing 14 dBm UE power class LTE_eMTC4-Core	Ericsson	draftCR Rel-15 36.306	14.4.0 B

## 9.15 Highly Reliable Low Latency Communication for LTE

*LTE\_HRLLC-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-171489*

*Time budget: 0.5 TU*

*For this meeting, items with RAN2 only impact will be discussed (e.g. packet duplication). Items that are related to RAN1 will be discussed from RAN2#100. (This guidance is intended to clarify the WID which is contradictory in allocating 0.5 TU to RAN2 but also saying that RAN2 work doesn't start until RAN2#100)*

*Documents in this agenda item will be handled in a break out session*

R2-1710501	Work Plan for URLLC => Noted - LG think we should wait for NR progress on duplication topic.	Ericsson	discussion	Rel-15 LTE_HRLLC-Core
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#### **Duplication:**

R2-1711001	PDCP data duplication in LTE LTE_HRLLC-Core P1	Nokia, Nokia Shanghai Bell	discussion	Rel-15
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- Nokia think baseline the existing agreements we got in NR.
- P2
- Huawei wonder whether CA is in the WI scope. Nokia and Ericsson think it is in the scope.
- P3
- Huawei think in EN-DC, AM bearer is not supported. Ericsson and Nokia think it should be supported in HRLLC.
- Intel think we should focus on UM mode.
- P5
- OPPO prefer to reuse NR agreement for leg configuration.
- P9
- OPPO wonder the meaning of duplication leg.

Agreements:

- 1 PDCP data duplication for LTE shall assume NR PDCP data duplication as baseline.
- 2 RAN2 works on PDCP data duplication for both CA and DC.
- 3a At least UM bearers are supported for PDCP duplication via CA.
- 4 PDCP enables reordering and duplication detection when PDCP duplication is configured.
- 6 MAC CE is used for activation and deactivation of PDCP duplication for each RB configured with duplication.
- 7 For CA case, LCP applies configured LCH to carriers/cells restriction for LCHs of a duplication RB and the restriction is lifted when duplication is deactivated as agreed in NR.
- 8 PDCP duplication is configured by RRC. The configuration also indicates whether the duplication is immediately started, which is the same as NR.
- 9 LCH to carriers/cells restriction is configured for CA duplication.

R2-1710502	Packet duplication in LTE	Ericsson	discussion	Rel-15	LTE_HRLLC-Core
	=> Noted				
R2-1711115	Discussion on packet duplication	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core

**Latency:**

R2-1711117	Latency analysis for LTE HRLLC	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core
	<ul style="list-style-type: none"> <li>- Huawei think SPS can be treated a kind of UL grant-free.</li> <li>- Ericsson prefer to use SPS scheduling.</li> <li>- Ericsson would like to see the gain compared with SPS. Huawei think it should be discussed in RAN1.</li> <li>- Nokia would like to study it further to identify the benefit.</li> <li>- Ericsson wonder whether we can sue SPS framework for this.</li> </ul> => Noted				

R2-1710503	RAN2 Techniques for Latency	Ericsson	discussion	Rel-15	LTE_HRLLC-Core
R2-1711118	RAN2 impacts of UL grant-free	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core

**Repetition:**

R2-1710504	RAN2 Techniques for reliability	Ericsson	discussion	Rel-15	LTE_HRLLC-Core
	P1 <ul style="list-style-type: none"> <li>- Nokia wonder the meaning of “build on”. Nokia think it is not possible to fully reuse the configuration.</li> <li>- Intel and LG think the latency and reliability should be considered together.</li> </ul> => Noted				
R2-1711116	Potential enhancement for HRLLC based on sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core

## 9.16 UL data compression in LTE

(LTE\_UDC-Core; leading WG: RAN2; Rel-15; started Sep 17; target: Mar 18; WID RP-172076)

Time budget: 1.0 TU

*Documents in this agenda item will be handled in a break out session*

- R2-1710718 Work Plan for UDC CATT Work Plan Rel-15  
=> Noted
- R2-1710719 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.300 14.4.0 B  
=> Used as the baseline for running stage-2 CR.  
=> Update according to the agreements from this meeting.

### **General configuration:**

- R2-1710990 Discussion on UDC Configurations MediaTek Inc. discussion Rel-15 LTE\_UDC-Core
- P1
- LG would like to know how to specify it in RAN2 spec. MTK think it is no need to specify the detail.
  - CATT think it should be left to UE implementation to use static-Huffman tree or not.
  - Ericsson prefer proposal 1 for eNB complexity.
- P2
- Ericsson think smaller buffer size beneficial.
  - Huawei think 4K is not evaluated in study phase. Ericsson provides the results in R2-1710410.
  - Nokia wonder how to distinguish different size. MTK think it should be indicated by eNB.
  - Intel and Nokia prefer to use one buffer size for simplicity.
- P6
- CATT wonder how to specify the restriction.
  - LG don't want to restrict the number.

#### Agreements:

- 1 Specify in RAN2 spec static-Huffman tree as the DEFLATE compression strategy for UDC.
- 2 Specify in RAN2 spec 8K as the maximum DEFLATE compression memory size of UE for UDC. eNB can only configure 2K, 4K and 8K memory sizes. Memory size reconfiguration is not supported. FFS handover case.
- 3 Specify the pre-defined parameters except memory size for UDC in PDCP and memory size in RRC.
- 4 Specify in RRC that UDC is configured under PDCP config.
- 5 Specify in RRC that UDC cannot be configured if UL or bi-direction RoHC is configured for a DRB.
- 6 The maximum number of UDC DRB is 2.

- R2-1710989 Discussion on Byte-alignment Operation for UDC MediaTek Inc. discussion Rel-15 LTE\_UDC-Core
- Ericsson wonder the impact on eNB side. MTK think eNB should know and the implementation complexity is simple.

#### Agreements:

- 1 Specify Z\_SYNC\_FLUSH as the DEFLATE byte-alignment option with corresponding reference, RFC 1979.

### **Predefined dictionary:**

- R2-1710453 Pre-Defined Dictionary for UDC Ericsson discussion Rel-15
- LG think the use case is very limited.

- Nokia wonder whether it is configured by a separate configuration.
  - Huawei wonder which type of predefined dictionary used. Ericsson think both.
  - LG wonder how UE knows the operator-defined dictionary. Ericsson think it depends on operator.
  - MTK prefer to have further discussion before decision.
- => Noted.

☒ **[99bis#29][LTE/UDC] Operator controlled dictionary issue [MediaTek]**

Clarify the behaviour and procedure  
 Intended outcome: Report to next meeting  
 Deadline: Thursday 2017-11-09

R2-1710725 Initial Consideration on Pre-defined Dictionary for UDC CATT discussion Rel-15  
 LTE\_UDC-Core

P1

- LG wonder how to define SIP dictionary in RAN2 spec. CATT point it is defined in RFC.
- Nokia think it is beyond RAN2 scope. MTK and CATT think it impact PDCP behaviour.

Agreements

- 1 SIP dictionary defined in RFC 3485 is used as pre-defined dictionary in UDC.

R2-1710705 Discussion on pre-defined dictionary for UDC Huawei, HiSilicon discussion Rel-15  
 15 LTE\_UDC-Core

**Buffer size:**

R2-1710410 Buffer Size Allocation Ericsson discussion Rel-15

=> Noted

R2-1710704 Discussion on buffer size impact for UDC Huawei, HiSilicon discussion Rel-15  
 LTE\_UDC-Core

**Signalling and procedure:**

R2-1710721 Consideration on Signalling and Procedures for UDC CATT discussion Rel-15  
 LTE\_UDC-Core

Agreements:

- 1 Dedicated RRC signalling is used to configure UE to setup/release UDC per DRB.
- 2 UDC is only used in RLC AM.
- 3 UDC context is reset and release during inter-node handover.

R2-1710707 Discussion on signaling procedures for UDC Huawei, HiSilicon discussion Rel-15  
 15 LTE\_UDC-Core

**PDCP impact:**

R2-1710720 Consideration on UDC Header Content CATT discussion Rel-15 LTE\_UDC-Core

P1

- LG wonder the behaviour after checksum failure. LG think checksum is not needed.
- MTK and CATT think checksum is necessary even check failure is rare case.
- Ericsson also support checksum.
- Huawei think we should stick to the conclusion in study phase to introduce checksum bits.

P3

- LG wonder why FU bit is involved. LG think eNB can adjust DRBs.

P6

- Softbank concern to left it to UE implementation.

Agreements:

- 1 4 checksum bits are involved in UDC header. The exact number of the bit can be revisited if any serious issue identified.

2 FU bit is involved in UDC header to indicate whether the current packet needs to be processed by UDC function or not.

R2-1710706 Discussion on compressed data format for UDC Huawei, HiSilicon discussion Rel-15 LTE\_UDC-Core

**323 CR:**

R2-1710723 PDCP impact analysis CATT discussion Rel-15 LTE\_UDC-Core  
 R2-1710724 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.323 14.4.0 B LTE\_UDC-Core  
 R2-1710471 Selection of Pre-defined Dictionary for UDC Ericsson CR Rel-15 36.323 14.4.0 0202 - B LTE\_UDC-Core

☒ **[99bis#06][LTE/UDC] Running 36.323 CR for introducing UDC (CATT)**

Capture related agreements from this meeting  
 Intended outcome: Endorsed running CR  
 Deadline: Thursday 2017-10-26  
 => Endorsed as a running CR in R2-1712070

**331 CR:**

R2-1710722 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.331 14.4.0 B LTE\_UDC-Core  
 R2-1710472 Pre-Defined Dictionary Configuration for UDC Ericsson CR Rel-15 36.331 14.4.0 3077 - B LTE\_UDC-Core  
 R2-1710413 UDC Buffer Size Selection Ericsson CR Rel-15 36.331 14.4.0 3076 - B LTE\_UDC-Core

☒ **[99bis#07][LTE/UDC] Running 36.331 CR for introducing UDC (CATT)**

Capture related agreements from this meeting  
 Intended outcome: Endorsed running CR  
 Deadline: Thursday 2017-10-26  
 => Endorsed as a running CR in R2-1712071

**Others:**

R2-1710703 Discussion on the scope of the WI UDC Huawei, HiSilicon discussion Rel-15 LTE\_UDC-Core

## 9.17 Other LTE Rel-15 WIs

*This agenda item may be used for documents relating to Rel-15 WIs with no allocated RAN2 time but which might have minor RAN2 impact (e.g. CT/SA WIs for which we have received an LS requesting RAN2 action)*

*This AI is to enable documents to be submitted for information. No time budget is allocated for this meeting and will be discussed starting from RAN2#100.*

## 9.18 LTE TEI15 enhancements

*Small Technical Enhancements affecting LTE Rel-15 that do not belong to any Rel-15 WI.*

*Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!*

*Time budget: 0 TU*

*This AI is to enable TEI15 proposals to be submitted for information. No time budget is allocated for this meeting and will be discussed starting from RAN2#100.*

R2-1710912	Overview on new LTE measurements Rel-15 TEI15 R2-1709465	Huawei, HiSilicon, China Telecom	discussion
R2-1710913	Discussion on new measurement on PRB usage distribution Telecom discussion Rel-15 TEI15 R2-1709467	Huawei, HiSilicon, China Telecom	
R2-1710914	Discussion on new measurement on IP throughput distribution Telecom discussion Rel-15 TEI15 R2-1709468	Huawei, HiSilicon, China Telecom	
R2-1710915	Introduction of new measurement on PRB usage distribution Telecom CR Rel-15 36.314 14.0.0 0042 - B	Huawei, HiSilicon, China Telecom	TEI15
R2-1710916	Introduction of new measurement on IP throughput distribution Telecom CR Rel-15 36.314 14.0.0 0043 - B	Huawei, HiSilicon, China Telecom	TEI15
R2-1711006	Inbound mobility to the shared non-CSG small cells 15 TEI15	SoftBank Corp.	discussion Rel-
R2-1711255	Control Plane latency reduction	Ericsson other	Rel-15 TEI15
R2-1711257	Control Plane latency reduction	Ericsson draftCR	Rel-15 36.331 14.4.0 B TEI15
R2-1711258	Control Plane latency reduction	Ericsson draftCR	Rel-15 36.306 14.4.0 B TEI15
R2-1711345	Discussion on new measurements on number of active UEs discussion	China Telecommunications	
R2-1711349	Introduction of new measurement on number of active UEs Rel-15 36.314 14.0.0 0044 - B	China Telecommunications	CR TEI15
R2-1711474	Marking and unmarking the UE for high-speed-dedicated LTE network discussion Rel-15 TEI15	Intel Corporation	
R2-1711810	Considerations on Cell Reselection in High Speed Railway Scenario Rel-15 TEI15	CATT	discussion

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## 10 WI: New Radio (NR) Access Technology

(NR\_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-172115)

### 10.1 Organisational

*Incoming LSs, work plan, status from other groups, etc.*

*Liaisons to RAN2*

R2-1710005	Reply LS on NR Idle Mode procedures (C1-173749; contact: Qualcomm) 15 5GS_Ph1-CT To:SA2, RAN2, SA1 Cc:RAN3	CT1	LS in	Rel-
	=> Noted			
R2-1710010	Reply LS on BWP operation in NR (R1-1716875; contact: Samsung) 15 NR_newRAT-Core To:RAN2	RAN1	LS in	Rel-
	=> Noted			
R2-1710025	Reply LS response on Random Access (R1-1715315; contact: Samsung) 15 NR_newRAT-Core To:RAN2	RAN1	LS in	Rel-
	=> Noted			
R2-1710029	LS on RRC parameters for NR (R1-1715338; contact: Ericsson) NR_newRAT To:RAN2	RAN1	LS in	Rel-15
	=> Noted			
R2-1710031	Reply LS on multiple SSBs within a wideband carrier (R1-1716907; contact: Ericsson) LS in Rel-15 To:RAN2 Cc:RAN4			RAN1
	=> Noted			

- R2-1710032 LS on NR Paging Occasion (R1-1716918; contact: Huawei) RAN1 LS in Rel-15  
 NR\_newRAT To:RAN1 Cc:RAN2
- DOCOMO ask whether we should discuss this before December.
  - LG have a paper addressing this question and think the LTE definition can be reused.
  - Huawei understand that RAN1 is proceeding without this information.
- => Offline to discuss what we can reply (if not possible to reply then can be included in the schedule for November meeting) (Offline discussion #06, LG)
- R2-1712014 Summary of offline discussion #06 on NR Paging Occasion LG Electronics Inc  
 => Noted
- R2-1712015 [DRAFT] Response LS on NR Paging Occasion LGE LS out Rel-15 NR\_newRAT-Core  
 To:RAN1=> Can keep reference to current LTE.
- => Remove second paragraph
  - => Respond to RAN1 that the "PO defines a number of slots where the UE has to monitor the PDCCH (reference stage 2). RAN2 has not decided whether or not the message is in the same slot(s). RAN2 assume that RAN1 can make this decision. RAN2 think that paging design should consider UE power consumption"
  - => Approved in R2-1712023
- R2-1710033 Reply LS on UE categories and capabilities (R1-1716924; contact: NTT DOCOMO)RAN1 LS in  
 Rel-15 To:RAN2 Cc:RAN4
- Intel think the RAN1 response if that the explicit category is not needed if the peak data rate supported by the UE is greater than the calculated data rate. Wonder on other company understanding. Ericsson this is answered that a UE that supports DC will not support a data rate lower than the calculated data rate.
  - MediaTek think it is open for the non DC case.
- => Noted
- R2-1710035 LS on support of Trace and MDT in NG-RAN in rel-15 (R3-173422; contact: Huawei) RAN3  
 LS in Rel-15 NR\_newRAT-Core To:RAN2, SA5
- Huawei understand that MDT is not in the scope of NR. Qualcomm wonder whether this is just for NR or also eLTE.
  - ZTE wonder if we have agreed that MDT is not supported in NR. Huawei think there is no MDT in the WID.
- => Respond to MDT is not part or the NR WID scope. For LTE connected to 5GC then MDT can be supported over the radio interface the same as LTE connected to EPC.  
 => Draft LS in R2-1711931 (Offline discussion #07, Huawei)
- R2-1711931 [DRAFT] Reply LS to RAN3 on MDT Huawei LS out Rel-15 NR\_newRAT-Core  
 To:RAN3 Cc:SA5
- => Approved in R2-1712041
- R2-1710036 LS on definition of RAN Notification Area in inactive state (R3-173427; contact: Nokia) RAN3  
 LS in Rel-15 NR\_newRAT To:RAN2
- ZTE ask what package means. Nokia explain that RAN3 would like to support all 3 options.
  - LG think option 3 is not one that we have discussed and also would prefer to have a single solution.
  - Vodafone think this assumes that the cell id coding is the same as today, but think that for NR is might be bigger than for LTE and this may have an impact.
- => Offline discussion to see how we can respond to RAN3. If not conclusion then can be discussed on Thursday based on contributions. (Offline discussion #08, Nokia)
- R2-1710037 Reply LS on shared baseband capabilities for MR-DC (R4-1708284; contact: Huawei) RAN4  
 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1
- => Noted

- R2-1710039 Reply LS on UE measurement capabilities across LTE and NR (R4-1708694; contact: Huawei)  
RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1  
=> Noted
- R2-1710045 LS on Mixed numerologies FDM operation (R4-1708864; contact: Intel) RAN4 LS in Rel-15 NR\_newRAT To:RAN1, RAN2  
- Ericsson think the LS was sent before the RAN1 down prioritisation of mixed numerologies, that only one BWP is active at a time.  
- Intel think the RAN1 agreement is aligned with the RAN4 assumption.  
=> Draft LS to RAN4 to indicate that there is no additional RAN2 impact due to the RAN4 agreements. Draft LS in R2-1711932 (Offline discussion #09, Intel)
- R2-1711932 [DRAFT] Reply LS on Mixed numerologies FDM operation Intel LS out Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN1  
=> Approved in R2-1712027
- R2-1710047 LS on Definitions of Intra-frequency and Inter-frequency Measurements (R4-1709108; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:RAN2 Cc:RAN1  
=> Noted
- R2-1710051 LS on scenarios of multiple SSB (R4-1709890; contact: Huawei) RAN4 LS in Rel-15 NR\_newRAT To:RAN2 Cc:RAN1  
=> Noted
- R2-1710048 LS on uplink and downlink channel bandwidth for NR (R4-1709136; contact: Intel) RAN4 LS in Rel-15 NR\_newRAT To:RAN1, RAN2  
=> Noted
- R2-1710054 LS on NR band numbering (R4-1710045; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2, RAN3  
=> Noted
- R2-1710055 Reply LS to RAN2 for NR UE categories and UE capabilities (R4-1710079; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:RAN2 Cc:RAN, RAN1  
- Intel wonder if the RAN4 question that says " per-cell, per-cell-group and per-UE " means we need to provide capability per cell group.  
=> Noted
- R2-1710058 LS on IMT-2020 submission (RP-172099; contact: NEC) RAN LS in Rel-15 To:SA, RAN1, RAN2, RAN3, RAN4, RAN5 Cc:CT, RAN6  
=> Noted
- R2-1710059 LS on single Tx switched UL (RP-172100; contact: Qualcomm, Intel) RAN LS in Rel-15 NR\_newRAT To:RAN4, RAN2 Cc:RAN1, RAN3  
=> Noted
- R2-1710065 LS on coexistence between RRC inactive and dual connectivity (S2-176158; contact: Qualcomm) SA2 LS in Rel-15 5GS\_Ph1 To:RAN2, RAN3  
- Intel think we agreed not to enhance in Rel-15 and propose to inform SA2 of this.  
- ZTE have a similar understanding as Intel.  
- Ericsson think we should come back to this later after the RRC Connection Reconfiguration is settled.  
- Samsung think a lot of time was spent on this in the last meeting and we decided not to do it for Rel-15. Huawei have the same view as Samsung. LG also have the same view  
=> Respond to SA2 that we decided not to work on this optimisation for Rel-15.



- R2-1710242 LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR (S2-176689; contact: Intel) SA2 LS in Rel-15 To:RAN1, RAN2, RAN4
- Ericsson think this is not a priority. Intel think that SA2 stage 2 completion is December.
  - Vivo think we can discuss restrictions based on contributions.
- => Noted
- R2-1710244 LS on UE/RAN Radio information and Compatibility Request Response (S2-176691; contact: Qualcomm) SA2 LS in Rel-15 5GS\_Ph1 To:RAN2, RAN3
- Qualcomm suggest that it is safest to respond that it is possible that there are some radio capabilities related to voice support, then they will support this procedure in the network.
  - DOCOMO think that such capabilities might exist but think the capability match procedure might not be needed.
  - Qualcomm think this might be less of an issue for NR compared to LTE.
  - Ericsson think we have not yet discussed voice capability yet.
- => Respond that so far we have not discussed voice capabilities much but we cannot say at this stage that there will be not radio capabilities related to voice support.
- => Draft LS in R2-1711934 (Offline discussion #11, Qualcomm)
- R2-1711934 [DRAFT] Reply LS on UE/RAN Radio information and Compatibility Request Response Qualcomm LS out Rel-15 NR\_newRAT-Core To:SA2 Cc:RAN3
- => Action should be SA2
- => Approved in R2-1712049
- R2-1711007 Response LS on default DRB establishment for PDU session (S2-176475; contact: InterDigital) SA2 LS in Rel-15 5GS\_Ph1 To:RAN2 Cc:RAN3
- => Noted
- R2-1711842 LS on RRC parameters for NR, RAN WG 1
- This is not yet considered in the TP submitted to this meeting
- => Noted

*Liaisons to RAN2 with copy of agreements to take into account*

- R2-1710011 LS on NR UL transmission without UL grant (R1-1714995; contact: NTT DOCOMO) RAN1  
LS in Rel-15 NR\_newRAT To:RAN2
- => Noted without presentation
- R2-1710012 LS on Further agreements for Bandwidth part operation (R1-1714996; contact: LGE) RAN1  
LS in Rel-15 NR\_newRAT To:RAN2 Cc:RAN4
- => Noted without presentation
- R2-1710015 LS on initial access with SUL (R1-1715260; contact: Huawei) RAN1 LS in Rel-15  
NR\_newRAT-Core To:RAN2
- => Noted
- R2-1710024 LS on power sharing for LTE-NR Dual Connectivity (R1-1715313; contact: Ericsson) RAN1  
LS in Rel-15 NR\_newRAT To:RAN4, RAN2
- => Noted without presentation

*Liaisons with RAN2 in CC*

- R2-1710004 Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity (C1-173748; contact: Ericsson)  
CT1 LS in Rel-15 EDCE5 To:SA3, CT4 Cc:SA2, RAN2, RAN3
- R2-1710026 LS on NR initial access and mobility (R1-1715316; contact: NTT DOCOMO) RAN1 LS in  
Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN2

- R2-1710030 Reply LS on Channel Raster and Synchronization Channel Raster (R1-1716906; contact: Ericsson) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN2
- R2-1710046 LS on RSRP Measurements for Mobility in NR (R4-1709017; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:RAN1 Cc:RAN2
- R2-1710049 LS on Channel Raster and Synchronization Channel Raster (R4-1709175; contact: Qualcomm) RAN4 LS in Rel-15 To:RAN1 Cc:RAN2
- R2-1710052 UE timing advance adjustment step size (R4-1709899; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:RAN1 Cc:RAN2
- R2-1710053 LS on RSSI Definition in Signal Quality Measurements for Mobility in NR (R4-1709910; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:RAN1 Cc:RAN2
- R2-1710060 LS on NR UE Category (RP-172113; contact: MediaTek) RAN LS in Rel-15 NR\_newRAT To:RAN1 Cc:RAN2, RAN4
- R2-1710062 Reply LS on unified Access Control for 5G NR (S1-173552; contact: Nokia) SA1 LS in Rel-15 SMARTER, NR\_newRAT To:CT1, SA2, RAN2 Cc:CT6
- => Above LSs noted without presentation

*New LS in (during RAN2#99bis)*

- New LSs in
- R2-1711964 Reply LS on mixed numerologies FDM operation (R1-1718829; contact: Intel) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN2
- => Noted
- R2-1711987 NR UE information elements (R4-1711581; contact: Nokia) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2
- => Noted
- R2-1712017 Reply LS on NR handover related parameters (R4-1710373; contact: Intel) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1
- => Noted

*Rapporteur inputs*

- R2-1710077 RAN WG's progress on NR WI in the August and September meetings 2017 NTT DOCOMO, INC. (Rapporteur) discussion Rel-15 NR\_newRAT-Core
- => Noted
- R2-1710114 RAN2 TS status check towards Stage-2/3 freeze in Dec. 2017 NTT DOCOMO, INC. (Rapporteur) discussion Rel-15 NR\_newRAT-Core
- => Can be updated for the next meeting.
- R2-1710251 UE RF related parameters and features for NR NTT DOCOMO, INC. discussion Rel-15 NR\_newRAT-Core
- => Noted
- R2-1710252 [DRAFT] LS on UE RF related parameters for NR NTT DOCOMO, INC. LS out Rel-15 NR\_newRAT-Core
- Ericsson suggest to elaborate on the ARFCN and ask what the ARFCN points to.
- => Revised in R2-1711935 (Offline discussion #12, DOCOMO)
- R2-1711935 [DRAFT] LS on UE RF related parameters for NR NTT DOCOMO, INC. LS out Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN3
- => Remove background on ARFCN and just ask for definition of ARFCN for purpose of indicating the centre of the carrier and the location of the SSB.
- => Revised in R2-1712022

R2-1712022 [DRAFT] LS on UE RF related parameters for NR NTT DOCOMO, INC. LS out Rel-15  
NR\_newRAT-Core To:RAN4 Cc:RAN3  
=> Approved in R2-1712028

## 10.2 Stage 2 and common UP/CP aspects

*For this meeting, proposals to the stage 2 should be submitted with a TP to show the impact to the stage 2 specifications.*

### 10.2.1 Stage 2 TSs and running CR

*Latest TS 38.300, TS 37.340 and running CR to 36.300, other rapporteur inputs, anything related to specification methodology. Please submit any new text proposals to the appropriate agenda item.*

R2-1710693 NG-RAN Stage 2 Rapporteur (Nokia) draft TSRel-15 38.300 1.0.1 NR\_newRAT-Core  
- Nokia explain it included a few updates compared to last version.  
=> Endorsed in R2-1711936  
=> Revised in R2-1711972

R2-1711972 NG-RAN Stage 2 Rapporteur (Nokia) draft TSRel-15 38.300 1.1.1 NR\_newRAT-Core

- ☒ **[99bis#03][NR] Stage 2 TS (Nokia)**  
Capture agreements from this meeting  
Intended outcome: Endorsed TS  
Deadline: Thursday 2017-10-26  
=> Endorsed as v1.1.1 in R2-1711972

R2-1711526 TS 37.340 v1.0.2 Rapporteur (ZTE Corporation) draft TSRel-15 37.340 1.0.2 NR\_newRAT-Core  
- ZTE explain it included a few updates compared to last version.  
=> Endorsed in R2-1711937

- ☒ **[99bis#04][NR] TS 37.340 (ZTE)**  
Capture agreements from this meeting  
Intended outcome: Endorsed TS  
Deadline: Thursday 2017-10-26  
=> Endorsed as v1.1.1 in R2-1712072

R2-1710333 Consideration on the intra-NR Dual connectivity ZTE Corporation discussion Rel-15 NR\_newRAT-Core  
=> Current agreements on NR-NR DC to be captured in a running TP/CR for 37.340 (not to be included in the Dec 17 spec)  
=> Revisit the discussion after Dec 17

### 10.2.2 User Plane

*No documents should be submitted to 10.2.2. Please submit to 10.2.2.x.*

#### 10.2.2.1 Bearer type harmonisation

*Any remaining stage 2 aspects relating to bearer type harmonisation*

*This agenda item is relevant to EN-DC completion and standalone operation.*

*Maximum 1 tdoc per company*

R2-1710140 Impact on PDCP version reconfiguration due to SidelinkUEInformation OPPO discussion Rel-15 NR\_newRAT-Core

- Intel accept that this can happen sometimes but think that handover can be used in cases that the network thinks it could happen. Ericsson agrees with Intel and think the without handover case can only be used in cases that the network is confident that there are no UL packets in transmission.
  - LG think this is a problem for any UE initiated UL messages.
  - Qualcomm ask how the network can know if there is a message in the UEs buffer or not. Lenovo agree that the network cannot know and also think it is a problem for the network knowing which PDCP to expect and hence it is not a problem for the UE.
  - Samsung have the same opinion as Intel that this can be handled by network implementation. CATT think the handover option is there and can be used for all cases.
- => Noted

R2-1711517 Security algorithms for NR PDCP at EN-DC capable eNB Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core

- ZTE suggest that the algorithm could be associated with the key that is used.
  - IDC wonder why the algorithm is not associated with the PDCP version rather than the termination point.
  - Vodafone think the proposal is against what we have agreed before.
  - MediaTek think there is no advantage in restricting the usage of algorithms as UE anyway always needs to support all algorithms. Qualcomm explain it relates to the architecture in the UE and could mean to support the NR algorithms in the LTE side of the modem.
  - Intel wonder what is the expectation for unified split bearers as the UE doesn't know the anchor point.
  - OPPO wonder if the LTE algorithm can support 9kbyte PDU size for NR-PDCP.
  - Ericsson think we should also discuss how many algorithms can be configured in the UE.
  - CATT think this is just a recommendation for the network. Qualcomm think that the intent is to avoid mis-configuration of the UE.
  - LG think it should be possible to configure NR algorithm for NR PDCP in the master eNB.
- => Offline discussion to conclude the support for LTE and NR security algorithms on the LTE side (i.e. for cases where the (LTE or NR)PDCP used KeNB). Also discuss the signalling required to configure the algorithms. (Offline discussion #13, Qualcomm)
- Update from offline: Address online during email discussion#30 report.

R2-1710325 Remaining issues of bearer type harmonization ZTE Corporation discussion Rel-15 NR\_newRAT-Core

- Huawei think if the UE supports EN-DC then the network can assume that the UE support NR-PDCP. ZTE think that the aspect related to RoHC profile support then some capabilities would be needed.
- P2
- Ericsson think that the 2C option should be supported and think from the signalling and UE side there is no reason not to support it.
  - Huawei have the same view as Ericsson. Intel also have the same view and think that no restriction is needed from the UE point of view. Samsung also have the same view.
  - LG think from UE point of view this is a like a single radio bearer but think the combination of LTE PDCP and NR RLC/MAC should be avoided.
  - Vivo think this would have an impact in UE due to the BSR reporting.
  - OPPO is not sure that the new bearer type is needed. For example there could be Xn interface impact.
  - Nokia don't see a use case and prefer to have a note in stage 3 saying that this configuration is not allowed. Ericsson think there is a use case for this. Nokia think that a network that really wants to do can just not use one leg.

Agreements:

- 1: In order to support bearer harmonization configuration in MeNB, NR PDCP capabilities (if any are defined) are duplicated in UE-EUTRA-Capability (as well as NR capabilities).

- => Discuss offline whether to add 2C support into the stage 2 description, or to add restriction into the stage 3 that 2C cannot be configured. (Offline discussion #14, ZTE)

R2-1712005 Summary of offline discussion #14: Support of 2c/2x architecture ZTE discussion Rel-15 NR\_newRAT-Core  
=> This case is marked FFS in the bearer type change table agreed from the email discussion.

R2-1711988 [DRAFT] LS on support of 2c/2x architecture ZTE LS out Rel-15 NR\_newRAT-Core To:RAN3  
=> Add sentence to say if RAN3 agree then RAN2 will update RAN2 stage 2 specs and stage 3 RRC (inter-node messages) accordingly.  
=> In RAN2 there is no consensus on whether these additional configurations should actually be supported by stage 2 specs and stage 3 RRC (inter-node messages), as some further work would anyway be needed, e.g.:  
=> Approved in R2-1712050

*Withdrawn*

R2-1711614 RLC UM support for split bearers in MR-DC NEC discussion Rel-15 NR\_newRAT-Core Withdrawn

### 10.2.2.2 Bearer type change

*Output from email discussion [99#18][NR] Bearer Type Change (Huawei)*

*This agenda item is relevant to EN-DC completion and standalone operation.*

*Maximum 1 tdoc per company.*

R2-1711090 Summary of 99#18 Bearer Type Change Huawei discussion Rel-15 NR\_newRAT-Core

R2-1711831 Summary of 99#18 Bearer Type Change Huawei discussion Rel-15 NR\_newRAT-Core  
P2

- LG think in this case the PDCP anchor is always changed.
- Ericsson think the UE doesn't see the change in the network termination point, only that the cell group changes. ZTE thinks this is related to the support of the 2C option

P4

- Think a one-step configuration should be supported if it comes for free. Huawei think this does not come for free. LG also think that does not come for free and think it cannot be a one-step procedure.
- Nokia think this also relates to lossless conversion from LTE to NR PDCP.
- IDC think using the handover is sufficient.
- Ericsson did not see any complexity in doing this changing from LTE-PDCP to NR-PDCP and make it a split bearer at that time.
- Intel think that LTE-PDCP was only for bearers that will never be split. Would prefer to stick that that agreement.
- LG think that a DU change is not considered as an SN change. Ericsson think we should clarify the SCG change term.

P9

- LG see this an optimisation and think it would be better to optimise the release procedure rather than have a re-establish followed by release. Samsung also agree with LG.
- OPPO think this is for LTE RLC and has more impact to change the legacy RLC procedure.
- Huawei think the proposal is describing current behaviours and changing RLC would be an optimisation. LG think the RLC release is up to UE implementation today. We will specify release for NR RLC but we will do it differently for LTE RLC.
- Samsung think this is a tiny modelling issue.

#### Agreements

- 1: The bearer type change between MCG split bearer and SCG split bearer is supported.
- 2: PDCP version change for DRB shall only be performed via handover procedure.

- 3: MCG bearer cannot be directly changed to other bearer type if LTE PDCP version is used for MCG bearer, i.e. the network has to use handover to change PDCP version of MCG bearer to NR PDCP and then do bearer type change from MCG bearer to other bearers.
- 4 RAN2 confirm Table 1 for the case when both MCG key and SCG key are changed.
- 5 RAN2 confirm that Table 2 correctly represents the previous agreements on L2 handling for different bearer type change upon S-KgNB security key change
- 6 For physical parameter reconfiguration of SCell or release/addition of some of SCell(s), this could be a reconfiguration procedure without PDCP/RLC impact and without MAC reset
- 7 LTE RLC is re-established first and then released for the bearer type change from MCG bearer to SCG bearer, and split bearer to SCG bearer
- 8 L2 handling for Bearer type change with and without security key change indicated in Table 4 is confirmed (apart from aspects related to offline discussion #14). The table doesn't consider the case that PDCP SN length is changed.
- 9 Capture table 4 as informative text in Annex of TS37.340;

- => Proposal 2 can be discussed offline as part of offline discussion #14
- => Proposal 7 on PSCell change can be discussed offline (Offline discussion #15, CATT)

R2-1712000 Offline discussion #15 on PSCell change CATT discussion

-

Agreements

- 1 Handling 2 is supported (RA access, MAC reset, RLC re-established, PDCP recovery (for AM DRB), No security key change) are allowed in the specification for PSCell change. Trigger conditions for PDCP recovery will be captured in RRC spec. If PDCP is in master node then MN is involved  
FFS: Handling PDCP in case of RLC-UM mode and SRBs for handling 2.
- 2 Optimisation for support of RA access without MAC reset is not required for PSCell change.

R2-1711265 Lossless conversion from LTE PDCP to NR PDCP Nokia, Nokia Shanghai Bell discussion  
Rel-15 NR\_newRAT

- Ericsson think this can be supported but we also need to consider the maximum PDU size which is different for NR and LTE.
- Intel ask if this is by reconfiguration or by handover. Nokia think this could be a reconfiguration but if that is not supported then it could be a handover.
- LG think we have a very simple procedure of release and add, and we have agreed that it is only done with handover. Vivo agree with LG and also think that re-establishment for LTE and NR PDCP is a very different procedure. Huawei have the same view as LG and Vivo.
- Samsung agree with the proposal but agree that some restriction is needed. Qualcomm also support the proposal.
- Sharp also support the proposal.
- CATT would like to understand the benefit compared to release and add. Nokia think it is a lossless change.
- OPPO support this and think release/add should be avoided as much as possible.
- Intel don't see the use case of doing this by reconfiguration, can only see the handover use case.
- LG think we already agreed for version change that we would do release and add.

Agreements

- 1 For DRBs, change from LTE PDCP to NR PDCP is done (via handover) using a release and add of the DRB (in a single message) or full configuration.

R2-1710141 Discussion on bearer type change OPPO discussion

Rel-15 NR\_newRAT-Core

R2-1710788 Remaining issues for Allowed Bearer type changes  
discussion Rel-15

Samsung R&D Institute India

R2-1710507 Bearer type change in dual connectivity Ericsson  
Core

discussion Rel-15 NR\_newRAT-Core

- R2-1711672 Consideration on PDCP version change Qualcomm Incorporated discussion Rel-15  
R2-1711816 PDCP version change for MCG DRBs with handover SHARP Corporation discussion  
Rel-15 NR\_newRAT-Core
- R2-1711781 Lossless PDCP Version Change between LTE and NR Samsung discussion Rel-  
15 NR\_newRAT-Core R2-1709028  
- moved from 10.2.2.1 to 10.2.2.2
- Withdrawn*
- R2-1711519 Consideration on PDCP version change Qualcomm Incorporated discussion Rel-15  
NR\_newRAT-Core Withdrawn

### 10.2.2.3 Other

*Any remaining stage 2 user plane aspects - detailed topics should be discussed in stage 3 user plane.*

*Note that the L2 impact of bandwidth parts as agreed by RAN1 will be discussed under separate AI 10.2.3.*

*This agenda item is relevant to EN-DC completion and SA.*

- R2-1711010 Stage 2 TP for TS 38.300v1.0.0 covering recent LCP agreements Samsung R&D Institute UK  
discussion  
=> Stage 2 can be reviewed and updated when the stage 3 details have been progressed.
- R2-1711266 Switching on split bearer at blocking of NR radio Nokia, Nokia Shanghai Bell discussion  
Rel-15 NR\_newRAT
- P2
- Ericsson ask if this if for SRB and DRB and also whether this is for normal conditions or also for SCG failure. Nokia think there is no need to restrict the cases.
  - OPPO think the procedure may not always be needed.
  - Ericsson think it could make sense that the UE initiates this after SCG failure.
  - LG think UE initiated change is a separate issue. For this proposal, it makes sense that the SN can request that the bearer is moved back to master node.
  - Huawei think that RAN3 can discuss this. We can just indicate to RAN3 that we would like to support that the SN and MN can request this path switch.
  - Lenovo think the switch is controlled by the master by setting the threshold.
  - MediaTek think there are 2 issues. One is the network signalling and one is the RRC signalling to the UE.
- => Draft LS to RAN3 to request that they work on a way for the SN and MN to request a path switch. (Offline discussion #16, Nokia). Draft LS in R2-1711940.  
=> Parameter to be signalled to RRC to control the path to be discussed in UP.
- R2-1711940 [DRAFT] LS on Switching on split bearer at blocking of NR radio Nokia LS out Rel-15  
NR\_newRAT-Core To:RAN3  
=> Revised in R2-1711970
- R2-1711970 [DRAFT] LS on Switching on split bearer at blocking of NR radio Nokia LS out Rel-15  
NR\_newRAT-Core To:RAN3  
=> Approved in R2-1712042
- R2-1711151 The support of Voice over standalone NR CMCC, Huawei discussion Rel-15 NR\_newRAT-  
Core
- R2-1711163 Support of ECN in NR Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1711164 Activation and Deactivation time of Secondary Cells Ericsson discussion Rel-  
15 NR\_newRAT-Core
- R2-1711165 [DRAFT] LS on Activation and Deactivation time of Secondary Cells Ericsson LS  
out Rel-15 NR\_newRAT-Core

- R2-1711405 Stage-2 aspects of data duplication MediaTek Inc. discussion Rel-15 NR\_newRAT-  
Core R2-1708097  
*Withdrawn*
- R2-1711240 Number of DRBs in NR EN-DC and E-UTRA Ericsson discussion Rel-15  
NR\_newRAT-Core

### 10.2.3 Impact of bandwidth parts

*To understand the consequences for RAN2 of the agreements in RAN1 on bandwidth parts (BWP), including both user plane and control plane implications.*

*This agenda item is relevant to EN-DC completion.*

- R2-1711640 Initial discussion on the impacts of BWP on RAN2 ZTE Corporation discussion Rel-  
15 NR\_newRAT-Core
- Vivo think we need to understand the minimum bandwidth supported by all UEs in order to specify the RAN procedure.
  - Nokia agree with ZTE.
  - LG agree that IDLE/INACTIVE UEs will only see the cell and not BWPs. Even for connected think we only need to consider the cell in RAN2.
  - MediaTek think the initial active BWP can be considered as the default BWP. Don't think it can be modelled as SCell.
  - LG think we can reuse the existing SCell model. MediaTek ask if this means that SCell act/deact will be used for BWP management
  - Ericsson think that the idle/inactive is needed as soon as we do SA. Ericsson think that so far a connected mode UE is only informed of the BWP BW and not the carrier BW.
- P3
- LG would prefer to consider each BWP as a cell.
  - Nokia wonder why we would need more than 2 BWPs per cell. Samsung clarify that RAN1 is currently considering 4 or 8. Nokia think if we have more than 2 active BWPs then we have 2 ways to do CA and there is a chance to lose the UE. Nokia questions the need to move the UE BWP by L1 signalling. Lenovo explain that the RAN1 decision enables the UE to be dynamically moved between numerologies.
- P4
- Huawei wonder what cell defined SSB really means. Thinks we agree to do L1 reconfigure without L1 impact. MediaTek have the same understanding as Huawei.
  - Intel ask that that is the network wants to change SSB of the same cell then handover would need to be used.
  - AT+T wonder if for SCell the change of SSB in frequency could be handled by reconfiguration.
  - Ericsson consider the serving cell is a frequency and PCI and change in either one is by synchronous reconfiguration. Nokia agree with Ericsson. If either frequency or PCI changes then it is a different cell. AT+T think this is a different case to what we have considered before as all these different BWPs are tightly synchronised.
  - LG wonder about the case of changes in the SFN of the cell defining SSB.
- P7
- Samsung wonder whether the different measurement objects would have the same parameters for the other parameters of the measurement object, and whether this is efficient.
  - Vivo think one MO can have more than one SSB.
  - Qualcomm support the proposal. If the network really needs more than one SSB per serving cell to be Measured then it can choose to configure more than one MO.
  - AT+T think there is not much use case to have more than one SSB per MO. We can go with the simple option.
- P8
- Nokia think this means that we may need gaps to even measure on the serving cell. Ericsson think we have this even for LTE MTC. Intel think that if not all configured BWPs contain the SSB then gaps will need to be configured.



- Qualcomm support the proposal and think we should avoid dynamic configuration of gaps, at least in the first release.
- LG think that serving cell quality is derived from cell defining SSB.

Agreements for BWP operation in CONNECTED mode:

- 1: BWP impacts on the CONNECTED mode will be progressed by Dec 17. Impacts to IDLE mode/INACTIVE mode UEs will be discussed with SA after Dec 17.
- 2a: RRC signalling supports to configure 1 or more BWPs (both for DL BWP and UL BWP) for a serving cell (PCell, PSCell).
- 2b RRC signalling supports to configure 0, 1 or more BWPs (both for DL BWP and UL BWP) for a serving cell SCell (at least 1 DL BWP) (impact of SUL still to be discussed)
- 3 For a UE, the PCell, PSCell and each SCell has a single associated SSB in frequency (RAN1 terminology is the is the 'cell defining SSB')
- 4 Cell defining SS block can be changed by synchronous reconfiguration for PCell/PSCell and SCell release/add for the SCell.
- 5 Each SS block frequency which needs to be measured by the UE should be configured as individual measurement object (i.e. one measurement object corresponds to a single SS block frequency).
- 6 The cell defining SS block is considered as the time reference of the serving cell, and for RRM serving cell measurements based on SSB (irrespective of which BWP is activated).

=> Can be discussed after Dec 17 or in a future release whether further optimisation is needed for change of SS block location in frequency (but with no change to PCI and no change in SFN) to be changed by RRC reconfiguration of physical layer parameters with no L2 involvement.

- |            |   |                          |                |                             |
|------------|---|--------------------------|----------------|-----------------------------|
| R2-1710578 | BWP impact on RRM measurement<br>NR_newRAT-Core   | Huawei, HiSilicon        | discussion     | Rel-15                      |
|            | P2  |                          |                |                             |
|            | <ul style="list-style-type: none"> <li>- Nokia think that for CSI-RS case the UE could change the CSI-RS resources when the BWP is changed. It is difficult to have a BWP without CSI-RS and if they are there why not use them.</li> <li>- Intel think the BWP does not impact CSI-RS measurements. Intel think that more than one set of CSI-RS resources can be configured to the UE.</li> <li>- Samsung think that RAN1 is still discussing this aspect.</li> <li>- LG think the change of active BWP should be invisible to RRC and change of CS-RSI with change of active BWP is not feasible.</li> <li>- Huawei think the key thing is to understand if there can be CSI-RS outside of the BW of the active BWP. Maybe UE could measure only the part in the active BWP.</li> <li>- Ericsson think RAN1 are still deciding the relation between BWP and CSI-RS.</li> </ul> |                          |                |                             |
|            | => We will wait for more information from RAN1 regarding CSI-RS and BWPs.   |                          |                |                             |
| R2-1711404 | RLM/RLF for bandwidth part  | Samsung R&D Institute UK | discussion     |                             |
|            | <ul style="list-style-type: none"> <li>- Vivo prefer that UE monitors the current active BWP</li> <li>- Qualcomm think that this should be discussed in RAN1.</li> <li>- LG think that option 1 has a problem as sometimes there can be good cell quality but the active BWP is not good.</li> <li>- Ericsson also think that RLM should be monitored where the PDCCH is expected to be received. It should reflect PDCCH quality. Ericsson think that RAN1 defined a parameter for the RS on which RLM is monitored.</li> </ul>  |                          |                |                             |
|            | => We leave to RAN1 to concluded (From RAN2 point of view it does not matter how the IS/OOS indications are derived.)   |                          |                |                             |
|            | => RRC timers and counters related to RLM are not reset when the active BWP is changed.   |                          |                |                             |
| R2-1710217 | User plane impacts for Bandwidth Parts<br>NR_newRAT-Core  | Huawei, HiSilicon        | discussion     | Rel-15                      |
| R2-1710091 | Random Access in RRC Connected: Bandwidth Part Aspects<br>discussion  | Rel-15                   | NR_newRAT-Core | Samsung R&D Institute India |

R2-1711289	Impact of Bandwidth Parts on SPS Scheduling	Samsung R&D Institute India	discussion	
R2-1710274	Modeling Bandwidth Parts in MAC CATT	discussion	Rel-15	NR_newRAT-Core
R2-1711387	Impacts of BWP for UE in IDLE and INACTIVE	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1710092	SI Reception in RRC Connected: Bandwidth Part Aspects	Samsung R&D Institute India	discussion	Rel-15 NR_newRAT-Core
R2-1710125	Impact of bandwidth part on CA	OPPO	discussion	
R2-1710126	Timer based BWP switching	OPPO	discussion	
R2-1710216	Definition of cells for idle and connected UEs	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710218	Stage-2 TP for BWP	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710275	BWP model	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710457	Control plane impacts for Bandwidth Parts	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710592	Overall impact in RAN2 for BWP	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1710808	Impact of BWP on RRM measurement	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1710864	Basic Framework for Bandwidth Part Operation	MediaTek Inc.	discussion	NR_newRAT-Core
R2-1710866	Text Proposal for BWP Operation in 38.300	MediaTek Inc.	discussion	
R2-1710965	Discussion on bandwidth part operation	vivo	discussion	R2-1708507
R2-1711065	Cell and BWP relation in RAN2	Nokia	discussion	Rel-15 NR_newRAT-Core
R2-1711187	Framework to support bandwidth part in NR	Samsung	discussion	Rel-15
R2-1711188	Signaling to support bandwidth part	Samsung	discussion	Rel-15
R2-1711189	Activation/deactivation of bandwidth part	Samsung	discussion	Rel-15
R2-1711190	RRM measurement to support bandwidth parts in NR	Samsung	discussion	Rel-15
R2-1711191	Draft LS to RAN1 about BWP activation/deactivation	Samsung	LS out	Rel-15
R2-1711364	Considerations on CC and BWP in NR	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1711388	RRC Procedures for BWP Configuration	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1711595	The Impact of Bandwidth Part on RAN2: Overview and Issues	discussion	Samsung Electronics	
R2-1711607	Scenarios of Measurement Gap Considering Bandwidth Part	discussion	Samsung Electronics	
R2-1711822	On Bandwidth Parts and Multiple SSBs	Ericsson GmbH, Eurolab	discussion	Rel-15 NR_newRAT-Core

*Withdrawn*

R2-1710867	Text Proposal for BWP Operation in 38.300	MediaTek Inc.	discussion	Withdrawn
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## 10.2.4 MN/SN measurement coordination

*As agreed at RAN2#99, the need for any measurement coordination between MN and SN will be discussed again after we have receive more information from RAN4.*

*Further detail discussion of the measurement object parameters that can be configured differently without affecting whether the 2 measurement objects will count as 1 or 2 measurement layers, please use stage 3 agenda item 10.4.1.4.3.*

*This agenda item is relevant to EN-DC completion.*

Maximum 1 tdoc per company

- R2-1711753 Measurement Capability Coordination for EN-DC NTT DOCOMO INC. discussion Rel-15
- P2
- Huawei think that coordination is necessary based on the agreement that the network is responsible to ensure the configurations are consistent. Also the total number of measurements supported by a UE will have some limitation on the network.
  - CATT have similar view to Huawei.
  - Samsung think that some exchange is needed for the number of measurements that can be configured by each mode. Other parts can be handled by O&M.
  - Intel thought that it could be left to RAN3 to decide whether to do anything over X2.
  - Qualcomm think it is ok if there is no standardised coordination, but have a problem solving the issue in the UE.
  - OPPO have similar view as Qualcomm, network should solve by X2, OAM but not leave the issue to the UE.
  - Vivo think that configuring too many measurements can lead to reconfigure failure.
  - DOCOMO think if we leave to RAN3, we think it will not work in real life in an inter-vendor environment.
  - Nokia think we had a previous agreement that at least the total number of measurements needs to be coordinated and the FFS was on other parameters.
  - Ericsson think it should be in inter-node RRC signalling.
  - DOCOMO think another option for RAN4 is to define a min number of measurements equal to the sum of LTE and NR measurements.
- => Offline discussion to see how to conclude on P2 onwards (Offline discussion #17, DOCOMO)

Agreements

- 1: Working assumption is confirmed (UE receives independent measurement configuration from MN and SN. UE does not do any manipulation of parameters in order to make the measurements configurations consistent (i.e. network is responsible to ensure they are consistent if it wants to ensure these are considered as a single measurement layer)

- R2-1702045 (Should be R2-1712045) Report of offline discussion #17 on Measurement Capabilities Coordinations DOCOMO

Agreements

- 1 There will be a signalling to coordinate the number of frequency layer to be used in MN and SN.
- 2 The MN indicates the number of frequency layers that can be used in the SN
- 3: Re-negotiation (SN signalling to MN for the purpose to ask for more number of frequency layer) is not supported (at least in Rel-15).

=> Parameter can be included by the inter-node message email discussion

- R2-1711092 Measurement coordination for LTE-NR DCHuawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core
- R2-1710236 Measurement Gap Configuration in MR-DC OPPO discussion R2-1707759
- R2-1710355 Coordination of Parameters for Measurements Report Trigger Fujitsu discussion Rel-15  
NR\_newRAT-Core
- R2-1710374 Considerations for the MN and the SN to configure measurement objects consistently on the same carrier Spreadtrum Communications discussion Rel-15 R2-1707971
- R2-1710811 NR measurement object configuration in SN LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1708900
- R2-1710929 Discussion on measurement gap vivo discussion Rel-15 NR\_newRAT-Core R2-1708421

## 10.2.5 MN/SN procedures for EN-DC

Output from email discussion [99#49][NR] MN/SN procedures (ZTE)

Details of the content of inter node RRC messages should be progressed in stage 3 AI 10.4.1.9.

This agenda item is relevant to EN-DC completion.

Maximum 1 tdoc per company

R2-1711527 Summary of email discussion [99#49] on MN/SN procedures ZTE Corporation  
discussion Rel-15

Agreements  
1: SRB3 may only be used in scenarios with "no MN involvement" (it cannot be used to send a SN RRC Reconfiguration message in the "SN initiated SN modification with MN involvement" procedure).  
2: Add a reference to "measurement results for SN addition/change, UE capability coordination related parameters, DRBs/SRBs configuration" in the Stage 2 description of the MN->SN container (Further details to be discussed in Stage 3)  
3: Describe the message flow for Inter-Master Node handover with MN initiated Secondary Node change in TS 37.340. (Can be discussed offline how to capture this).

=> TP capturing above agreements in R2-1711942 (Offline discussion #18, ZTE)

R2-1711942 TP to capture agreements from R2-1711527 ZTE pCR Rel-15 37.340 NR\_newRAT-Core

=> Agreed

R2-1711960 Draft LS on inter-MN handover with SN change ZTE

=> Change " description of this case " to " description of this case and other similar cases"

=> Approved in R2-1712025

R2-1710329 Consideration on the Remaining issues of EN-DC in TS 37.340 ZTE Corporation  
discussion Rel-15 NR\_newRAT-Core

- Samsung think that nested procedures could be avoided if the SN was allowed to refresh security in its own. Huawei think it is difficult to let the SN be responsible for this key derivation. Nokia also wonder if SA3 would have to be involved.
- ZTE was proposing to avoid such nested procedures and Samsung are proposing a way to avoid the proposal.

Agreements  
1: In the MN handover the target MN decides whether to keep/ change/ release the SCG.  
2: In EN-DC, the RACH-less access to t-SN is not supported in SN Change procedure at least in R15.  
3: In EN-DC, only the MN can trigger the UE to apply the new configuration in a SN Change procedure.  
4: The source MN should include the SCG configuration in the HandoverPreparationInformation.

=> Discuss P1 and P2 offline to try to conclude (Offline discussion #19, ZTE)

R2-1712018 Summary of Offline discussion #19 ZTE

Agreements  
1: During the MN initiated SN Modification procedure, SgNB shall not initiate a SCG change procedure in Step 2, at least in R15 and the corresponding FFS can be removed.  
2: For the case of a SN initiated SN Modification procedure colliding with a MN initiated SN Modification procedure, the solution in MR-DC could reuse the one in LTE DC, i.e. specifying

in Stage 3 that the SN initiated SN Modification procedure is regarded as failed while the MN initiated SN Modification procedure continues . The corresponding FFS can be removed.

R2-1711772 RB related parameters transfer between MN and SN      NTT DOCOMO INC.      discussion  
Rel-15 NR\_newRAT-Core

P2

- Samsung think that DRB ID, DRB type and EPS bearer ID.
- => Content of inter-node messages will be discussed at stage 3 level, and later stage 2 can be updated accordingly is required.

R2-1711096 Support SCG capability handling via SCG SRB      Huawei, HiSilicon      discussion      Rel-15 NR\_newRAT-Core      R2-1709940

P2

- Samsung think this is the simple approach but as we have the request to reduce the capabilities, it is not clear that the master will always provide what is required by the SN (all bands, etc).
- Qualcomm think that even before the SN is added the MN needs to know all the correct UE capability.
- DOCOMO think X2 can exchange the band information and so the master node should have knowledge of the operating bands of the SN and hence can know what to request.
- Huawei think that the MN must know the bands that the SN can support and hence knows what to request from the UE.
- Samsung think that the MN might not consider all the SN bands and some might only be added by the SN. If the SN requires more information it would be simpler to go direct to the UE.
- ZTE support the view that it should be possible for the SN to request for more information but open whether to go via the master or use SRB3. CATT think that SN should be able to trigger the request.
- Samsung think that a trigger from SN to MN is complex as it must request exactly what is missing. Nokia wonder how the SN could request capability that are specific to NR, would this be requested transparently in some way. Also think it would be good for anything requested direct by SN to be stored in the MME. Huawei think the MN request would not have to be transparent to the MN.
- Intel see it useful for SN to request UE capability - it could also reduce the capability size transferred on LTE and then SN can request more.

**Agreements**

1: In LTE-NR DC, the UE capability (including NR capability) of the UE shall be transmitted from master node to the secondary node.

**FFS:**

Do we specify that SN can request additional NR capabilities from the UE?

If yes, then is the request sent over SRB3 or is it always via MN?

Should it be possible that the additional requested capability is stored in the MME?

=> Offline discussion to try to resolve the FFS points (Offline discussion #20, Nokia)

- Update from offline: Nothing extra is needed for EN-DC

=> For EN-DC in Dec 17 we will not define any extra mechanism for the SN to request more capabilities (either on SRB3 to via the MN)

R2-1711381 SCG change related remaining issues in MRDC      Samsung R&D Institute UK      discussion

- Intel agree that messages buffered in SRB3 should be discarded and not sent to new SN. But this proposal seems to be a different case of messages send via MN.
- Samsung gives example of measurement reports sent via MN RRC. Intel think that in UE L2 the messages are MN messages
- CATT agree with the Intel comment for DL but thinks the issue is for DL.
- Huawei think it is difficult for MN to know if the measurement report comes from the old SN measurement configuration or the new SN measurement configuration. But will be a short period and MN could discard for this short period.

- Samsung confirm it is only the UL case that is considered. MN can simply use the RRC Connection Reconfiguration Complete to know the measurements change from old and new SN.
- => Noted

- R2-1710508 Discussion on the SCG change procedure Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1710856 Clarification for MN involvement during intra-SN PSCell change Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT
- R2-1711478 Further discussion on MN-SN procedures OPPO discussion

## 10.2.6 EN-DC - security aspects)

Any remaining stage 2 aspects relating to security for EN-DC.

This agenda item is relevant to EN-DC completion.

- R2-1711095 S-KeNB related issues for LTE-NR interworking Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- P5
- Samsung think there will always be an update to security in case the SN initiates SN change.
  - Huawei think that only a change of where the PDCP anchor is changes requires a key change. So it will not always be needed. Think there are different views whether SN change means that the PDCP anchor changes.
  - Samsung think we still have the issue that SN needs to request from the master.
  - CATT thinks this also depends on the PSCell change discussion.
  - Qualcomm thinks that the master controls the counter so the proposal is reasonable.
  - => P1-4 will be discussed in the scope of email discussion #30

### Agreements

- 1: No need to specify behaviour for PDCP count wrap around in NR (network expected to take action before this happens)

Offline discussion to try to conclude the FFS point (SN requests to MN whenever a new key is required (e.g. to avoid count wrap around)) (Offline discussion #21, Samsung)

- Update from offline: Covered during online discussion of other documents.

- R2-1710621 SRB3 IP check failure handling Intel Corporation discussion Rel-15 NR\_newRAT-Core
- P1
- Vivo think we previously agreed that SRB3 IP check failure is a case of SCG failure.
  - Qualcomm tend to agree with Vivo for SRB3 case.
  - Samsung also agree with Vivo and Qualcomm.
  - Intel think the SA3 LS said that it is up to the network to decide on the action on SRB3 IP check failure. ZTE agree there is a difference in what we agreed previously and what SA3 have told us. Vivo want to follow previous RAN2 agreement and not follow SA3.
  - Qualcomm think discarding any RRC message has a consequence and hence SCG failure is better.
  - LG think that SRB3 IP check failure can result in SCG failure.
  - Intel think if we go this way we still comply with SA3 bit go beyond their requirements.

### Agreements

- 1 IP check failure on SRB3 will trigger SCG failure procedure (same behaviour as for SCG failure triggered by other causes).
- 2 New cause value in SCG failure message to inform MN of the IP check failure in SRB3.

- R2-1711352 Consequences of handover without key change on SRB PDCP Ericsson discussion Rel-15 NR\_newRAT-Core

Agreements 1 PDCP recovery does not apply to SRBs
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R2-1710326	Remaining issues of Security aspects NR_newRAT-Core	ZTE Corporation	discussion	Rel-15
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Agreements 1 - Follow LTE principles for the SN requested counter check procedure.
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R2-1710328	Draft LS to SA3 on SCG SRB integrity check failure Rel-15 NR_newRAT-Core	ZTE Corporation	discussion	Withdrawn
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R2-1711094	UP integrity protection check failure handling in LTE-NR DC discussion Rel-15 NR_newRAT-Core	Huawei, HiSilicon		
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R2-1711520	Usage of data integrity protection for DRB NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-15
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- NEC understand that the security problem is more for the case of bigger data. Qualcomm understand that the use cases could be industrial control signalling which would typically be small data.
- MediaTek have the same understanding as Qualcomm but wonder how to capture this.
- Huawei think that the DRB IP is a core network decision and hence may not be possible for RAN to decide. LG agree with Huawei and also wonder what is the RAN2 spec impact.
- Intel also support the proposal but also understand it is difficult to capture. The impact is clear in the AS and so we should raise this issue.
- Qualcomm think that clearly this has RAN impact. Agree it is on request of CN but doesn't mean it can be activated for all services.

=> Draft LS to SA3 and SA2 to inform them of the concern that has been identified and that it could be addressed by limiting DRB IP to lower rate services. Inform them that the RAN plenary guidance was to complete the hardware impacting parts of L2 by Dec 17. Draft LS in R2-1712013 (Offline discussion #47, Qualcomm)

R2-1712013	[DRAFT] LS on usage of user plane integrity protection for DRB Rel-15 NR_newRAT-Core	Qualcomm	LS out	Rel-15
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=> Approved in R2-1712051

R2-1711622	draft LS on AS security algorithms for EN-DC capable eNB Rel-15	Qualcomm Europe Inc.(Italy)	other	
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R2-1711794	Draft LS to SA3 on SCG SRB integrity check failure Rel-15 NR_newRAT-Core	ZTE Corporation	discussion	
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*Withdrawn*

R2-1711548	draft LS on AS security algorithms for EN-DC capable eNB Rel-15	Qualcomm Incorporated	discussion	Withdrawn
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## 10.2.7 EN-DC - other aspects

*Any remaining stage 2 aspects. Contributions should include a TP to show how the stage 2 specification would be impacted (if no stage 2 spec impact then the contribution should be submitted to an appropriate stage 3 AI)*

*This agenda item is relevant to EN-DC completion.*

*Single UL transmission*

R2-1710608	Support of single TX UL	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
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P1

- Lenovo ask if the first proposal is same as legacy LTE. Intel explain this does exist in LTE but it now has to be signalling for this case as well. Ericsson have the same understand as Intel regarding this parameter.
- LG wonder how UE knows there is no scheduling on NR if there is no signalling. Ericsson think in NR there can be no TDM pattern and the UE just follows the UL grants from the network so it is achieved by network implementation.
- AT+T ask if there is a need for the UE to know specifically how the grants are going to be provided.
- Vodafone think this is already agreed within RAN1.
- ZTE think it is not fully concluded in RAN1.
- Nokia think that even in LTE it could be restricted by scheduling with nothing signalling.
- Intel think RAN1 agreed both approaches, one with signalling in LTE and one with no signalling on either NR or LTE.

P2

- Huawei think that RAN2 needs to discuss the TDM pattern between MN and SN
- AT+T think RAN1 did communicate to RAN1 regarding the need for TDM pattern between MN and SN.
- DOCOMO think this will be addressed in RAN3 and there are no impacts into RAN2.

P4

- Vodafone think that within a BC then RAN4 needs to identify the channel combinations that are problematic. We can't do anything in RAN2 until RAN4 have done their work.
- Intel understand that RAN plenary agreement was that RAN2 should work on this capability signalling to be completed by Dec.

Summary from offline:

- Intel explain the concern for one bit per BC is the need to signal additional BC is the capability is different from the fallback BC and how to indicate the channel allocations. Suggest that we might be able to agree 1 bit per difficult case (BC or channel allocation)

Agreements:

- 1 For timing information provided to the UE, RAN2 will follow the RAN1 agreements (RAN2 understanding is that some timing information based on TDD UL/DL configuration may be provided in LTE, and no RRC signaling to be added in NR)
- 2 RAN2 will define capability signalling per problematic case (as defined in RAN4) to indicate whether the UE support 2 simultaneous UL transmissions for the problematic case. FFS how this is structured in RAN2 (e.g. per UE bitmap or per BC bits, etc)  
(If RAN4 conclude that there are no problematic cases then these capabilities will not be introduced)

=> Leave RAN3 to work on the coordination of TDM pattern between SN and MN.

=> Discussion will occur in one WG next meeting (RAN2 and RAN3 chairs will coordinate where this discussion occurs )

**[99bis#15][NR] Capability of signalling for 1 tx (Nokia)**

Discuss options for capability signalling for 1 tx. Can consider the agreements made in RAN4 during this week. Aim to produce stage 3 text for the option(s) for which there is support so conclusion can be made at the next meeting.

Intended outcome: Report and text proposal

Deadline: Thursday 2017-11-09

R2-1711003 Further discussion on supporting 1Tx UE in EN-DC discussion Rel-15 NR\_newRAT-Core Nokia, Nokia Shanghai Bell

*moved from 10.2.5 to 10.2.7*

- Nokia request comments to consider this issues and how to resolve them for next meeting.
- => Noted

R2-1710349 Single UL transmssion in NSA and SA NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

*moved from 10.4.1.3.4 to 10.2.7*



- R2-1711018 LTE-NR Coexistence Sony discussion Rel-15 NR\_newRAT-Core
- R2-1711148 Capability signaling for single UL transmission vivo discussion Rel-15 NR\_newRAT-Core
- R2-1711354 NSA Single Tx UE capabilities T-Mobile USA Inc. discussion Rel-15 NR\_newRAT-Core
- R2-1711663 Performance Evaluation of LTE NR DC Dual UL / Single UL and UE Capability Apple GmbH agenda
- R2-1711679 UE capability indication for single UL transmission of LTE-NR DC Apple Inc., Oppo, ZTE discussion Rel-15 NR\_newRAT-Core
- R2-1711777 RAN2 impact from single uplink EN-DC Samsung Electronics GmbH discussion
- R2-1711792 Considerations on single UL/ dual UL transmission for LTE-NR China Unicom discussion  
*moved from 10.4.3.2 to 10.2.7*
- R2-1710248 Discussion on 1Tx/2Tx UE Capability for EN-DC OPPO discussion  
*moved from 10.4.3.4 to 10.2.7*
- R2-1711531 Single TX UE operation Ericsson discussion Rel-15  
*moved from 10.2.2.3 to 10.2.7*
- R2-1711677 Indication of UE Capability to Manage MSD Using In-Device Techniques AT&T discussion  
*moved from 10.4.3.2 to 10.2.7*  
=> Revised in R2-1711941
- R2-1711941 Indication of UE Capability to Manage MSD Using In-Device Techniques AT&T discussion

SUL

- R2-1711808 Connected mode aspects of supplementary uplink frequency Samsung Electronics discussion Rel-15 NR\_newRAT-Core  
*moved from 10.2.19 to 10.2.7*
- Huawei think that SUL doesn't need to use CA framework. It can be multiple carriers belonging to the same cell. The SUL and normal UL belong to one single cell.
  - Nokia think it is simple to use CA but also need to consider the BWP aspects.
  - CMCC would like to treat this as a supplementary UL to a single cell. CMCC thinks the structure doesn't work in case of one NR DL and one SUL UL
  - Intel understand that the UL can choose between SUL and normal UL but in the CA framework then both SUL and normal UL would be configured.
  - ZTE agree with Intel that it is different from the CA case. For SA we want to be able to do initial access from the SUL.
  - MediaTek think this is a new additional UL for the same cell. LG think this could be modelled as BWP or as CA.
  - Ericsson wonder if the UE ever needs to be configured with more than one UL ARFCN. It is just that the one DL can be associated with either the normal UL or the SUL. For SA there would be some difference as the RACH could be on either UL based on some measurement. Reconfiguration would be sync reconfiguration for PCell or release/add for SCell.
  - Qualcomm think the Ericsson approach is interesting. This would be ok for the UL link budget issue. But for capacity improvement then both may need to be configured.
  - Huawei think that RAN1 is discussing options where both ULs are configured and other methods are used for switching. Not yet clear what will be supported in RAN1. Intel think at least SRS may still be transmitted on the UL carrier paired with the DL carrier for purposes of MIMO signalling.

Agreements for SUL operation in connected mode:

- 1 When SUL is configured there are 2 ULs configured for one DL of the same cell. (FFS how much configuration is provided for the 2 ULs)
- 2 At any point in time, each serving cell has at most one PUSCH for transmission

Options for further discussion on RRC signalling to configure SUL

- |   |  |
|---|--|
| 1 | RRC configured 2 ULs (one if a full UL configuration and 2nd is just SRS configuration). RRC reconfiguration to provide a full UL configuration for a different carrier is used to switch UL data between 2 different ULs. |
| 2 | RRC configures 2 UL. Signalling (e.g. DCI or MAC CE) is defined to enable UE to switch between the 2 different UL configurations, or 2 use both ULs  |

=> Offline to progress the FFS and to try to conclude between the 2 options. Can consider any RAN1 progress made during this week. (Offline discussion #22, Huawei)

Comeback session on Wednesday:

Clarification of agreements

- |   |  |
|---|--|
| 1 | In any slot, one PUSCH is used for transmission for a single serving cell (i.e. associated to a single DL). This excludes simultaneous transmission on 2 PUSCH within a single slot but does not restrict switching between the two PUSCH based on L1 /MAC/RRC signalling options. |
| 2 | RAN2 consider that it is up to RAN1 to decide where PUCCH is transmitted   |
| 3 | Option 2 is clarified to " RRC configures 2 UL. Signalling (e.g. DCI or MAC CE) is defined to enable UE to switch between the 2 different UL configurations, to use both ULs but not schedule them simultaneously based on agreement 1 above"                                      |
| 4 | Final decision to use MAC CE signalling would be a RAN2 decision.  |
| 5 | Final decision to use L1 signalling would be a RAN1 decision.  |
| 6 | There is no RAN2 motivation to adopt DCI signalling.   |

- R2-1712044 [DRAFT] Summary of offline#22 on SUL operation Huawei  
=> Include RRC parameters as per RAN1's spreadsheet to enable the RAN1 decisions (and can be discussed in the scope of the RAN1 parameters email discussion)  
=> UE capability aspects can be discussed in the email discussion of UE capability parameters
- R2-1711824 Considerations on support of supplementary uplink frequency CMCC discussion Rel-15 NR\_newRAT-Core R2-1711809
- R2-1710899 Discussion on SUL carrier ZTE Corporation discussion Rel-15 NR\_newRAT-Core  
=> Revised in R2-1711841
- R2-1711841 Discussion on SUL carrier ZTE, Sanechipsdiscussion Rel-15 NR\_newRAT-Core
- R2-1711632 PUCCH and PUSCH on SUL Samsung discussion NR\_newRAT-Core  
*moved from 10.2.19 to 10.2.7*
- R2-1711002 Differentiating SUO, SUL and ULS Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core  
*moved from 10.2.5 to 10.2.7*

Other

- R2-1710858 Handling for inter-SN change during inter-MN HO Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
=> Issue of inter-SN change during inter-MN HO will be handled in RAN3 stage 3  
=> Draft LS to RAN3 to inform them of our stage 2 decisions and inform them that they will have to handle this aspect in stage 3. (To be included as part of offline discussion #18, ZTE). Draft LS in R2-1711960.
- R2-1710857 SN modification during intra-MN HO Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
- ZTE think this was skipped as it was obvious but it can be added.  
=> Add the scenario intra-MN HO involving SCG change to the TS 37.340.
- R2-1711666 Support of full configuration per CG HTC Corporation, MediaTek Inc. discussion R2-1709407  
- Ericsson wonders what happens when LTE does a full configuration,. Is SCG released?

- Intel think it will want to support source and target SN are of different releases then this is needed.
  - Ericsson think we could stick to LTE principles for full configuration. Ericsson wonder if release and add is the same as full configuration, if new SN doesn't understand the old configuration. Samsung think in LTE this was not possible in a single message but maybe it will be in NR.
  - Ericsson think full configuration of the whole configuration can also be performed. Nokia think that the MN would not know. Ericsson assume that the SN would have to inform the master that it didn't understand the source configuration.
- => Noted

R2-1710327	Remaining issues of inactive mode handling 15 NR_newRAT-Core	ZTE Corporation	discussion	Rel-
R2-1710330	Consideration on inter-MN handover with SN change Rel-15 NR_newRAT-Core	ZTE Corporation	discussion	
R2-1710332	Reply LS to SA2 on handling DC and INACTIVE STATE Rel-15 NR_newRAT-Core	ZTE Corporation	discussion	
R2-1710930	Report of SCell-failure of PDCP duplication Core	vivo	discussion	Rel-15 NR_newRAT-
R2-1711004	Considerations on fast access inter-site small cells in NR discussion Rel-15 NR_newRAT-Core	Nokia, Nokia Shanghai Bell		R2-1707831
R2-1711091	Clarification on duplication SRB in EN-DC NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1711093	Secondary RAT data volume report NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1711529	Split SRB: HO command duplication Core	Ericsson	discussion	Rel-15 NR_newRAT-
R2-1711680	ANR for NR 1709128	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-
R2-1711701	Power management by cross-RAT signaling in NSA configuration discussion Rel-15 NR_newRAT-Core	Qualcomm Incorporated		R2-1709114
R2-1711756	Consideration on duplication on SRB for CA case Core R2-1707888	CATT	discussion	Rel-15 NR_newRAT-
R2-1710277	Release of SCG SCell and PSCell change <i>moved from 10.2.18 to 10.2.7</i>	CATT	discussion	Rel-15 NR_newRAT-Core

## 10.2.8 Mobility mechanisms - SCG change for EN-DC

*Any remaining stage 2 aspects of SCG change for EN-DC (include anything common to SCG change and HO). Contributions should include a TP to show how the stage 2 specification would be impacted (if no stage 2 spec impact then the contribution should be submitted to an appropriate stage 3 AI)*

*This agenda item is relevant to EN-DC completion.*

R2-1710293	Discussion on SCG Change	CATT	discussion	Rel-15 NR_newRAT-Core
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## 10.2.9 Mobility mechanisms - basic handover

*Any remaining stage 2 aspects of basic handover (and not common to SCG change for EN-DC). Contributions should include a TP to show how the stage 2 specification would be impacted (if no stage 2 spec impact then the contribution should be submitted to an appropriate stage 3 AI)*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

R2-1710262	Further discussion on information for handover 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1710430	Discussion on the support of MBB and RACH-less in NR discussion Rel-15	ZTE Corporation, Sane Chips		
R2-1710869	TP on Basic HO Considering the FFS Issues	MediaTek Inc.	discussion	
R2-1710932	Remaining issues for baseline handover procedure NR_newRAT-Core	vivo	discussion	Rel-15
R2-1711260	Data Forwarding in intra-system Handover	Samsung R&D Institute India	discussion	
R2-1711681	Basic handover procedure considering beam 15 NR_newRAT-Core	LG Electronics Inc.	discussion	Rel-
R2-1711712	Open Issues for Basic Handover Procedure 15 NR_newRAT-Core	NTT DOCOMO INC.	discussion	Rel-
R2-1711761	Information carried from source node to target node during handover preparation phase discussion NR_newRAT-Core			ITRI

*Withdrawn*

R2-1710379	Text Proposal for Stage 2 on Mobility in RRC_CONNECTED discussion Rel-15	Withdrawn	Spreadtrum Communications	
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## 10.2.10 Mobility mechanisms - other

*Note decisions at RAN2#97bis to progress the basic HO mechanism and only when stable to discuss conditional handover and potential optimisations to target close to 0ms or 0ms interruption.*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710169	Ping Pong Issues for Conditional Handover	TCL	discussion	NR_newRAT-Core
R2-1710264	3 Types of HO in NR R2-1708879	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710265	Further discussion on Conditional HO NR_newRAT-Core R2-1708886	Huawei, HiSilicon	discussion	Rel-15
R2-1710266	DC based NR scheme for 0ms interruption handover Rel-15 NR_newRAT-Core R2-1708877	Huawei, HiSilicon	discussion	
R2-1710267	Security key change without L2 reset NR_newRAT-Core R2-1708878	Huawei, HiSilicon	discussion	Rel-15
R2-1710268	DC for intra-frequency mobility in NR NR_newRAT-Core R2-1708880	Huawei, HiSilicon	discussion	Rel-15
R2-1710269	Requirement of RACH procedure for mobility 15 NR_newRAT-Core R2-1708881	Huawei, HiSilicon	discussion	Rel-
R2-1710270	Mobility enhancements for PCell change NR_newRAT-Core R2-1708882	Huawei, HiSilicon	discussion	Rel-15
R2-1710271	Potential Advantages of multi-connectivity with multiple MAC entities within an NR cell Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core R2-1708884			
R2-1710272	Inter MN handover without SN change NR_newRAT-Core R2-1708885	Huawei, HiSilicon	discussion	Rel-15
R2-1710273	Allocation of appropriate RACH resources for handover Rel-15 NR_newRAT-Core R2-1708883	Huawei, HiSilicon	discussion	
R2-1710434	Targeting a Lossless handover with 0ms interruption discussion Rel-15	ZTE Corporation, Sane Chips		
R2-1710435	Discussion on single connected handover	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1710543	Automatic Neighbour Relation in NR 1708208	Huawei, HiSilicon	discussion	Rel-15 R2-

R2-1710590	HO optimization for Rel15 Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1710669	Conditional Reconfiguration for NR Core R2-1708736	InterDigital discussion	Rel-15	NR_newRAT-Core
R2-1710700	Mobility enhancements for NR SA Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1710701	Mobility enhancements for NR NSA Core	Samsung discussion	Rel-15	NR_newRAT-Core
R2-1710713	Discussion on feasibility of DC-based mobility enhancement Rel-15 NR_newRAT-Core		Samsung	discussion
R2-1710849	Enhancing Handover Failure Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1710850	Conditional Handover Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1710851	On Reliability, overhead and controllability aspects of Conditional Handover discussion Rel-15 NR_newRAT-Core			Ericsson
R2-1710871	Mobility Enhancement for '0ms Interruption' HO Core R2-1708002	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710872	One or Multiple NR-Cells per MAC Entity R2-1708003	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710873	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710874	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710875	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710876	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710877	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710878	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710879	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710880	One or Multiple NR-Cells per MAC Entity R2-1708003 Withdrawn	MediaTek Inc. discussion		NR_newRAT-Core
R2-1710892	Discussion on conditional handover in NR KT Corp.	discussion		
R2-1710977	Discussion on Conditional Handover in NRASTRI, TCL Communication Ltd.			discussion
R2-1711141	0 ms interruption support in NR R2-1708028	Ericsson discussion	Rel-15	NR_newRAT-Core
R2-1711142	RACHless HO in NR when UE is in CA or DC NR_newRAT-Core R2-1708029	Ericsson	discussion	Rel-15
R2-1711396	Handling of SRBs in connection re-establishment Rel-15 NR_newRAT-Core R2-1708460	LG Electronics Inc.	discussion	Rel-15
R2-1711406	The feasibility of intra-frequency dual connectivity in NR-NR DC discussion		Samsung R&D Institute UK	
R2-1711412	Problem of DC enhancement for 0 ms interruption time discussion		Samsung R&D Institute UK	
R2-1711413	Introduction of Conditional handover	Samsung R&D Institute UK		discussion
R2-1711416	Operational aspects of conditional handover mechanism discussion R2-1708839		Samsung R&D Institute UK	
R2-1711419	DRB Handling while RRC Connection Re-establishment in NR discussion Rel-15 NR_newRAT-Core		LG Electronics Finland	
R2-1711599	The Necessity of T312 in NR	Samsung Electronics	discussion	R2-1709602
R2-1711600	Conditional Handover: Event Design Aspects R2-1709603	Samsung Electronics	discussion	R2-1709603

R2-1711602	Beam Refinement Considering RRM Measurement based on Idle Mode RSSamsung Electronics discussion R2-1709604		
R2-1711678	Intra-Frequency DC to Enable Mobility with Close to Zero ms Interruption AT&T discussion R2-1708204		
R2-1711682	Conditional handover procedure LG Electronics Inc. discussion Rel-15 NR_newRAT-Core R2-1707134		
R2-1711720	NR RRC based Inter DU mobility Samsung Electronics discussion		

## 10.2.11 Mobility - RLM,RLF

*Any remaining stage 2 aspects of radio link monitoring procedure and criteria for declaring radio link failure, including impact of beam failure/recovery based on responses from RAN1 to questions sent from last meeting.*

*This agenda item is relevant to EN-DC completion*

*Maximum 1 tdoc per company*

R2-1710443	Way forward on RLM aspects for SCG ZTE Corporation, Sane Chips discussion Rel-15 P2		
	- Ericsson wonder if it is possible to complete this would responses from RAN1 on beam recovery, etc		
	- Lenovo think that this can be based on periodic indication until we have more input from RAN1.		
	- LG support the proposal and aperiodic indication can be added later.		
	- Intel also support the proposal. Vivo also. MediaTek also think this behaviour can be captured.		
	- DOCOMO understand that RAN4 is discussing the threshold of IS/OOS indications. Intel think we can discuss whether the different thresholds can be configured by RRC.		
	- ZTE has agreed there can be 2 thresholds but whether this is configurable has not been completed.		

### Agreements

- 1 RLF detection will be specified for NR in the RRC spec (as in LTE)
- 2 For Dec 17, RLF will be based on the periodic IS/OOS indications from L1 (i.e. this is same frame work as LTE)

R2-1711414	NR RLM and RLF procedure Samsung R&D Institute UK discussion		
R2-1710237	Discussion on NR Beam Failure and Radio Link Failure OPPO discussion		
R2-1710560	RLF for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core		
R2-1710625	RLM and RLF Intel Corporation discussion Rel-15 NR_newRAT-Core To:RAN1, RAN4		
R2-1710838	Remaining open issues of RLM and RLF in NR Ericsson discussion NR_newRAT-Core		
R2-1710881	RLM/RLF Considering Beam Failure Recovery MediaTek Inc., Qualcomm Incorporated discussion NR_newRAT-Core R2-1707998		
R2-1710919	RLM/RLF in NR vivo discussion Rel-15 NR_newRAT-Core R2-1708417		
R2-1711417	RLF considering Beam Recovery Failure LG Electronics Finland discussion Rel-15 NR_newRAT-Core		
R2-1711615	RLF declaration after beam recovery failure NEC discussion Rel-15 NR_newRAT-Core		
R2-1711676	Configuration of IS/OOS BLER Thresholds for RLM AT&T discussion		
R2-1711770	Beam recovery and RLF CATT discussion Rel-15 NR_newRAT-Core R2-1707892		

## 10.2.12 Mobility without RRC involvement

*AI is a placeholder for when RAN1 has made progress on beam management. Any RAN2 contributions should focus on the RAN2 implications as a consequence of RAN1 agreements - do not submit duplicates of RAN1 documents here.*

*This agenda item is relevant to EN-DC completion*

R2-1710561	RAN2 aspects of UL beam management NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710562	RAN2 aspects of DL beam management NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710563	Consideration on DRX with beam management 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1710564	Handling of resources for beam failure recovery 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1710565	CSI-RS configuration for beam management 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1710626	RAN2 implications for beam managements 15 NR_newRAT-Core	Intel Corporation	discussion	Rel-
R2-1710870	Beam Management and Beam Recovery in MAC Core R2-1707999	MediaTek Inc.	discussion	NR_newRAT-
R2-1710920	RACH configuration for beam recovery	vivo	discussion	Rel-15 NR_newRAT-Core
R2-1711081	Discussion on beam recovery request in NR discussion Rel-15 NR_newRAT-Core	ASUSTEK COMPUTER (SHANGHAI) R2-1709320		
R2-1711337	Beam link monitoring in NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711341	RRC configuration beam management in NR NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1711348	Beam management in C-DRX Core R2-1709223	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-
R2-1711350	Measurement reporting and beam refinement during RACH discussion Rel-15 NR_newRAT-Core	R2-1709088	Qualcomm Incorporated	
R2-1711360	Beam reporting and refinement during handover 15 NR_newRAT-Core R2-1709091	Qualcomm Incorporated	discussion	Rel-
R2-1711361	Beam recovery request R2-1709085	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1711363	Beam refinement after beam recovery or scheduling request discussion Rel-15 NR_newRAT-Core	R2-1709090	Qualcomm Incorporated	
R2-1711370	Dedicated resource configuration for beam failure recovery discussion Rel-15 NR_newRAT-Core	Lenovo, Motorola Mobility		
R2-1711382	Prioritized random access for beam failure recovery discussion Rel-15 NR_newRAT-Core	R2-1709073	Lenovo, Motorola Mobility	
R2-1711450	Beam Recovery in NR Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-
R2-1711451	Beam management Core R2-1708678	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-
R2-1711675	Inter-Cell Mobility with Limited RRC Involvement	AT&T	discussion	
R2-1711713	Aperiodic indications based on Beam Recovery	Samsung Electronics	discussion	
R2-1711719	NR details of beam recovery procedure	Samsung Electronics	discussion	
R2-1711721	NR signals for downlink beam management	Samsung Electronics	discussion	

## 10.2.13 Mobility - Inter-RAT

*Connected mode mobility between NR and E-UTRA*

*Inter-RAT NR measurements to be added to E-UTRA for purpose of EN-DC should be discussed under stage 3 AI 10.4.2.*

*Inter-RAT E-UTRA measurements to be added to NR for the purpose of inter-RAT handover from NR to -E-UTRA should be discussed under stage 3 AI 10.4.1.3.7*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710189	Inter-system and inter-RAT mobility LTE_5GCN_connect-Core	Ericsson R2-1707839	discussion	Rel-15
R2-1710566	Inter-RAT handover between LTE and NR NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710567	Message content in inter-RAT handover NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710804	Mobility between E-UTRAN and NR	Qualcomm Incorporated	discussion	R2-1709637
R2-1710837	UE context handling during inter RAT handover NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1711069	Events and measurements for handover from E-UTRA to NR discussion	Rel-15	Huawei, HiSilicon	NR_newRAT-Core
R2-1711302	Supporting Lossless Inter-RAT Handover	Samsung R&D Institute India	discussion	
R2-1711647	NR inter-RAT mobility to CSG cell	LG Electronics Inc.	discussion	Rel-15 R2-1709280

## 10.2.14 Security (non EN-DC)

*Stage 2 aspects of security for cases other than EN-DC*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1710198	Key refresh at handover in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1710254	Integrity Protection Verification Failure Handling in NR discussion	Rel-15	Nokia, Nokia Shanghai Bell		NR_newRAT
R2-1710346	Re-establishment upon integrity check failure 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15	R2-1709611
R2-1710347	Draft LS to SA3 on reestablishment upon integrity check failure discussion	Rel-15	Huawei, HiSilicon		NR_newRAT-Core R2-1709612
R2-1710348	Integrity protection and Counter Check Procedure for NR Rel-15 NR_newRAT-Core	Huawei, HiSilicon	discussion		R2-1709614
R2-1710542	Procedures for enabling security per bearer 15	Huawei, HiSilicon	discussion	Rel-15	
R2-1710834	Way forward with Security in RRC Inactive Core	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1710921	UE Behavior on DRB IP check failure	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1710922	Draft LS on UE Behavior on DRB IP check failure	vivo	LS out	Rel-15	NR_newRAT-Core
R2-1710923	DRB IP check failure indication	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1710924	Draft LS on DRB IP check failure indication	vivo	LS out	Rel-15	NR_newRAT-Core

## 10.2.15 Slicing

*Including signalling of slice info to RAN, impact to access control, confirmation (or otherwise) of working assumption from RAN2#99 on use of dedicated prioritises to control idle mode mobility for slicing, etc*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

*Idle mode mobility control*



R2-1710925	UE registered slices information at gNB	vivo	discussion	Rel-15 NR_newRAT-Core
R2-1710196	Slice availability	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710221	Slice Availability for Cell Reselection	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710133	TP to running CR on Dedicated Priority for Inter-Frequency Cell Reselection for Slicing	OPPO, Coolpad	discussion	R2-1710173
R2-1710163	Demerits of using Slice information for Cell selection	Lenovo Mobile Com. Technology	discussion	NR_newRAT-Core R2-1709423
R2-1710172	Discussion on Working Assumption on Dedicated Priority for Network Slicing	OPPO, Coolpad	discussion	
R2-1710173	TP to running CR on Dedicated Priority for Inter-Frequency Cell Reselection for Slicing	OPPO	discussion	
R2-1710174	Discussion on Several Issues for Network Slicing	OPPO	discussion	R2-1708038
R2-1710785	Slicing support and cell reselection	Qualcomm Incorporated	discussion	
R2-1711080	Cell selection/reselection with network slicing	vivo	discussion	Rel-15 NR_newRAT-Core
R2-1711285	Control of the frequency on which the UE camps	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core
R2-1711762	Discussion on cell reselection for network slicing	ITRI	discussion	NR_newRAT-Core

*Other*

R2-1710195	Signalling aspects of network slicing	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710197	Access control and slicing	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710219	Further Discussion on Slice Selection Information over RRC	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710220	Slice-based Unified Access Control	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710222	What is RAN part of a network slice ?	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710422	Leftover issues for NW slicing	ZTE Corporation, Sane Chips	discussion	Rel-15 NR_newRAT-Core
R2-1711020	NSSAI in MSG5	Sony	discussion	Rel-15 NR_newRAT-Core R2-1709509
R2-1711155	AMF selection based on assistance information	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1709303
R2-1711192	Connected mobility aspects to support network slicing	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1711284	Slice assistance information over RRC	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core
R2-1711779	Initial Access considering Network Slices	Samsung Electronics GmbH	discussion	R2-1709167
R2-1711791	Slice Information in RRC	Samsung Electronics GmbH	discussion	R2-1709168

## 10.2.16 QoS

*Any remaining stage 2 aspects, including QoS operation with DC.*

*Detailed topics should be discussed in stage 3 user plane*

*Note agreement at RAN2#97bis that QoS flow remapping at handover will be discussed when flow remapping not at handover has been progressed within user plane session.*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1710223	DRB Level Offloading in NR DC Core	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-
R2-1710224	Notification Control	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1710255	QoS Update	Rapporteur (Nokia)	discussion	Rel-15	NR_newRAT
R2-1710440	QoS remaining aspects for NR-NR DC	ZTE Corporation, Sane Chips	discussion	Rel-15	
R2-1710441	QoS flow to DRB mapping during handover for bearers with reflective QoS	ZTE Corporation, Sane Chips	discussion	Rel-15	
R2-1710926	Lossless HO for QoS flow and DRB offloading	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1710983	On default DRB, default QoS flow and profile	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1711234	Default DRB system impact and signalling aspects	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711235	QoS Flow Remapping in Handover and Within the Same Cell	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711238	QoS Flow Relocation in NR-DC between MN and SN	Ericsson	discussion	Rel-15	NR_newRAT-Core

*Withdrawn*

R2-1711239	QoS impact on number of DRBs supported	Ericsson	discussion	Rel-15	NR_newRAT-Core
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## 10.2.17 Positioning

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1711047	Text Proposal for Clause 4 of TS 38.305	Qualcomm Incorporated	discussion		
R2-1711048	Text Proposal for Clause 5 of TS 38.305	Qualcomm Incorporated	discussion		
R2-1711049	Text Proposal for Clause 6 of TS 38.305	Qualcomm Incorporated	discussion		
R2-1711051	Text Proposal for Clause 7 of TS 38.305	Qualcomm Incorporated	discussion		
R2-1711052	Text Proposal for Clause 8 of TS 38.305	Qualcomm Incorporated	discussion		
R2-1710538	Protocol impacts of positioning in NR	Huawei, HiSilicon	discussion	Rel-15	R2-1708209
R2-1710884	Discussion on NR positioning	ZTE Corporation	discussion		
R2-1711045	Text Proposal for Clause 1 to 3 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT
R2-1711357	Support of measurement gaps for location related inter-RAT measurements	Ericsson	discussion	Rel-15	
R2-1711358	Text proposal for 38.305 skeleton	Ericsson	discussion	Rel-15	
R2-1711691	Support NR positioning under dual connectivity	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core

## 10.2.18 Stage 2 corrections

*This agenda item is for corrections to the draft stage 2 TSs. 'Corrections' means improvements to the way that existing agreements are captured in the TS, or addition of existing agreements that have been omitted (new agreements should not be proposed). In addition, such corrections should first be communicated to the specification rapporteur for possible inclusion in a rapporteur's update, and only submitted here if you conclude a separate contribution should be useful.*

*This agenda item is relevant to EN-DC completion.*

- R2-1710074 Text proposal for clarifications on the NR RRC states Samsung, Rapporteur (Nokia)  
discussion Rel-15 NR\_newRAT-Core  
=> Agreed
- R2-1710076 Text proposal for clarifications on NR slicing Samsung discussion Rel-15  
NR\_newRAT-Core  
=> Change 'UE should be able to' to 'UE provides'  
=> Can consider offline whether to clarify in stage 2 when this information has to be provided.  
=> Offline discussion to conclude the TP (Offline discussion #24)
- R2-1712034 Text proposal for clarifications on NR slicing Samsung discussion Rel-15  
NR\_newRAT-Core  
=> Agreed
- R2-1711426 Text proposal to 38.300 on removing mini-slot HUAWEI TECHNOLOGIES Co. Ltd.  
discussion Rel-15  
=> This aspect can be corrected in stage 2 when RAN1 have finally concluded.
- R2-1711778 Text proposal for clarifications on the NR identities Samsung discussion Rel-15  
NR\_newRAT-Core  
- Samsung think that I could refer to inactive and this identity may not always be used in inactive. Nokia explain that I-RNTI is just a label in the spec.  
=> Rapporteur will correct the resume ID in the TS
- R2-1710253 URLLC Update Rapporteur (Nokia), Huawei discussion Rel-15 NR\_newRAT  
- moved from 10.2.1 to 10.2.18  
=> Agreed
- R2-1710380 Text Proposal for Stage 2 on EN-DC Spreadtrum Communications discussion Rel-15  
moved from 10.2.7 to 10.2.18  
- ZTE explain that the changes related to the measurement reports are already agreed to be added.  
=> Noted
- R2-1711659 TP on SN modification without MN involvement HTC Corporation discussion  
NR\_newRAT-Core R2-1708243  
moved from 10.2.7 to 10.2.18  
=> Revised in R2-1711929
- R2-1711929 TP on SN modification without MN involvement HTC Corporation discussion  
NR\_newRAT-Core  
=> Agreed

## 10.2.19 Other (non EN-DC)

*Other stage 2 aspects for non EN-DC*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Dual registration (to address and respond to SA2 LS)*

- R2-1710324 Consideration on the dual registration operation ZTE Corporation discussion Rel-15  
NR\_newRAT-Core

- Vivo wonder if we first need to confirm if these 2 types of UE are feasible
- Samsung think that even without any RAN coordination there can still be some coordination via OAM to enable transmissions to be coordinated.
- Lenovo saw similar issues and think everything is feasible but wonder how important these cases are. Think that SA2 would like the UE to be able to be active in both RATs at the same time but they also consider UEs that cannot do this and can only be idle in one.
- Ericsson think that it would be better to keep the UE connected via a single CN and utilise EN-DC for example. If anything we should focus on idle/active use case.
- Intel agree with ZTE that this seems feasible from a RAN spec perspective.
- Vivo gave update from coffee break discussion: Companies have diverse view. Most UE vendors think it is feasible for Dual RX, single Tx but think Dual Rx Dual Tx will have issues. But there may be some performance impact.
- Lenovo think another view from the discussion was that single tx case might still work if NAS does everything on its own.
- Intel the discussion was what was feasible in Rel-15 without any optimisation.
- => Reply to SA2 that RAN2 could not conclude whether it is feasible with the current specifications. Also indicate that we do not plan to make any optimisation for this in Rel-15.
- => Draft LS in R2-1712016 (Offline discussion #48, Intel).
- After further offline it was concluded not to send an LS.

R2-1712016 [DRAFT] [LS to SA2 on R2-1710324] Intel LS out Rel-15 NR\_newRAT-Core  
To:SA2  
=> withdrawn

R2-1710927 Impacts of dual camping UE vivo discussion Rel-15 NR\_newRAT-Core

R2-1710928 Draft reply LS on dual camping vivo LS out Rel-15 NR\_newRAT-Core

R2-1711563 Considerations of RAN impact of LTE-NR dual registration Qualcomm Incorporated discussion  
Rel-15 NR\_newRAT

R2-1710637 [Draft] Reply LS on simultaneous transmission and/or reception over EPC/E-UTRAN and  
5GC/NR Intel Corporation discussion Rel-15 NR\_newRAT-Core  
*moved from 12 to 10.2.19*

R2-1710156 Supporting Dual Registration in Access Stratum Lenovo, Motorola Mobility LS out Rel-  
15 NR\_newRAT-Core  
*moved from 10.1 to 10.2.19*

R2-1710158 Reply to LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR  
Lenovo, Motorola Mobility LS out Rel-15 NR\_newRAT-Core  
*moved from 10.1 to 10.2.19*  
=> Revised to R2-1711828

R2-1711828 [DRAFT] Reply to LS on simultaneous transmission and/or reception over EPC/E-UTRAN and  
5GC/NR Lenovo, Motorola Mobility LS out Rel-15 NR\_newRAT-Core

R2-1711776 [Draft] Reply LS on simultaneous transmission and/or reception over EPC/E-UTRAN and  
5GC/NR Samsung Electronics GmbH LS out  
*moved from 10.1 to 10.2.19*

*Other*

R2-1710345 Details on support of Rel-14 voice enhancements in SA NR Huawei, HiSilicon  
discussion Rel-15 NR\_newRAT-Core R2-1709610

R2-1710474 Support for IMS Emergency calls in NR Ericsson discussion Rel-15 NR\_newRAT-  
Core

R2-1710810 Mobility history reporting in NR LG Electronics Inc. discussion Rel-15 NR\_newRAT-  
Core R2-1708905

R2-1711070 Discussion on the support of SCG SRB for intra-NR DC Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core

R2-1711088 Bearer handling in NR-E-UTRA Dual Connectivity Samsung R&D Institute India discussion  
Rel-15 R2-1708439

R2-1711140	Discussion on SCG SRB for NR-NR DC Core	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711156	Support for IMS Emergency services in NR 15 NR_newRAT-Core	R2-1709305	LG Electronics Inc.	discussion	Rel-
R2-1711193	Numerology configuration in NR	Samsung	discussion	Rel-15	
R2-1711244	PDCP duplication for AM operation Core	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711383	AS context in RRC_IDLE R2-1708454	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1711415	RLF Procedure for NR-NR Dual connectivity	Samsung R&D Institute UK	discussion		
R2-1711549	CP latency in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711550	UP latency in NR	Ericsson	discussion	Rel-15	To:RAN3, SA2, SA3, CT1
R2-1711565	UE Voice Capability	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT
R2-1711665	Suspension to INACTIVE in NR Dual connectivity 15 NR_newRAT-Core	Samsung Electronics	discussion	Rel-	
R2-1711718	CSI-RS IDs for NR beam and RRM measurement	Samsung Electronics	discussion		
R2-1711734	Further considerations on radio network identities for NR 15 NR_newRAT-Core	Samsung	discussion	Rel-	
R2-1711793	RAN2 consideration on control plane latency enhancement discussion R2-1709170	Samsung Electronics GmbH			
R2-1711802	Further discussion on Carrier Aggregation baseline in NR Rel-15 NR_newRAT-Core R2-1709575	Samsung Electronics	discussion		
R2-1711803	RAN2 aspect on fast carrier switch NR_newRAT-Core R2-1709576	Samsung Electronics	discussion	Rel-15	
R2-1711804	Needs of Fast Carrier Switch in NR NR_newRAT-Core R2-1709577	Samsung Electronics	discussion	Rel-15	
R2-1711805	Reference waveform for uplink transmission 15 NR_newRAT-Core R2-1709579	Samsung Electronics	discussion	Rel-	

## 10.3 Stage 3 user plane

*Documents in this agenda item will be handled in the NR user plane break out session*

### 10.3.1 MAC

#### 10.3.1.1 TS

*Latest TS 38.321, rapporteur inputs, etc*

*Including output from email discussion [99#10][NR UP] – Running draft TS 38.321 – Samsung*

*Please provide input to the rapporteur for corrections. Single rapporteur TP is encouraged.*

- ☒ **[99bis#12][NR UP/MAC] – Running TS 38.321 – Samsung**  
 Agreeable TS to be endorsed next meeting  
 Deadline 3 weeks after the meeting

#### 10.3.1.2 MAC architecture

*Contributions on MAC modelling of PDCCH monitoring/TTI length.*

*Note: specific issues related to CA (e.g. RAR, SR, DRX, etc.) and duplication should be submitted under the dedicated AI. Modelling of numerology/TTI length should be submitted under LCP*

*Max 1 contribution per company – supporting TPs should be included in the contribution*

- R2-1711865 Summary of NR unit modeling InterDigital discussion  
 - Nokia thinks we also need a unit for the Bj calculation. LG thinks that we can still use TTI but when it doesn't work we can introduce some new terminology  
 => Noted

Some guidelines to keep in mind

1. Use PRACH occasion in RACH procedure
2. TTI concept can still be used when needed. Exact definition is FFS
3. Use PDCCH occasion in procedures when referring to the PDCCH monitoring.
4. Subframes to refer to a 1 ms period, with 10 subframes aligned within radio frame boundaries

- ☒ **[99bis#42][NR UP/MAC] – NR Unit replacement (Ericsson)**
- Identify proper time units to replace NR units throughout the specs
  - Outcome – TP
  - Deadline: Thursday 2017-11-09

Not treated:

- R2-1710127 MAC modelling of PDCCH monitoring occasion and TTI OPPO discussion  
 R2-1710291 Replacing NR-UNIT across MAC specification CATT discussion Rel-15 NR\_newRAT-Core  
 R2-1710655 Timing Aspects in MAC InterDigital discussion Rel-15 NR\_newRAT-Core  
 R2-1710816 MAC timing modelling Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
 R2-1710973 Time unit of MAC timers vivo discussion  
 R2-1711169 Modelling of PDCCH Monitoring considering duplex modes Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1711195 Revisiting TTI as NR-UNIT Samsung discussion Rel-15  
 R2-1711427 MAC modelling of PDCCH monitoring and TTI length Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1711763 Timing terminologies in MAC ITRI discussion NR\_newRAT-Core

### 10.3.1.3 MAC PDU format

*Contributions should focus only on critical issues/corrections related to agreed MAC PDU format*

*Contributions on RAR PDU format should be submitted under this AI (Max 1 contribution per company – supporting TPs should be included in the contribution)*

*Single TP by rapporteur on all MAC CE formats is expected for this AI. Other contributions on MAC CE format should only focus on critical issues that require discussion.*

- R2-1710112 Details on RAR MAC PDU Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
*Proposal 6: In MAC PDU for RAR, MAC subheader is not necessary for padding.*  
 => Noted

- R2-1711267 Subheader formats for MAC RAR PDU Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
 => Noted

On removal of E field

- LG thinks that if we remove E how does the UE know if there are other subheaders. Nokia explains that it would like the normal MAC sub-header, the UE continues until the T indicates there are padding.
- Nokia explains that the T bit will indicate if 0 there is a Backoff indicator or padding at the end. CATT asks how does one value indicate two different things. The T field in the first sub-header will indicate two things only RAPID or Backoff, for the rest of the sub-headers it

will indicate whether it is padding or RAPID. Lenovo thinks it can work but a little strange as we need to interpret it differently.

- Intel thinks that there is no motivation. Nokia thinks that it can be useful for larger RAPIDs and/or for future proofness.
- Samsung thinks that we use the two bit and re-interpret the values and have one reserved value. Lenovo agrees with Samsung.
- LG and Huawei think that we can keep LTE baseline.

*Where to put SI requests*

*The MAC subPDU for SI request responses should be placed before the RAR MAC subPDUs and after the BI MAC subPDU, if included.*

- CATT thinks that they should at least be grouped together. Samsung sees no motivation. QC thinks it is easier to process them if they are grouped together. Vivo also sees no motivation. Lenovo doesn't see a gain for processing as you have to parse the MAC sub-header.
- LG slightly prefers to put it at the end.

Agreements:

- 1 As in LTE, two bits (T/E) are used and 6 bits RAPID.
- 2 It is up to the network where the SI request and RARs are placed

R2-1710907 MAC CE formats for NR Samsung discussion Rel-15 NR\_newRAT-Core

- Huawei indicates that RAN1 is considering Layer 1 signaling. Samsung, Ericsson and Docomo think it was already agreed.
- Nokia thinks that we should tell RAN1 colleagues that have MAC CE, and we shouldn't use L1 signaling to activate SCell that are deactivated.

=> The proposals in this document are assumed as baseline with the assumption that some of the RAN1 dependent parameter lengths may change.

=> The TP is endorsed

R2-1711166 MAC PDU discard due to unknown MAC CEs Ericsson discussion Rel-15 NR\_newRAT-Core

=> Noted

*MAC PDU with unknown MAC CE does not result discard of the complete MAC PDU.*

- Samsung proposal is that it should be allowed on for bearer change type without MAC reset otherwise the full MAC PDU should be discarded
- QC, OPPO prefers the baseline behaviour. Vivo explains that there are two behaviours depending on the traffic type. Ericsson confirms and the proposal is to be similar to MBMS. LG thinks it is different as we are now dealing with dedicated data.
- Lenovo prefers to not discard the full PDU.
- Ericsson doesn't understand why to throw away the full PDU. LG thinks that once there is an error the UE can't trust the network anymore.
- Samsung, CATT, think that there is a use case for bearer type change without MAC reset
- We cannot do this the L field being present
- QC asks how often this happens. Ericsson thinks we have the case for bearer type change. LG for DL the network can control what is transmitted and ensure it is not discarded.

=> Assumption: The complete MAC PDU is discarded if unknown LCID is detected. Depending on bearer type change discussion we can discuss again.

Not treated

R2-1710080 Random Access in NR: RAR MAC Subheader Design Samsung R&D Institute India discussion Rel-15 NR\_newRAT-Core

R2-1710113 Discussions on MAC PDU construction Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core Withdrawn

R2-1710292 MAC RAR PDU CATT discussion Rel-15 NR\_newRAT-Core

R2-1710395	Enhancement for the Transparent MAC PDU Core	CMCC	discussion	Rel-15 NR_newRAT-Core
R2-1710962	Remaining issue for RAR	vivo	discussion	
R2-1711174	RAR Design and Contents	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711581	Padding for NR	Samsung	discussion	Rel-15 NR_newRAT-Core R2-1709584
R2-1711784	Handling of Unknown, Unforeseen and Erroneous Protocol Data	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1711028	MAC PDU format for Random Access Response	Lenovo, Motorola Mobility	discussion	Rel-15 NR_newRAT-Core
	=> moved from 10.3.1.5			

### 10.3.1.4 Random access

#### 10.3.1.4.1 Differentiation of RA parameters

*A converged solution and TP is highly encouraged provided.*

*As per RAN guidance, a short discussion will take place on the topic and depending on outcome it may be de-prioritized for RAN2#100 and postponed for June completion time frame.*

*Max 1 contribution per company – multi company contributions are encouraged. Supporting TPs should be included in the contribution*

R2-1711695	Details of prioritized random access	AsusTek, CATT, Convida, Ericsson, Huawei, Intel, Interdigital, ITRI, OPPO, Qualcomm, Vivo	discussion	Rel-15 NR_newRAT-Core
	-	Nokia asks if this conflicts with the SA assumptions. QC thinks it can co-exist. Once those categories are defined we can use them with the prioritization.		
	-	Xiaomi asks how to handle paging? QC thinks it can be part of the RRC establishment.		
	-	Mediatek thinks the most important part is how we assign priorities.		
	-	LG thinks that the BI values shouldn't be overlapping.		
	How we do we assign priorities			
	<i>Two priorities (high/low)</i>			
	-	<i>Initial access (based on access class)</i>		
	-	<i>For data (QCI)</i>		
	-	<i>For RRC establishment/re-establishment and HO (high priority)</i>		
	-	Nokia thinks there is some complexity associate with the MAC knowing the QCI and the QCI we may not be able to distinguish between some services. Sharp agrees with Nokia.		
	-	Xiaomi thinks it should be based on latency requirements.		
	-	ZTE thinks it should be based on access category and it is difficult to identify which access category should have priority.		
	-	Vivo thinks we should also cover beam recovery and SI request. Panasonic thinks it is not required for contention free cases.		
	-	Interdigital thinks that this is just a framework and any future needed prioritization		
	=>	We will resume the discussions in Janaury thinking about this framework		
	=>	Noted		

Not treated

R2-1710315	Consideration on the RACH parameters	ZTE Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1710415	On Prioritization of Random Access	PANASONIC R&D Center Germany	discussion	
R2-1710489	Differentiation of RA parameters	Lenovo, Motorola Mobility	discussion	Rel-15 NR_newRAT-Core
R2-1710657	RACH Configuration in Handover	InterDigital	discussion	Rel-15 NR_newRAT-Core R2-1708730
R2-1710961	Group the different RACH events	vivo	discussion	
R2-1711040	Categorized Events for Differentiation of backoff and power ramping parameter	Xiaomi Mobile Software	discussion	Rel-15 Beijing



- R2-1711152 Discussions on configuration of parameter differentiation for RACH CMCC discussion Rel-15 NR\_newRAT-Core
- R2-1711428 Further discussion on differentiation for SR-triggered Random Access discussion Huawei, HiSilicon Rel-15 NR\_newRAT-Core
- R2-1711634 Differentiation of Backoff parameter and/or power ramping Samsung discussion NR\_newRAT-Core

#### 10.3.1.4.2 Random access in presence of multi-beam operation

*Issues related to multi-beam operation. Focus should be on RAN2 specific aspects*

*Max 1 contribution per company – supporting TPs should be included in the contribution*

- R2-1710614 Random Access multi-beam aspects Intel Corporation discussion Rel-15 NR\_newRAT-Core

*Proposal 1: A new UL beam switching notification should be defined in NR for L1 to inform MAC layer of UL beam switching to ensure proper power ramping operation.*

- LG thinks that power ramping suspension indication is enough. Intel thinks that it could work if it is only for that purpose. Samsung thinks that we now have two counters and power suspension impacts both counters.

=> Noted

- R2-1710078 Beamformed RA: Additional Power Ramping Aspects Samsung R&D Institute India discussion Rel-15 NR\_newRAT-Core

*Proposal 1: MAC entity increments PREAMBLE\_POWER\_RAMPING\_COUNTER by 1 if UE does not change the TX beam and the SS block for PRACH retransmission.*

- Intel would like to understand if the DC we would need a separate notification. Samsung things that we would need to distinguish the behavior.
- Intel asks if we can have the a similar behavior. Lenovo indicates that RAN1 is still discussing.

=> Noted

#### **Agreements**

- MAC entity increments PREAMBLE\_POWER\_RAMPING\_COUNTER by 1 if UE does not change the TX beam and the SS block for PRACH retransmission
- A new notification, power ramping counter suspension notification, should be defined in NR for L1 to inform MAC layer of UL beam switching and SS block change for PRACH retransmission for MAC to maintain PREAMBLE\_POWER\_RAMPING\_COUNTER. FFS for DC case.

- R2-1710656 PRACH Resource Configurations for Beamforming InterDigital discussion Rel-15 NR\_newRAT-Core

*Proposal 1: If an association between SS block(s) and PRACH resource(s) and/or preamble indices is configured in RMSI, the SS block index selected based on the outcome of L1 DL Tx Beam measurements is used for the association in MAC.*

- Samsung agrees that the MAC needs to know but maybe we can leave it up to UE implementation.
- InterDigital thinks what's important is to select the preamble from the right preamble group associated to a SS block.
- Nokia thinks that we need to consider the CSI-RS association.

*Proposal 2: The SS block index selected during random access based on the outcome of L1 DL Tx Beam measurements shall be indicated to the MAC entity.*

- Lenovo thinks that some form of indication is needed. We provide the configuration or parameters needed from the MAC at the beginning of the section.
- Ericsson asks where the SS block selection is done. InterDigital thinks that it could be in either RAN1 or in RAN2. LG thinks that the PHY layer should select the SS block.

=> Noted

#### **Agreements:**

1. MAC needs to know the selected SS block (and CSI-RS if an association is agreed) in order to select from the associated PRACH resource and/or associated preamble sequences.
2. An selected SS block is provided by Layer 1 (if SS block selection is specified in RAN1). FFS if the MAC needs to do the selection [CB for CP]

- R2-1710079 Draft LS on RA preamble power ramping counter update Samsung R&D Institute India LS  
out Rel-15 NR\_newRAT-Core  
=> Add additional agreements on SS block indication  
=> The LS is revised in R2-1711855
- R2-1711855 Draft LS on RA preamble power ramping counter update Samsung R&D Institute India LS  
out R2-1710079 Rel-15 NR\_newRAT-Core  
- Ericsson thinks that there are some discussion in the CP may mean that the selection is done in the MAC. Samsung thinks we can specify in the MAC  
=> Wait for final agreement in CP session  
=> The LS is revised R2-1711869
- R2-1711869 Draft LS on RA preamble power ramping counter update Samsung R&D Institute India LS  
out R2-1711855 Rel-15 NR\_newRAT-Core  
[CBF #310]
- R2-1711176 Preamble modeling and configuration with multiple SSBs Ericsson discussion Rel-15  
15 NR\_newRAT-Core  
=> Noted
- R2-1711025 Remaining Issues on RACH Procedure Sony discussion Rel-15 NR\_newRAT-Core  
- Samsung thinks that we should leave it up to RAN1 whether they need a maximum and UL beam selection is up to UE implementation.  
=> Noted
- Not treated
- R2-1710771 Random access with beam operation Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core
- R2-1710865 Discussion on random access with multi-beam operations HTC Corporation discussion  
NR\_newRAT-Core R2-1709422
- R2-1711050 Multiple preamble transmission for contention free RACH Beijing Xiaomi Mobile Software  
discussion Rel-15
- R2-1711086 Discussion on multiple Msg1 transmissions for contention free RACH ASUSTEK  
COMPUTER (SHANGHAI) discussion Rel-15 NR\_newRAT-Core
- R2-1711608 Random Access procedure for multi-beam operation LG Electronics Inc. discussion

#### 10.3.1.4.3 Random access procedures

*Contributions on further details of random access procedures, preamble selection, power ramping for msg1 transmission (with no beam forming) RA-RNTI calculation and 4 contention resolution.*

*Stage 3 details of On-demand SI request. Details for msg3 based-SI request depend on CP discussions and may not be progressed given the prioritization of SI design in CP.*

#### RA-RNTI

- R2-1710357 RA-RNTI calculation Fujitsu discussion Rel-15 NR\_newRAT-Core  
=> Noted
- R2-1711175 RA-RNTI for NR Ericsson discussion Rel-15 NR\_newRAT-Core  
=> *Noted*
- R2-1710775 Calculation of RA-RNTI Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

=> Not treated

R2-1711609 Considerations for RA-RNTI calculation LG Electronics Inc. discussion NR\_newRAT-Core

=> Not treated

Discussion:

*Is 64 preambles enough?*

- Ericsson thinks that it depends if it per cell it is far too little but if it is per SS block it could be sufficient.
- Samsung thinks that we already told RAN1 about the need of preambles and they can design accordingly

*On including the SSB index*

- Lenovo also thinks this is good to increase instead of RAPID.
- QC, and CATT doesn't see a good justification. PRACH occasions can indicate the SSB associated.
- LG indicates that RAN1 is still discussing whether to increase the RAPID and if they don't RAN2 can consider alternate ways.
- Nokia explains that one scenario considered by RAN1 SSB index it can be associated to multiple starting time in PRACH so it may not be able to uniquely identify and it can map to multiple PRACH occasions.
- Samsung thinks that RAN1 agreed that an SSB can be identified by the preamble selected

=> At least time and frequency is used in the RA-RNTI formula

Contention resolution

R2-1710081 Random Access in NR: Contention Resolution Samsung R&D Institute India discussion Rel-15 NR\_newRAT-Core

=> Noted

R2-1710772 Contention resolution for random access Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

*Proposal 2: For random access for transition from INACTIVE to CONNECTED, contention resolution is based on UE Contention Resolution Identity MAC CE included in Msg4. Upon reception of the UE Contention Resolution Identity MAC CE in Msg4 which matches the CCCH SDU, the UE considers the contention resolution successfully completed.*

- Ericsson thinks that the only difference that the CCCH SDU may conte

=> no support to enhanced contention resolution

=> Noted

Agreements

1. As in LTE, if C-RNTI MAC CE was included in Msg3, the contention resolution is successful if one of the following conditions is met:
  - If the Random Access procedure was initiated by the MAC sublayer itself or by the RRC sublayer and the PDCCH transmission is addressed to the C-RNTI and contains an UL grant for a new transmission;
  - If the Random Access procedure was initiated by a PDCCH order and the PDCCH transmission is addressed to the C-RNTI
2. As in LTE, if C-RNTI MAC CE was not included in Msg3, the contention resolution is successful if the UE Contention Resolution Identity received in Msg4 matches the first 'X' bits of CCCH SDU transmitted in Msg3. The value of 'X' is FFS.
3. As in LTE, after transmitting Msg3, UE starts mac-ContentionResolutionTimer and restart mac-ContentionResolutionTimer at each HARQ retransmission. If mac-ContentionResolutionTimer expires, contention resolution is considered not successful.
4. For contention based random access for INACTIVE to CONNECTED transition, the same contention resolution as for idle mode is used. The assumption is that CCCH SDU contents will contain some form of ID in the resume request message.

Msg1 based SI request

R2-1710294 The impact of On Demand SI on RA procedure CATT discussion Rel-15 NR\_newRAT-Core R2-1707928

*Proposal 2: In case of simultaneous SI request and RRC connection RA triggers, it is up to UE implementation which RA procedure should be performed first.*

- Vivo thinks that an emergency call can be more important so we should stop the SI request.
- Lenovo thinks that storing the msg3 adds complexity so we should adopt second alternative, go to dedicated mode then do a SI request.
- LG thinks the RRC can handle and not trigger a RA when a RRC connection has been triggered
- Samsung points that there is another scenario, a RA is triggered while another one is ongoing.

=> Noted

R2-1711731 RA for Msg1 based SI request LG Electronics UK discussion NR\_newRAT-Core

*Proposal. RRC indicates to MAC whether the RAPID is used for SI request or not when triggering RA procedure for SI request.*

- Qualcomm thinks that the two bits in the header are sufficient to differentiate.
- LG thinks that there is no way for the UE to know whether there is a RAR following the header
- Samsung thinks that the UE can change whether it is a RAPID for the SI request or not. LG understood that the reserved RAPID are not visible to the MAC layer.
- Lenovo thinks that we agree that the MAC knows that this is a SI request
- Huawei thinks that the UE also needs to know the other RAPID that are reserved for SI request as other UEs can be performing SI request.
- Lenovo thinks that it is important that the UE has the information. Ericsson thinks that as long as it is in the SIB the UE can know, we don't need to specify the interaction.
- Nokia agrees that the information has to be available in the MAC before we do any RACH.
- Ericsson think the RACH resources are not needed as the UE wouldn't decode the RA-RNTI if it triggered other random access procedure.

=> Noted

R2-1711306 MSG4 content for on-demand SI request for SI broadcast MediaTek Inc. discussion R2-1708046

=> Noted

Agreement:

1. There is at most one Random Access procedure ongoing at any point in time in a MAC entity. It is up to UE implementation how to prioritize.
2. Stopping of the RA procedure for SI request is up to UE implementation
3. The MAC is made aware of the preamble sequences reserved for SI requests.

Not treated

R2-1710102 Msg1 based SI Request: DL TX Beam Identification Samsung R&D Institute India discussion Rel-15 NR\_newRAT-Core R2-1707681

R2-1710103 Msg1 based SI Request: PRACH Preamble Selection Samsung R&D Institute India discussion Rel-15 NR\_newRAT-Core

R2-1710776 Discussion on the procedure of MSG1-based SI request Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

R2-1711642 Grouping SI request responses in random access procedure III discussion Rel-15

Preamble selection

R2-1710773 Selection of random access preamble in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

*Proposal 1: As in LTE, preamble group selection should be based on Msg3 size and pathloss in NR.*

- Ericsson doesn't see pathloss is necessary and is something not really used in LTE and focusing on msg size is more important.
  - Vivo thinks pathloss is important as in RAR we have power control parameters. If there is no pathloss included then network would not know how to set the pathloss parameter in RAR. Ericsson thinks that the network has to have the functionality even for a single group case. Lenovo has the same understanding as Ericsson. Samsung thinks that we should follow the LTE baseline unless RAN1 has another view. CATT agrees with Samsung as RAN1 included it in the first place so RAN2 shouldn't remove it.
  - LG agrees with Ericsson and Lenovo.
  - Nokia explains that in Rel-13 the UE can chose a preamble group without considering pathloss.
  - Ericsson thinks that use case is mainly for handover case.
  - Nokia thinks that we should also allow the case where the UE is allowed to chose preamble group B without taking pathloss into account.
- => Noted

R2-1711173 Remaining Issues of Message 3 Size Indication Ericsson discussion Rel-15  
NR\_newRAT-Core  
=> Noted

**Agreements:**

1. As in LTE, preamble group selection can be based on Msg3 size and pathloss in NR.
2. The parameters numberOfRA-Preambles, sizeOfRA-PreamblesGroupA, messageSizeGroupA in LTE should be reused in NR
3. The parameters numberOfRA-Preambles, sizeOfRA-PreamblesGroupA, messageSizeGroupA are conveyed via NR SIB1.

R2-1711443 Text proposal for Random access Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Not treated

Other

R2-1710909 Triggering/initiating Random Access Procedure in NR Samsung discussion Rel-15  
NR\_newRAT-Core R2-1709005

*Proposal 8: Random access for "Transition from RRC\_INACTIVE" is triggered by MAC sublayer itself*

- Ericsson asks why. Samsung explains that it is triggered by the reception of CCCH PDU.

*Proposal 10: Random access for "Request for Other SI using message 1" is triggered by RRC sublayer.*

- Xiaomi asks whether we should include the RA triggered by beam recovery
- Intel and docomo don't see the need to specify which layer triggers as we never did it for LTE. Docomo thinks if any details are needed it should be in the MAC.
- Nokia ask what is PSCell management and STAG management. Samsung explains it was in LTE.

=> We will not specify the layer which triggered the random access in MAC

=> Add some UL data arrival, Request for other SI(s), beam recovery and for timing alignment purposes

=> This will captured by the 36.300 rapporteur

=> Noted

Not treated

R2-1710964 Stop SI request due to RRC connecition setup RACH vivo discussion R2-1708494

R2-1711707 Enhancement for mitigating contention in random access Qualcomm Incorporated discussion  
Rel-15 NR\_newRAT-Core R2-1709120

R2-1710613	Random access procedural aspects NR_newRAT-Core	Intel Corporation	discussion	Rel-15
R2-1710717	Discussion on non-contention based random access Rel-15 NR_newRAT-Core R2-1709259	Huawei, HiSilicon	discussion	
R2-1710784	Power ramping for Msg1 transmission with no beam forming discussion Rel-15 NR_newRAT-Core	Withdrawn	Huawei, HiSilicon	
R2-1710910	Triggering/initiating Random Access Procedure in NR 15 NR_newRAT-Core R2-1709005	Withdrawn	Samsung discussion	Rel-

#### 10.3.1.4.4 Other aspects related to RA

R2-1710107	Random Access Procedure for RRC INACTIVE State discussion Rel-15 NR_newRAT-Core	R2-1707685	Samsung R&D Institute India	
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*Proposal 1: Contention based random access procedure is supported in RRC INACTIVE state.*  
*Proposal 2: Contention free random access procedure is not supported in RRC INACTIVE state.*  
 - LG asks why we don't support it. Samsung thinks it is not clear how the UE gets the resource as the UE will be moving around the RAN areas and benefit is limited.  
 => Noted

Not treated

R2-1710105	Multiple Message 1 Transmissions 15 NR_newRAT-Core	Samsung R&D Institute India	discussion	Rel-
R2-1710774	RAR monitoring occasion in RAR window NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15

#### 10.3.1.5 SR

*SR configuration, mapping and transmission for CA case*

*Handling of timers and SR\_counters*

*SR cancelation and failure handling*

R2-1710817	SR procedure for NR	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
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*Proposal 1: one LCH mapping to multiple SR configurations on different cells is allowed.*  
 => Noted

#### *Discussions*

*An SR configuration consists of one or many PUCCH resource configurations and one counter and timer configuration*

- Nokia thinks that we can just refer send SR on PUCCH resources on different cells
- LG thinks that we have one PUCCH resource configuration per SR configuration. Samsung also thinks that we should stick to the original intention, one PUCCH resource per SR configuration.
- Oppo is concerned about the case that you switch BWP.

*LCH mapping to SR configuration on different BWP*

- Samsung thinks that it should be possible in case of switching but it should be only one to one mapping for an active BWP.
- Huawei also agrees.

*Discuss which option to choose for timer and counter maintenance:*

*Option 1): Commonly maintained prohibit timer and counter for the SR procedure with the prohibit timer using the minimum value of sr-ProhibitTimer and retransmission number counter using the maximum value of drs-TransMax of the SR configurations usable for the SR procedure depending on the LCHs triggered the SR.*

*Option 2): Separately maintained prohibit timer and counter for each PUCCH resource. Prohibit timer only prohibit the SR transmission of the corresponding resources and maximum retransmission number reached on any resource triggers SR failure.*

- LG prefers options 2 as the intention is to manager the resources
- Ericsson thinks that having one timer per MAC entity is the simplest solution. CATT indicates that we agreed last time to have indepent timers and we just need to discuss whether there is only one at a time.
- Huawei thinks that option 2 will minimize specification impact
- CATT thinks option 2 is preferred as the time should match the service requirements.
- Mediatek likes 2 as well.
- Lenovo asks what happens when we switch BWP. Nokia explains that at least for CA the UE starts the timer according of the resource it is using.
- Samsung thinks that we can have on timer per logical channel, when you switch BWP you can have continuance.
- LG thinks that it wouldn't make to continue with the same counter when we switch SR resource.
- CATT thinks that any time you transmit an SR all timers should be started.

*What happens when a max SR retransmission on a SR configuration*

*Option 1: a RACH is always triggered*

*Option 2: a RACH its triggered only if all pending SRs on different SR configuration fail*

- Vivo thinks that we can use another SR resource. Ericsson thinks that it invalidates the mapping
- CATT thinks that this depends on whether we have multiple ongoing SR.
- LG thinks that as long as there a SR configuration alive there is no point on triggering RACH. Qualcomm thinks that option 2 is reasonable. No point triggering a RACH if a URLLC fails.
- Lenovo thinks that the point of SR failure is to detect link failure and it makes sense to notify the network. Docomo thinks that option 1 is better. Huawei thinks that the UE should notify the network and indicate the reason.
- Lenovo thinks we have to use the RACH as we have no SR to tell the network. Convida thinks that we anyways have to tell the network.
- Qualcomm thinks that even with Option 1 RACH how does the network know that SR has failed. Ericsson thinks the network can deduct it from the BSR.
- Qualcomm thinks that the coverage for the PUCCH may be different and its not fair the release all SR resources. Ericsson thinks that the network can configure the UE with short and longer PUCCH and the UE can switch. Qualcom wants to confirm that this is indeed possible. Ericsson thinks it should be possible.
- Oppo thinks we should release only failed PUCCH resource. ERiccson thinks we should realease everything.

*LCH can be mapped to none, one, or more SR configuration per BWP (single cell)*

- Intel asks if the network configures the UE. That's the intention

R2-1711864 Summary of SR issues Samsung discussion

=> Noted

**Agreements:**

1. An SR configuration consists of a collection of sets of PUCCH resources across different BWPs and cells with the following constraints:
  - Per cell, at any given time there is at most one usable PUCCH resource per LCH
  - This corresponds to the case of one single LTE-like set of SR PUCCH resources being configured per LCH per BWP, and only one BWP being active at a time
2. Each LCH is mapped to none or one SR configuration.
3. Each SR configuration has its own SR counter and prohibit timer.
  - This counter and timer control the SR configuration i.e. SR procedures on the group of LCHs mapped to the SR configuration in question.
  - When max SR transmission counter is reached on a SR configuration, SR failure is declared and the UE triggers a RACH and releases all PUCCH resources.
  - SR counters and timers are independent across different configurations.

- 4 BWP switching and cell activation / deactivation do not interfere with the operation of the counter and timer.
- 5 The selection of which valid PUCCH resource for SR to signal SR on when the MAC entity has more than one valid PUCCH resource for SR in one 'TTI' is left to UE implementation. FFS Maximum number of SR configurations/PUCCH resource per MAC entity

- ☒ **[99bis#38][NR UP/MAC] – SR open issues (Nokia)**
- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
  - Outcome: Set of proposals to address the issues and a potential TP
  - Deadline: Thursday 2017-11-09

- => Guideline from chair
- Additional contributions should not address the open issues listed in the email discussion even if you don't agree with the proposed outcome

R2-1711179	SR failure handling for multiple pending SRs NR_newRAT-Core	Ericsson	discussion	Rel-15
	<i>Proposal 1</i>			
	<i>Upon triggering of the SR failure by a pending SR, i.e., the SR_COUNTER reaches the maximum value, the UE shall</i>			
	<i>• Only if there are no other pending SRs, release the configured SR PUCCH resources and configured UL grants and DL assignments, cancel all pending SRs, and initiate a Random Access procedure on the SpCell.</i>			
	=> Noted			
Not treated				
R2-1710108	Remaining issues on multiple SR configurations NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710341	On LCH-to-SR-configuration mapping within the multi-BWP framework Institute UK		discussion	Samsung R&D
R2-1710605	Handling multiple SR configurations NR_newRAT-Core	Intel Corporation	discussion	Rel-15
R2-1710109	SR procedure in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710110	SR failure handling in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710111	SR configuration and transmission for CA case in NR Rel-15 NR_newRAT-Core	Huawei, HiSilicon	discussion	
R2-1710128	Details of SR procedure	OPPO	discussion	R2-1707736
R2-1710129	SR configuration in CA case	OPPO	discussion	
R2-1710130	Impact of bandwidth part on SR configuration	OPPO	discussion	
R2-1710295	Further details on the SR procedure	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710296	SR configuration, mapping and transmission for CA case NR_newRAT-Core	CATT	discussion	Rel-15
R2-1710319	Consideration on the SR in NR	ZTE Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1710336	Text Proposal for TS 38.321 covering SR operation in NR discussion	Samsung R&D Institute UK		
R2-1710337	Handling absence of SR resource in NR	Samsung R&D Institute UK	discussion	
R2-1710339	Behaviour in case of multiple SR triggers and collision resolution discussion	Samsung R&D Institute UK		
R2-1710358	SR procedure with multiple SR configurations Core	Fujitsu	discussion	Rel-15 NR_newRAT-Core
R2-1710658	Multiple SR Configurations in NR	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1710824	Discussion on SR_Counter	Potevio	discussion	



R2-1710868	Discussion on details of SR procedures	HTC Corporation	discussion	NR_newRAT-Core
	R2-1709419			
R2-1710971	Discussion on the SR configurations for CA case	vivo	discussion	
R2-1710974	Discussion on the SR cancellation and failure handling	vivo	discussion	
R2-1711087	Consideration on multiple SR configurations	ASUSTEK COMPUTER (SHANGHAI)		
	discussion	Rel-15 NR_newRAT-Core	R2-1709328	
R2-1711178	Remaining issues for Scheduling Request	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711296	Scheduling Request Enhancement for Latency Reduction	Spreadtrum Communications		
	discussion			
R2-1711303	SR design supporting multiple configurations	MediaTek Inc.	discussion	
R2-1711696	SR procedures with multiple SR configurations	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1711729	Multiple SR in NR LG	Electronics UK	discussion	NR_newRAT-Core R2-1709151
R2-1711764	Discussion on SR configuration mapping	ITRI	discussion	NR_newRAT-Core
R2-1711765	Discussion on SR procedure	ITRI	discussion	NR_newRAT-Core

### 10.3.1.6 BSR

*BS size, table calculations, and format (max 1 contribution per company for this topic)*

*BSR cancellation*

R2-1710298	BSR MAC CE	CATT	discussion	Rel-15 NR_newRAT-Core
	=>	Noted		
R2-1711304	NR BSR format design	MediaTek Inc.	discussion	
	=>	Noted		
R2-1711697	A unified format for BSRs	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
	<i>BS size:</i>			
	=>	Noted		

#### *Short BSR BS size*

- *5 bits*
- *6 bits*
- Ericsson thinks no optimizations are needed and 5 BS bits can be used. Vivo thinks that we should use 6bits and optimize the header.
- Huawei, Nokia, thinks 5 bits are sufficient
- Mediatek thinks that the short BSR is not only used when you have small amount of data but it is included instead of padding. Qualcomm thinks we should have two formats for the use case.
- Oppo thinks that that we should have the same format for short and truncated BSR.
- LG thinks that 5bits are sufficient. Nokia thinks that BSR doesn't have to be too accurate so 5 bits are enough.
- Samsung is concerned that the granularity might not be enough and the network may give a UE a grant bigger than needed and the UE will have to put padding, so overhead is not saved. Ericsson thinks that it depends on how we construct the table. Samsung things that this implies that the long BSR will provide more information and would be more efficient for VoIP.
- Vivo thinks that the granularity for short BSR should be maintained. CATT thinks short BSR is only to support some specific cases and we shouldn't spend time optimizing.
- LG thinks that the UE can use the short BSR for LCG that have limited amount of data and if there is LCG with more data then we can use long BSR. Lenovo thinks that long BSR can be used even for single LCG case as it can be flexible.
- Mediatek thinks that we should have the same BS size for both.
- KT thinks that we should have 6 bits for BS size

- Lenovo thinks that the truncated BSR can be covered by the long BSR. Huawei thinks that if the padding is limited to 1 byte we use short and if we have more we can use long. Nokia agrees we can have short truncated and long truncated. Ericsson thinks that we should just use the short BSR format. Intel, LG, thinks it can be applied to both.

*Long BSR with variable length can be used also for the case where a single LCG needs to be reported*

- Ericsson ask why we don't follow LTE baseline. Huawei thinks we can maybe call it flexible BSR. LG thinks that we are already deviating from LTE baseline so we should allow this.
- Nokia asks how the UE knows and how it decides. Then the TB sizes have to be designed using the worst case scenario.
- Ericsson thinks that the number of LCG reported can correspond to the number of configured LCG
- CATT thinks one solution is to configure the UE whether it uses short BSR or the flexible BSR. Huawei thinks that it can be just based on amount of data in BS
- Lenovo asks why can't just have 5 bits BS for both formats. Huawei cares sometimes about the granularity. Ericsson thinks for high volume use cases we need a better granularity and a tradeoff for short BSR was acceptable.
- LG would like to check if there is a problem to use the long format even when only one LCG has data.
- Mediatek thinks that now this is different from LTE as BS is different.

*How to signal the variable size BSR*

*Variable-size BSR MAC CE with a bitmap indicating the reported LCGs as in Figure 3:*

- One byte bitmap for LCGs indication;
- Buffer Size of indicated-only LCG (s) in increasing LCG order.
- Intel supports CATTs proposal about the bitmap
- Ericsson thinks we should just report the configured LCGs.
- Nokia thinks the bitmap is good especially truncated.
- LG agrees for signalling overhead. Oppo also thinks that the L field can be avoided.

*Truncated BSR*

- Vivo thinks that if we allow both we would need two LCID. LG thinks that we need 4 LCID for each format.

**Agreements:**

1. For short BSR 5 bits BS is used
2. For Long BSR 8 bits BS is used.
3. Variable-size BSR MAC CE with a bitmap indicating the reported LCGs. One byte bitmap is used and fuffer Size of indicated-only LCG (s) is provided increasing LCG order. LCGs with no data in the buffer before LCP do not have to be reported.
4. As a baseline, short BSR is reported when a single LCG has data available.
5. Truncated BSR can use the short BSR or long BSR format. The truncated short BSR is used when only 2 byte of padding are available and truncated long BSR is used when more than 2 bytes of padding are available.
6. For truncated BSR the LCGs are selected based highest order of priority
7. 4 LCID(s) are used to indicate short BSR, long BSR, short truncated BSR, and long truncated BSR

R2-1710204 BSR impacts on SR trigger Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

*Proposal: When a regular BSR has been triggered by a logical channel and the UE has available UL resources allocated, if the UL resources cannot be used to transmit the data of the logical channel who triggers the BSR, the SR is triggered; Otherwise, the SR is not triggered.*

- CATT doesn't thinks this is a necessary optimization. Ericsson agrees with CATT, it is quicker to send a BSR then to trigger an SR.
  - Vivo supports this optimizations
  - LG thinks the network has full knowledge of what it needs to schedule.
- => Noted

R2-1710334 Text Proposal for TS 38.321 covering BSR triggering operation in NR Samsung R&D  
Institute UK discussion

*Proposal 1: Regular BSR is triggered following arrival of data for a LCH of higher priority than LCHs mapped to the same SR configuration which have previously contained data.*

- Ericsson thinks that if the logical channel is latency critical then it should be configured with higher priority. Lenovo agrees with Ericsson. Huawei thinks that for lower priority data periodic BSR is enough.
  - LG and QC agrees with the intention
- => Noted

☒ **[99bis#39][NR UP/MAC] – BSR open issues (Vivo)**

- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

=> Guideline from chair

- Additional contributions should not address the open issues listed in the email discussion even if you don't agree with the proposed outcome

Not treated

R2-1710320	Consideration on BSR for URLLC in NR NR_newRAT-Core	ZTE Corporation	discussion	Rel-15
R2-1710695	BSR design to support pre-processing Core R2-1708270	MediaTek Inc.	discussion	Rel-15 NR_newRAT-
R2-1710202	Design of BSR format and BS table NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710203	BSR procedure	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710205	BSR enhancement for SDAP Core R2-1707725	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-
R2-1710241	BSR enhancements with multiple numerologies	SHARP Corporation	discussion	
R2-1710256	BSR Formats Withdrawn	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1710297	Discussion on BSR cancellation 1707919	CATT	discussion	Rel-15 NR_newRAT-Core R2-
R2-1710352	Discussion on BSR format	OPPO	discussion	
R2-1710356	MAC TP for BSR	Fujitsu	discussion	Rel-15 NR_newRAT-Core
R2-1710606	BSR enhancement	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1710783	Considerations on BSR in EN-DC	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-
R2-1710900	Discussion on NR BSR formats	KT Corp.	discussion	
R2-1710918	Short BSR format	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1710963	BSR format in NR vivo		discussion	R2-1708491
R2-1711119	Details of BSR formats	ETRI	discussion	
R2-1711180	Further aspects on BSR transmission and cancellation			Rel-15 NR_newRAT-Core
R2-1711181	Aspects of BSR format and tables	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711185	BSR Text proposal	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711580	Long BSR format	Samsung	discussion	Rel-15 NR_newRAT-Core R2-1709585
R2-1711708	On BSR cancellation conditions Core R2-1709123	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-
R2-1711723	Flexible BSR	LG Electronics UK	discussion	NR_newRAT-Core R2-1709149

## 10.3.1.7 LCP

How to define and configure "time" in LCP restriction procedure Stage 3 details of capturing LCP restrictions and parameters. Single, converged stage 3 TP is encouraged

## Parameters

R2-1711423 LCP for grant-free transmissions MediaTek Inc., Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core R2-1708101

*Proposal 1: Logical channel restrictions for configured grants should be supported.*

*Proposal 2: Only logical channels that have critical requirements for transmitting on a particular configured grant scheme should trigger transmissions on that scheme.*

- Convida thinks that a good scheduler can minimize overloading these contention based resources. Mediatek thinks we should have the option restrict usage.
- Vivo thinks that we already agreed that we don't add any restrictions for SPS. LG clarifies that at the time we only considered dedicated SPS.
- Huawei thinks that it should be considered.
- Intel thinks that for URLLC we can use the combination SCS/Time we can handle the restriction. Lenovo agrees. Ericsson thinks that this is an optimization and we would result with two different behaviours.
- Nokia has some sympathy to avoid eMBB to use the resources and we can just add it as another parameter in LCP.
- Samsung doesn't see the need to consider this. LCP is enough.
- LG thinks that this is similar to eLAA and there is no reason to not support.

=> Noted

R2-1710634 LCP restrictions and modelling Intel Corporation discussion Rel-15 NR\_newRAT-Core

=> Noted

R2-1710299 Further consideration on the transmission profile parameters CATT discussion Rel-15 NR\_newRAT-Core R2-1707916

*Proposal 1: Logical channel restrictions are based on the total latency of the PUSCH assignment (including K2, the symbol-level starting position and duration of PUSCH) from any received UL grant.*

- Huawei ask what is the symbol-level starting position
- Lenovo thinks K2 has not been finalized in RAN1 and we should consider PUSCH transmission, that we know what it means.

*Proposal 2: Logical channel restrictions are configured per logical channel by means of a restricted Latency Window (LW) defined as  $[LW_{min} LW_{max}]$ , in ms.*

- Convida asks what happens if the latency doesn't fall within the window, it goes unused. CATT thinks that it could be up to the network and we can set the min window to zero.

*Proposal 3: LCP selects a logical channel for competing on an UL grant if the total latency of the grants assignment falls within the configured Latency Window of the logical channel.*

- QC asks if there are other components

=> Noted

R2-1711170 Remaining issues on LCP Ericsson discussion Rel-15 NR\_newRAT-Core

=> Noted

R2-1711728 LCP restriction LG Electronics UK discussion NR\_newRAT-Core

Proposal. The interval of consecutive PDCCH occasion is used as a time parameter for LCP restriction.

- Samsung thinks that we shouldn't using PDCCH occasion and periodicity can be complicated especially if we have different coreset. Also there is no defined relationship between PDCCH and PUSCH.

=> noted

Options on "Time":

1. *PUSCH transmission duration is used as the time information for LCP restriction (includes "slot/mini-slot" and other level of granularity )*
  2. *K2 + PUSCH transmission duration*
  3. *Total latency of the PUSCH assignment (including K2, the symbol-level starting position and duration of PUSCH) from any received UL grant.*
- Nokia doesn't think K2 is needed. InterDigital thinks that the configure PUSCH duration granularity
  - Samsung would be happy with PUSCH transmission duration
  - Convida understand that K2 can be based on UE capability and in that case there would be no alignment with the latency. Docomo thinks that to support low latency services K2 capability needs to be short.
  - CATT thinks that we can't limit to slot and non-slot, as we have cross slot scheduling as well. Huawei thinks that multi-slot is not yet agreed.
  - CATT thinks we should have a window rather than a max value.

Modeling

R2-1711009 Modelling options for LCP Samsung R&D Institute UK discussion

- convida asks if for both option 1b and 2 would equally have to figure out the allowed combinations.
  - Lenovo and Nokia think 1a is simpler. For option 1b or 2 we would have cell restriction.
  - InterDigital think the issue with 1a is that some periods are not allowed for some numerology and if we were to use 1a the number of combination are quite large. Option 2 is simplest from RRC.
  - Qualcomm, Intel and Huawei thinks 1a is best.
  - Ericsson and Samsung have some concern on the fact that not all combinations are supported.
  - Mediatek thinks we can also simplify 1b and 2 and they prefer 2.
  - CATT understands that T is a duration and it is simpler to go with 1b.
  - Oppo prefer the 1a.
  - Oppo thinks that one maximum value of T is sufficient. Lenovo thinks we can use the numerology to restrict usage.
  - Lenovo thinks that the two parameters have to match
  - Ericsson thinks that we need to consider future proof. Option 1a wouldn't work for that case.
  - CATT thinks we can consider using 1b for numerology/T and something like 1a for carrier restriction.
- => Noted

*On T being a single Max value*

- Oppo doesn't see a need to configure a list of T. Huawei explains that for sTTI we decided to indicate two values as a maximum value is not enough. The eNB wouldn't have the flexibility to disallow a eMBB to use the short TTI. Interdigital thinks that with one value you allow eMBB to use the short TTI. Qualcomm explains that we have numerology distinguish.
- Samsung explains a scenario.
- Nokia thinks for sTTI we only had two values.
- Ericsson thinks that we can have a max value per numerology
- Huawei asks how can we restrict eMBB from using a URLLC resource. Lenovo says we can use numerology. Interdigital ask what if there is a single numerology. CATT that numerology is used by scheduler to address a UE at cell edge independently of the logical channel.

LCP restriction for RACH

- Lenovo asks if we should allow all logical channels, for example for connected mode.
- Samsung thinks that perhaps we shouldn't differentiate in LCP. Lenovo indicates that the problem is that the eNB doesn't know the identify of the UE so how does it give the grant.
- Ericsson is now convinced by Samsung – maybe we don't need to do anything special. Huawei agrees and the BSR is included in msg3 so the next grant can take it into account.

R2-1711863 Summary of LCP options InterDigital discussion

Companies expressed preference to narrow down selection to the following three options:

- 1 Option 1a with a single T<sub>max</sub> value (11)
- 2 Option 1a with an interval of T<sub>min</sub> and T<sub>max</sub>. T<sub>min</sub> could be zero (5)
- 3 Option 1b (3)

- Ericsson thinks that there are some issues that still need to be investigated
- Samsung explains one concern with 1a that we cannot stop eMBB from using URLLC grant

Some companies expressed interest in more than one option.

A reference time unit of absolute value that is numerology agnostic can be used to set the values of T in option 1a. Some companies expressed interest in setting the unit of T in symbols.

- CATT thinks that we can agree to use a reference time unit in absolute value.

Agreements

- 1 As a baseline PUSCH transmission duration is used for LCP restriction. FFS on granularity
- 2 LCP restrictions applies to msg3 transmission as well.

☒ **[99bis#40][NR UP/ MAC] – LCP (Interdigital)**

- Downscope between options
- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

=> Guideline from chair

- Additional contributions should not address the open issues listed in the email discussion even if you don't agree with the proposed outcome

Other

Not treated

R2-1710633	Minimum UL grant and segmentation skipping in NR Rel-15 NR_newRAT-Core	Intel Corporation	discussion	
R2-1710372	LCP priority and procedure in NR Core R2-1708910	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710659	LCP for LCHs with Multiple RRC Configured Mappings 15 NR_newRAT-Core R2-1708729	InterDigital	discussion	Rel-
R2-1710819	UL skipping with LCH restriction NR_newRAT	Nokia, Nokia Shanghai Bell	discussion	Rel-15
R2-1710131	LCP restrictions and modelling	OPPO	discussion	
R2-1710300	Minimum Size of MAC PDU including DataCATT R2-1707917		discussion	Rel-15 NR_newRAT-Core
R2-1710316	Consideration on the transmission profile NR_newRAT-Core	ZTE Corporation	discussion	Rel-15
R2-1710317	Consideration on the LCP restriction NR_newRAT-Core	ZTE Corporation	discussion	Rel-15
R2-1710369	Further consideration on parameters for LCP restriction Rel-15 NR_newRAT-Core	Huawei, HiSilicon	discussion	
R2-1710370	LCP with grant-free transmission Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711305	NR LCP Modelling	MediaTek Inc.	discussion	
R2-1710371	Detailed modelling on LCP in NR Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710660	Logical Channel Selection in LCP	InterDigital	discussion	Rel-15 NR_newRAT-Core

R2-1710768	URLLC traffic considering multiple UL grants and LCP restriction parameters discussion				III
R2-1710818	Further details on LCP	Nokia, Nokia Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1710854	URLLC traffic considering multiple UL grants and LCP restriction parameters discussion			Rel-15	III
R2-1711012	LCP: handling multiple numerologies in NR using the 3-step procedure of LTE without modifications	Samsung R&D Institute UK	discussion		
R2-1711029	LCP procedure for NR	Lenovo, Motorola Mobility	discussion	Rel-15	NR_newRAT-Core
R2-1711033	Mapping of MAC CE during LCP	Lenovo, Motorola Mobility	discussion	Rel-15	
R2-1711171	Avoiding unnecessary padding for small grants	Ericsson	discussion	Rel-15	
R2-1711596	Discussion on How to Define "Time" for LCP	Samsung Electronics	discussion		
R2-1711597	Consideration of Grant-free Transmission from LCP perspective	Samsung Electronics	discussion		
R2-1711598	Discussion on Prioritization between MAC CE and LCH	Samsung Electronics	discussion		
R2-1711698	Additional parameters for LCP restriction	Qualcomm Incorporated	discussion	Rel-15	
R2-1711709	Order of transport blocks	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1711711	Dynamic priority for delay sensitive services	Qualcomm Incorporated	discussion	Rel-15	
R2-1711726	Step 1 in LCP	LG Electronics UK	discussion	NR_newRAT-Core	R2-1709147
R2-1711790	Analysis of Skipping Segmentation	Samsung	discussion	Rel-15	NR_newRAT-Core

### 10.3.1.8 SPS/Grant-free

*HARQ and transmissions aspects (e.g. HARQ identification with and without repetition, how to handle new data transmission on SPS occasions and retransmissions) (Max 1 contribution per company for this topic)*

*Progress on RAN2 specific aspects related to "type 1" (e.g. when UE starts using resources, naming of the schemes, etc) (Max 1 contribution per company for this topic)*

*Other RAN2 specific aspects related to SPS/Grant free (e.g. Whether multiple SPS configurations on SCells can be active at the same time, etc) (Max 1 contribution per company for all other related RAN2 aspects) RAN2 should strive for commonality between type 1 and type 2.*

- R2-1711252 SPS for Scell Ericsson discussion Rel-15 NR\_newRAT-Core
- Proposal 1 SPS operation can be active simultaneously for PCell/PSCell and SCell*
- Oppo supports but asks if we are assuming the LTE activation/deactivation or do we have any optimizations. Ericsson thinks LTE approach is sufficient, we will activate one at a time. Oppo asks if the UE has to send two MAC CE. Ericsson confirms but we don't have to activate simultaneously.
  - Vivo thinks we should limit the configuration to two
  - LG thinks that we should maybe allow MAC activation/deactivation rather than a DCI.
  - LG ask if we would need a SPS index. CATT proposes to use something similar to V2X. Ericsson thinks we can use the carrier index in the DCI. Oppo thinks that we need to inform RAN1 that we can activate from a PCell. Nokia explains that it would be treated like cross carrier scheduling. Interdigital thinks that RAN1 desing will be usable as is for Type 2.
- Proposal 2 SPS is configured per SCell*
- Samsung thinks we don't need to configure per SCell as we can use SPS-RNTI. LG we need to limit complexity and only support one SPS on one cell.

- Vivo explains that RAN1 design support multiple SPS per cell. Huawei explains that RAN1 decided we would have multiple resources for grant free. Samsung thinks that RAN1 just decided we can have multiple configuration but didn't decide whether it was per cell.
- Huawei thinks we should consider the reasons why RAN1 decided to have multiple configuration.
- Ericsson indicates that in RAN1 we don't distinguish between the two.
- Vivo thinks we should also tell RAN1 that we now have MAC CE
- Ericsson thinks that there may issues with HARQ even with grant free. Huawei doesn't see an impact.

*Proposal 3 RAN2 selects one of the following options:*

- Support only Type 2 SPS scheme for SCell*
  - Support both Type 1 and Type 2 SPS schemes for SCell*
- Huawei thinks that we should also support Type 1 to be configured in both
- => Noted

Agreements:

1. SPS/GF operation can be active simultaneously for PCell/PSCell and SCell. This applies to both Type 1 and Type 2.
2. For SPS, no optimizations to MAC CEs are pursued to support simultaneous activation/deactivation. The UE identifies the serving cell based on the grant mechanism (i.e. nothing special needs to be done)
3. SPS is configured per serving cell. For SPS, multiple SPS configurations per serving cell are not supported.

R2-1710662 SPS and Grant-free operation InterDigital discussion Rel-15 NR\_newRAT-Core R2-1708732

*Proposal 1: As in LTE, UE acknowledges release of DL resources using L1 signaling.*

- Vivo thinks that we should MAC CE for both UL and DL. Interdigital ask why we should deviate from LTE. Samsung agrees and points out that for DL skipping is not an issue.
- Vivo explains that we have the MAC CE. Ericsson explains that we may not have UL resources.

*Proposal 2: For UL Type 1, no additional acknowledgment mechanism is introduced on top of RRC acknowledgment.*

- Ericsson thinks that some form of synchronisation maybe needed to know when the UE is ready to use it. Nokia thinks it can be used immediately. Ericsson wonders how the Enb know when the UE starts using it if periodicity is more than TTI. Huawei agrees with Nokia and there is no big issue seen. Lenovo points out that we can give an offset in addition to the periodicity.

*Proposal 3: Consider support of implicit release of UL resources for Type 2 and notification of release via a MAC CE.*

- Nokia thinks that we agreed to this and one of the reason was that with skipping we may end up always reaching the number.

*Proposal 4: When a SCell is deactivated, all configured downlink assignments and uplink grants for this SCell are cleared.*

- Lenovo thinks that we should clarify what cleared means. Interdigital clarifies that it just means removing the grant.
- Nokia, and Oppo doesn't think we need to clear as once we activate we can still use it. Ericsson agrees.
- Lenovo thinks that we would need to store the SPS configuration. LG agrees and the network needs to track which resources are stored by the UE.

*Proposal 5: When a BWP is deactivated, all configured downlink assignments and configured uplink grants using resources of this BWP are cleared.*

About bandwidth part

- Interdigital thinks we need to at least ensure that the UE doesn't use the resources provided in one BWP when it changes BWP.



- Vivo doesn't think that we need to clear. Lenovo thinks that we don't need to clear but just suspend.

*Proposal 8: If there is overlap in time between a configured uplink grant and a dynamically scheduled uplink grant, the dynamically scheduled uplink grant overrides the configured uplink grant.*

- Nokia thinks we need more time to think if LCP restriction can cause some issues. The dynamic grant may contain a grant that doesn't allow the UE to transmit the URLLC. Interdigital considered that the network would handle the scheduling properly and if it is concerned it shouldn't schedule the dynamic grant. Nokia thinks that the network may not know UL arrival of data .
- Vivo has a similar concern as a dynamic grant may override the grant free. QC thinks we can leave it up to the UE implementation.

*On the need for MAC to be aware of BWP switching/deactivation/activation*

- LG thinks we need to discuss what BWP deactivation means
  - InterDigital, Lenovo think that it is clear in RAN1
  - Ericsson thinks that the MAC needs to be aware about the state of the BWP.
  - LG asks whether SPS is linked to a BWP or to a cell. Lenovo explains that SPS configuration is linked to a cell, but the grants are configured for a BWP.
  - Huawei asks why the UE needs to be aware of BWP. Interdigital thinks that there are a number of functions that are linked with the MAC, including DRX. CATT thinks another reason is the SR configuration. Lenovo needs to know whether it can use the BWP or not.
- => Noted

**Agreements:**

1. For SPS, as in LTE, UE acknowledges release of DL resources using L1 signaling
2. For Type 1, no additional acknowledgment mechanism is introduced on top of RRC acknowledgment
3. When a SCell is deactivated, the UE stops using all configured downlink assignments and configured uplink grants using resources of this SCell. FFS - when a SCell is deactivated, whether all configured downlink assignments and uplink grants for this SCell are kept and re-started or are cleared
4. FFS – if MAC is aware of state of the BWP (active or inactivate)
5. FFS - When a BWP is deactivated, the UE stops using all configured downlink assignments and configured uplink grants using resources of this BWP. FFS whether it suspends the configured grants of the or it clears it.
6. If there is overlap in time between a configured downlink assignment and a dynamically scheduled downlink assignment, the dynamically scheduled downlink assignment overrides the configured downlink assignment.
7. FFS If there is overlap in time between a configured uplink grant and a dynamically scheduled uplink grant, the dynamically scheduled uplink grant overrides the configured uplink grant

R2-1711253 Remaining issues on SPS UL Ericsson discussion Rel-15 NR\_newRAT-Core

*Proposal 1 As in LTE-SPS, retransmissions for SPS UL transmission are based on an uplink grant received on SPS C-RNTI.*

- Huawei thinks that this is fine for SPS, but for type 1 GF we need to consider other enhancements.
- LG asks if the gNB knows if the UE skipped or transmitted. Vivo doesn't think this isn't an issue. Nokia thinks the network can detect.
- LG asks if we need to handle the case that the UE receives a retx grant even if it didn't transmit anything.

*Proposal 3 In SPS UL, a time T after an UL transmission on a HARQ process is configured to wait for a retransmission UL-grant for the same HARQ process.*

- Qualcomm thinks that the time T should be related to HARQ timers.
- Vivo thinks we can summarize – after time T new transmission can override the HARQ.
- Samsung thinks the intention is good, but we need to discuss when it is started.

- Huawei thinks that we need to consider the case that there is no HARQ feedback. Ericsson confirms that they have considered it.
  - Nokia is concerned that we will always delay new data.
  - LG thinks after time T the UE can consider the data as NACKed if no new UL grant is received. Vivo thinks we should consider it as ACK and keep the data suspended in the buffer.
  - Samsung agrees with vivo
  - Nokia asks if it matters as the UE can't use that grant.
  - Convida thinks that the UL transmission may have failed and we shouldn't consider it as an ACK.
- => Noted

R2-1711431 HARQ and transmission for type 1 grant-free for active UE Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core

*Proposal 1: A monitoring window can be started with a configurable length at the UE to monitor the feedback after the initial GF transmission on a HARQ process.*

- Vivo asks if we assume ACK/NACK. Huawei thinks that the UE assumes NACK and retransmits.
- Huawei considers the key difference is that we have contention based resources. Nokia thinks autonomous retransmission would increase chances of collision. Samsung thinks that there are mechanisms for the eNB to detect which UE transmitted. LG doesn't see how the gNB can detect
- LG asks if we allow SPS retransmissions on SPS resources. It was agreed that we can only do retransmission by dynamic grant.
- Nokia thinks the UE can implicitly figure it out. Ericsson thinks that because we have asynchronous.

Proposal 2: If ACK/UL grant is not received after initial transmission, UE shall wait for GF resource to perform retransmission.

Proposal 3: When the maximum retransmission number reaches or ACK is received, UE shall initiate the new transmission with the associated HARQ process.

=> Noted

Agreements

1. For SPS, as in LTE-SPS, retransmissions for SPS transmission are based on uplink grant/DL assignments received on SPS C-RNTI. SPS C-RNTI configuration is provided by RRC signalling.
2. For SPS, MAC CE is used for confirmation of UL activation/deactivation.

For both Type1 GF and SPS.

3. FFS - A time T is started after an UL transmission on a HARQ process is configured to wait. FFS whether the UL Transmission is considered as ACK or NACK after expiry.
4. FFS – HARQ ID calculation

R2-1711263 DL SPS Operation in NR Samsung R&D Institute India discussion

*Proposal 2: Ask RAN1 whether for antenna port P0 and for antenna port P1 should be supported in NR*

- Interdigital thinks we should talk to RAN1 but also focus on general functionality, e.g. similar to LTE.
- Samsung thinks we can focus on what is different and make it more specific
- Vivo thinks that we can ask how the UE calculates the resource.
- LG thinks that we did agree to DL SPS but maybe we don't need to ask anything to RAN1, but maybe the granularity of the SPS resources.
- LG thinks that the consequence of this LS means that the RAN2 will not work on HARQ process ID. Samsung thinks we need the scheduling granularity to design the equation.
- LG thinks we should assume that all granularity for dynamic grant can be assumed.

=> Noted

R2-1711856 [Draft] LS to RAN1 on DL/UL SPS and GF Samsung LS out

LS to RAN1 –

- Indicate to RAN1 that RAN2 has agreed to DL SPS. Tell them so far agreements on DL SPS have assumed a similar framework.
- Ask questions (offline discussion)
- Provide agreements reached on UL SPS (e.g. Type 2 transmission) and GF Type 1

=> The LS is revised in R2-1711993

R2-1711993 [Draft] LS to RAN1 on DL/UL SPS and GF Samsung LS out

=> delete UL SPS “RAN2 asks following questions to RAN1 in relation to Grant-free Type 1 operations”

=> delete questions on antenna ports

=> The LS is approved in R2-1711871 with the changes above

☒ **[99bis#41][NR UP/MAC] – Open issues on SPS and GF (Huawei)**

- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)

- Outcome: Set of proposals to address the issues and a potential TP

- Deadline: Thursday 2017-11-09

=> Guideline from chair on open issues email discussions

- Additional contributions should not address the open issues listed in the email discussion even if you don't agree with the proposed outcome

Not treated

R2-1711710 On reliable transmission of URLLC data Qualcomm Incorporated discussion Rel-15  
NR\_newRAT-Core R2-1709125

R2-1711430 Configuration on type 1 grant-free for active UE Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core

Modeling

Not treated

R2-1710820 Unified Type 1 and Type 2 Grant-free operation Nokia, Nokia Shanghai Bell discussion  
Rel-15 NR\_newRAT

R2-1711272 Supporting Framework for Grant-free Type-1 and Type-2 Samsung R&D Institute India  
discussion

R2-1711429 Further discussion on the modelling of grant-free Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core

=> The document is revised in R2-1711692

R2-1711692 Further discussion on the modelling of grant-free Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core

R2-1710132 Support SPS on Scell OPPO discussion R2-1707742

R2-1710134 SPS operations on BWP switching OPPO discussion

R2-1710301 Grant-free transmission CATT discussion Rel-15 NR\_newRAT-Core R2-1707930

R2-1710302 Further consideration on multiple SPS CATT discussion Rel-15 NR\_newRAT-Core  
R2-1707931

R2-1710322 Consideration on SPS and grant-free ZTE Corporation discussion Rel-15  
NR\_newRAT-Core

R2-1710335 Considerations of the number of SPS configurations per cell group and TP for TS 38.321v1.0.0  
Samsung R&D Institute UK discussion

R2-1710959 HARQ process and Timer for SPS vivo discussion R2-1708487

R2-1710960 Collision between grant-based and grant-free resources on the same UL carrier vivo  
discussion R2-1708488

R2-1710975	Multiple SPS configurations on Scells	vivo	discussion		
R2-1711251	Modelling of SPS/Grant Free Scheme in NR NR_newRAT-Core	Ericsson	discussion	Rel-15	
R2-1711264	Draft LS to RAN1 on DL SPS Operation	Samsung R&D Institute India	LS out		
R2-1711288	Draft LS to RAN1 on Supporting Framework for Grant-free Type-1 and Type-2	Samsung R&D Institute India	LS out		
R2-1711422	UL HARQ identification for SPS	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1711571	Using multiple SPS on SCells	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1711579	Consideration on Type 1 resource control for NR 15 NR_newRAT-Core	LG Electronics Inc. R2-1708856	discussion	Rel-	
R2-1711699	On supporting SPS on SCells	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core

### 10.3.1.9 HARQ

R2-1711177	HARQ configurations in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
	=> Ericsson to provide input to parameter rapporteur and leave the structure discussion (David)				
	=> Noted				
R2-1711432	Discussion on HARQ configuration in NR	Huawei, HiSilicon	discussion	Rel-15	
	NR_newRAT-Core				
	=> Not treated				

### 10.3.1.10 DRX

*Finalize HARQ RTT configuration aspects and units used for HARQ RTT and DL/UL retx timers*

*Other issues related to DRX*

R2-1710755	Consideration on HARQ RTT Timer	LG Electronics Mobile Research	discussion		
	NR_newRAT-Core				
	<i>Proposal 3. In NR, gNB processing time is not considered for HARQ RTT Timer.</i>				
	- Samsung is not too optimistic about the gNB processing time and it should be configurable. Intel, OPPO and QC thinks gNB processing time should be an important component.				
	- Huawei thinks that we need to have a value X and since we can't determine it maybe can be configurable.				
	- CATT thinks that this depends on whether we have HARQ RTT.				
	- LG thinks that we can just assume that it is very small.				
	- Ericsson agrees to remove the HARQ RTT and power saving gains are very limited.				
	- Nokia is fine to remove HARQ RTT as well.				
	- Qualcomm thinks that if the processing delay is longer than a slot there is some power consumption. LG thinks that the only gain is when there is no more ongoing HARQ, at the end of the transmission burst.				
	- Lenovo agrees with Qualcomm				
	- Mediatek points out that the gNB can set a HARQ RTT based on UE capability and knowledge of its processing capability.				
	- Ericsson can accept a RRC signalling and to be future compatible for we should allow zero.				
	<i>Proposal 4. The drx-HARQ-RTT-TimerDL is started upon NR-PDSCH reception.</i>				
	- Oppo asks if this is different from LTE. LG explains that in MTC the UE starts HARQ RTT upon PDSCH reception and PDCCH and PSCH are not in the same sub-frame.				
	=> Noted				
R2-1710321	Consideration on DRX	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
	How HARQ RTT timer is determined:				

=> Noted

*When the timer starts:*

- Nokia thinks that if we start at PDSCH we don't need to consider the K1. Huawei explains that K1 is the time from PDSCH to ACK/NACK
- Samsung thinks that we should just stick to LTE baseline.
- Qualcomm thinks that HARQ RTT should only consider the static values.
- Huawei agrees with LG to start at PDSCH/PUSCH
- Nokia is concerned that if there is repetition the network can stop the bundle

Agreements	
1	DL/UL HARQ RTT timer is kept and is configured by RRC. Time unit is in ms. Values are FFS and zero is an allowed value.
2	DL HARQ RTT timer is started after PUCCH transmission
3	UL HARQ RTT timer is started after PUSCH transmission. FFS whether it is the last PUSCH transmission of a bundle
4	Like in LTE, the drx-RetransmissionTimerDL is started when drx-HARQ-RTT-TimerDL expires
5	Like in LTE, the drx-RetransmissionTimerUL is started when drx-HARQ-RTT-TimerUL expires
6	UE starts or restart drx-InactivityTimer when it receives a PDCCH indicating a new transmission as in LTE

R2-1710607 C-DRX enhancement in NR Intel Corporation discussion Rel-15 NR\_newRAT-Core

*Proposal 3. A new timer (BWP inactivity timer) is introduced to switch active BWP to default BWP after a certain inactive time.*

*Proposal 4. Autonomous switching to DL default BWP should consider both DL BWP inactivity timer and DRX timers (HARQ RTT and DRX retransmission timers).*

- Convida thinks that there is risk you never go to DL default BWP if you are in active. Intel thinks that's ok as the UE receiving.
- Qualcomm thinks we shouldn't be concerned with this, as the UE will flush the buffers. Interdigital explains that we shouldn't switch during this active DRX time as there may data transmissions.
- Huawei thinks that the network can consider setting these timers accordingly. Nokia also agrees. The timer is started everytime the UE is scheduled. Intel and InterDigital think that the network should have the flexibility to set timers that are shorter.
- Mediatek agrees and doesn't think DRX and BWP should be linked.

=> Noted

Agreements:	
1	RAN2 confirms, a new timer (BWP inactivity timer) is introduced to switch active BWP to default BWP after a certain inactive time. BWP inactivity timer is independent from the DRX timers.

Not treated

R2-1710663 Timer-based Change to Default Bandwidth Part InterDigital discussion Rel-15 NR\_newRAT-Core

R2-1711199 Timer-based BWP switching Samsung discussion Rel-15

R2-1711714 Beamformed NR C-DRX operation Samsung Electronics discussion

R2-1711702 Wakeup signaling for C-DRX mode Qualcomm Incorporated, Apple, OPPO discussion Rel-15 NR\_newRAT-Core R2-1709652

R2-1710206 HARQ RTT timer Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core R2-1707726

R2-1710207	Units of DRX timers	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710208	Impacts of BWP on DRX	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710209	Details in DRX operation	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710303	Discussion on DRX Timers	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710350	Discussion on HARQ RTT Timer	OPPO	discussion	
R2-1710661	Remaining details on DRX	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1710823	Discussion on DRX timers related issues in NR	Potevio	discussion	
R2-1710952	DRX timer for SPS	Samsung	discussion	Rel-15 NR_newRAT-Core R2-1709012
R2-1710972	Discussion on HARQ RTT Timer	vivo	discussion	
R2-1711083	HARQ RTT timer and DRX retransmission timer discussion	ASUSTEK COMPUTER (SHANGHAI)		Rel-15 NR_newRAT-Core
R2-1711084	Numerology for PDCCH Monitoring during DRX Active Time (SHANGHAI)	ASUSTEK COMPUTER	discussion	Rel-15 NR_newRAT-Core R2-1709326
R2-1711167	C-DRX timers	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711172	HARQ RTT timers and other remaining issues in DRX	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711198	Power saving for wideband carrier in NR	Samsung	discussion	Rel-15
R2-1711703	Wakeup signaling for multi-beam systems NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-15 R2-1709116
R2-1711704	UE power saving during active state NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-15 R2-1709117

### 10.3.1.11 Impact of PDCP duplication on MAC

*MAC CE for activation/deactivation of PDCU duplication*

*Aspects related to fallback to split bearer and handling of RLC/PDCP entities during activation/deactivation should be submitted in AI 10.3.3.5*

*This AI will not be treated*

Not treated

R2-1710304	Duplication activation/deactivation MAC CE	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710756	Details of bitmap design	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710757	BSR procedure for data duplication NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15 R2-1707713
R2-1710758	Cell deactivation impacts on PDCP duplication	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1709102
R2-1710759	PBR configuration for duplication DRB NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710958	Duplication deactivation due to Scell or BWP deactivation	vivo	discussion	R2-1708489
R2-1710968	PDCP duplication impacts on LCP	vivo	discussion	R2-1708502
R2-1711085	PDCP duplication and SCell (de-)activation discussion	ASUSTEK COMPUTER (SHANGHAI)		Rel-15 NR_newRAT-Core R2-1709327
R2-1711248	PDCP duplication control related to SCell control NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1711411	MAC impact of duplication discard	MediaTek Inc.	discussion	Rel-15 NR_newRAT-Core R2-1708100
R2-1711424	MAC CE design for duplication	MediaTek Inc.	discussion	Rel-15 NR_newRAT-Core R2-1708102

R2-1711705 Impact of PDCP duplication on BSR in the CA case Qualcomm Incorporated discussion  
 Rel-15 NR\_newRAT-Core R2-1709118

### 10.3.1.12 PHR

*PHR triggers, reporting, handling, for single and dual connectivity (i.e. without beamforming)*

*PHR in the presence of beamforming may be down prioritized and treated if RAN1 has made progress and if some input from RAN2 is needed.*

R2-1710318 Consideration on PHR in NR ZTE Corporation discussion Rel-15 NR\_newRAT-Core

*Proposal 1: The power sharing between LTE and NR is allowed in NSA operation and the maximum allowed transmission power for LTE( $P_{LTE}$ ) and NR( $P_{NR}$ ) should be configured separately, and both  $P_{LTE}$  and  $P_{NR}$  can be configured up to  $P_{cmax}$ .*

*Proposal 2: The PHR procedure should be supported in NR, and the power headroom information will still be carried in MAC CE.*

*Proposal 3 PHR trigger conditions defined in LTE should be reused in NR.*

- Vivo asks if we would have different format
  - Qualcomm thinks that we could have new triggers (e.g. waveform change) if the PL is large. Convida thinks we have enough triggers for now to ensure that the PHR is sent.
  - Huawei indicates that RAN1 has already agreed that waveform change doesn't need to trigger a PHR
- => Noted

PHR types

- Vivo ask about type 3. Samsung thinks that this related to SRS. Lenovo thinks that we should wait for RAN1 to tell us.
- Vivo asks whether we intent to support virtual and real

R2-1710610 Impact of BWP on PHR Intel Corporation discussion Rel-15 NR\_newRAT-Core

*Proposal 1: Unless there is request from RAN1, PHR is not triggered due to the switching of BWP.*

*Proposal 2: BWP does not impact the PHR MAC CE format design in NR.*

- Vivo and Huawei think we should wait. Interdigital doesn't see a need to trigger a PHR so we can make an assumption
  - Vivo thinks that there may be independent power control.
  - Samsung thinks we shouldn't have impact to the BWP. Vivo thinks that maybe the UE have to report virtual for non-active BWP
- => Noted

**Agreements**

1. The power headroom information will still be carried in MAC CE.
2. Virtual and real PHR type 1 and Type 2 are supported
3. At least PHR trigger conditions defined in LTE should be reused in NR
4. Assume BWP does not impact the PHR MAC CE format design

R2-1710954 PHR format for NR Samsung discussion Rel-15 NR\_newRAT-Core

- Lenovo thinks that we should do something similar to flexible BSR on how to determine number of PHRs to report. At least it should be clear at the beginning of the LCP
  - LG asks if the cell index field is shared between LTE and NR
  - ZTE asks how do we handle the mapping table PHR value and power for EN-DC. Ericsson thinks we can do the same as LTE. ZTE wants to confirm that we refer to the right specification.
- => Noted

**Agreements**

- |   |  |
|---|--|
| 1 | RAN2 designs NR PHR format with assumption that the field PH is 6-bit, as in LTE.  |
| 2 | RAN2 sends an LS to RAN1 and RAN4 to inform the decision.  |
| 3 | As in LTE, V field is used in NR to indicate whether PH is based on real transmission or a reference format, and the presence of the PCMAX,c octet.  |
| 4 | NR supports PHR format consisting of bitmap, type 2 PH subfield for PCell, type 2 PH subfield for either PUCCH SCell or PSCell, and type 1 PH subfields in the ascending order of ServCellIndex.   |
| 5 | The presence of type 2 PH is explicitly configured by RRC signalling.  |
| 6 | One octet of bitmap is used for indicating the presence of PH per SCell when the highest SCellIndex of SCell with configured uplink is less than 8. Otherwise four octets are used. Editor's note "it depends on whether we support 32 carriers" |
| 7 | P field indicates whether the MAC entity applies power backoff due to power management.  |
| 8 | For EN-DC the assumption is that the cell index space is shared between LTE and NR. [CB for CP]  |
| 9 | FFS For EN-DC how to ensure we are referring to the right specification for the PHR table  |

R2-1711868 Draft LS to RAN2 agreements related to PHR Samsung LS out  
=> To RAN1 and RAN4  
[CB #323]

Not treated

R2-1710664	Power Headroom Reporting for NR Core R2-1708733	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1710767	Consideration on PHR in EN-DC Core R2-1708957	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710953	PHR triggering events for NR R2-1704481	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1711032	PHR for NR CA	Lenovo, Motorola Mobility	discussion	Rel-15 NR_newRAT-Core
R2-1711182	Power headroom reporting in NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711183	PHR text proposal	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711433	PHR reporting in different TTI lengths	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711434	Consideration on PHR with multi-beam operation	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711435	Power management with multiple numerologies	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711436	Consideration on PHR triggering and cancellation in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711437	Content of the PHR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711612	PHR for multi-beam operation	PHR for multi-beam operation	discussion	Rel-15 NR_newRAT-Core
R2-1711613	PHR for wider bandwidth operation	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1711667	PHR in PDCP duplication with CA ITL	discussion	Rel-15	
R2-1711700	PHR trigger by waveform change	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1711706	PHR for UL Split Bearer	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1711798	Guaranteed power for Power Headroom in EN-DC	Samsung Electronics	discussion	Rel-15 NR_newRAT-Core
R2-1711799	NR PHR for EN-DC	Samsung Electronics	discussion	Rel-15 NR_newRAT-Core
R2-1711800	PHR triggering event for beam change	Samsung Electronics	discussion	Rel-15 NR_newRAT-Core



- R2-1711801 Extended PHR considering beam and TRxP change Samsung Electronics discussion  
 Rel-15 NR\_newRAT-Core R2-1709574
- R2-1711821 PHR for NR NTT DOCOMO INC. discussion Rel-15 NR\_newRAT-Core

### 10.3.1.13 Other

*Other aspects not included in the detailed agenda items.*

#### IMPACT OF BWP

*After offline*

*Behaviour on the BWP that is deactivated*

- b1) not transmit on UL-SCH on the BWP;
- b2) not monitor the PDCCH on the BWP;
- b4) not transmit PUCCH on the BWP;
- b5) not transmit on PRACH on the BWP;
- Qualcomm thinks that if there PRACH configured there is a case where the UE may want to go back. Ericsson thinks that once you want to do RACH you consider it activated.
- b6) do not flush HARQ buffers when doing BWP switching (unless an issue is identified)
- Ericsson asks why, this will result in losing data
- Interdigital thinks that this is not the same as SCell as you can switch to another BWP, so no need to flush all HARQ buffers. Lenovo agrees

- R2-1711872 [Draft] LS to RAN1 on RAN2 agreements related to BWP Huawei LS out  
 [CB #325]

**Agreements:**

- 1 Behaviour on the BWP that is deactivated
  - not transmit on UL-SCH on the BWP;
  - not monitor the PDCCH on the BWP;
  - not transmit PUCCH on the BWP;
  - not transmit on PRACH on the BWP;
  - do not flush HARQ buffers when doing BWP switching (unless an issue is identified)
- 2 RAN2 will not support MAC CE BWP switching

**[99bis#43][NR UP/MAC] Impact of BWP (LG)**

- Identify impact of BWP on different MAC functions
- Outcome: set of proposals and potential TP
- Deadline Thursday 2017-11-09

Guideline

- Contributions on impact of BWP on different AIs will not be treated.

- R2-1710956 UL Time Alignment for NRSamsung discussion Rel-15 NR\_newRAT-Core  
*Proposal 1: As in LTE, TimeAlignmentTimer is started/ restarted to maintain uplink time alignment.*

*Proposal 2: As in LTE, TimeAlignmentTimer is configured per TAG.*

- Huawei thinks we need to consider the grant free scheme where the UE doesn't clear the configured grant.
- Samsung thinks the UE should not transmit without timing alignment. Huawei points out that whether the UE transmits is a different issue. Lenovo thinks that it is the network responsibility to make sure that the timing alignment is maintained. Nokia also points out that we release PUCCH so we shouldn't change this behaviour for grant-free. Convida thinks that expiry of timer is a rare event so re-configuration of RRC is not a big problem.
- Lenovo asks what happens for INACTIVE state. LG thinks we need to discuss further.
- Asustek thinks that there may be a problem if we have TAG per beam pair.

*Proposal 3: Different numerologies may be configured for different TAGs, but it is up to network implementation i.e. no need to capture it in the specification.*

- Nokia thinks it should be clarified what is different numerology
- => Noted

**Agreements**

- 1 As in LTE, TimeAlignmentTimer is started/ restarted to maintain uplink time alignment.
- 2 As in LTE, TimeAlignmentTimer is configured per TAG.
- 3 UE behaviour when timer expires is similar LTE (e.g. PUCCH release, SPS grant, etc). FFS if anything special needs to be done for RRC configured grant free resources.

R2-1711168 Timing advance in NR Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Not treated

R2-1711438 Maintenance of uplink time alignment in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
=> Not treated

R2-1710135 Activation and deactivation of Scells OPPO discussion  
=> Noted

*The initial state*

- LG, Ericsson, QC, Asustek, Nokia think that it should be configurable
- Docomo asks how the network resolves the ambiguity period. LG thinks that it can be the same as PSCELL for CSI reporting etc. Docomo thinks its different. Samsung has similar concern.
- Huawei thinks that it should be deactivate as it will be difficult to determine timing
- Lenovo asks how the UE takes measurements. In LTE the UE is allowed to take measurements before it is activated. LG thinks that RAN4 would have to determine how long CSI-SR reporting is allowed.
- Ericsson thinks that in LTE they are discussing to allow it so we should do it for NR. We can have the framework and if at the beginning we can't support it we can configure inactive.
- Vivo also doesn't like to be configurable.

*6 The configured SCell can be activated by activating one of the BWPs configured for the SCell.*

- Intel thinks that we should use the MAC CE to activate the SCell. Convida thinks that this is an optimization
- Samsung says RAN1 agreed that in the RRC configuration there is a BWP associated to the SCell and when the SCell is activated the UE know which BWP to activate.

*7 The configured SCell can be deactivated by deactivating all the active BWPs configured for the SCell*

- Nokia understands that the RAN1 commands are just to switch and not deactivate. Interdigital confirms that the agreement is to have on active BWP and not zero.

**Agreements**

1. The initial state of a configured SCell is deactivated. Whether the SCell activation state can be configurable, can be discussed after December timeframe.
2. From RAN2 point of view, no additional mechanisms other than MAC CE are needed for SCell activation/deactivation

LS to RAN1 – Oppo

- Provide agreements related to SCell activation/deactivation

R2-1711867 Draft LS on RAN2 agreements related to Scell activation/Deactivation Oppo LS out [CB #321]

Not treated

R2-1711439 CA activation and deactivation in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

R2-1711725	Error handling in MAC	LG Electronics UK	discussion	NR_newRAT-Core	R2-1709146
R2-1710769	Scell activation and deactivation in EN-DC	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core R2-1708965
R2-1710782	Considerations on TTI-bundling in EN-DC	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1710955	Text proposal for a new clause for the handling of measurement gap	Samsung	discussion	Rel-15	NR_newRAT-Core R2-1709018
R2-1711082	Discussion on Timing Advance in NR	ASUSTEK COMPUTER (SHANGHAI)	discussion	Rel-15	NR_newRAT-Core R2-1709329
R2-1711184	Power control aspects	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711194	Time unit for scheduling and HARQ in NR	Samsung	discussion	Rel-15	
R2-1711196	Draft LS to RAN1 about RAN2 decisions on TTI	Samsung	LS out	Rel-15	
R2-1711197	Time unit for some MAC operations - subframe and slot	Samsung	discussion	Rel-15	
R2-1711254	Enhanced HARQ feedback mode in SPS	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711259	BSR for Multiple Numerology Operation	Samsung R&D Institute India	discussion		
R2-1711261	Determining Value of X for LCP	Samsung R&D Institute India	discussion		
R2-1711297	Retransmission Aspects for Uplink SPS	Samsung R&D Institute India	discussion		
R2-1711440	Draft LS on CA activation delay of Scell	Huawei, HiSilicon	LS out	Rel-15	NR_newRAT-Core
R2-1711441	MAC impact of bandwidth part activation/deactivation	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1711569	SPS with implicit SCell deactivation	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1711570	Restart condition of sCellDeactivationTimer with skipping operation	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1711604	Potential Issues for BSR Latency Reduction	Samsung Electronics	discussion	R2-1709607	
R2-1711605	Potential Issues for UL Transmission with Shared UL Grant among Multiple Ues	Samsung Electronics	discussion	R2-1709608	
R2-1711637	On the TTI and Subframe in NR	Samsung	discussion	NR_newRAT-Core	
R2-1711639	[Draft] LS on the TTI definition	Samsung	LS out	NR_newRAT-Core	
R2-1711643	Activation of SCell containing BWPs	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1711724	Reconsideration of sCellDeactivationTimer	LG Electronics UK	discussion	NR_newRAT-Core	
R2-1711727	Initial state of SCell	LG Electronics UK	discussion	NR_newRAT-Core	R2-1709152
R2-1711795	RAN2 consideration on user plane latency enhancement	Samsung Electronics GmbH	discussion	R2-1709171	

## 10.3.2 RLC

### 10.3.2.1 TS

*Latest TS 38.323, rapporteur inputs, etc*

*Including output from email discussion [99#11][NR UP] – Running draft TS 38.322 – Mediatek*

*Please provide input to the rapporteur for corrections. Single/combined rapporteur TP is encouraged.*

- ☒ **[99bis#59][NR UP/RLC] Open issues related to RLC (Ericsson)**
- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

=> Guideline from chair on open issues email discussions

- Additional contributions should not address the open issues listed in the email discussion even if you don't agree with the proposed outcome

- ☒ **[99bis#13][NR UP/RLC] – Running TS 38.322 – Mediatek**
- Agreeable TS to be endorsed next meeting
- Deadline 3 weeks after the meeting

Not treated

- R2-1710249 Consistence of RLC Tx behavior SHARP Corporation discussion
- R2-1710917 Text Proposal on NR RLC release procedure Samsung R&D Institute India discussion  
Rel-15
- R2-1710976 Text Proposal on LTE RLC release procedure for EN-DC Samsung R&D Institute India  
discussion Rel-15

### 10.3.2.2 RLC header format

*Contributions should focus only on critical issues/corrections related to agreed RLC PDU format (e.g. not enhancements)*

- R2-1711619 RLC PDU accommodation in multi MAC PDUs NTT DOCOMO INC., Ericsson discussion  
Rel-15 NR\_newRAT-Core

Proposal1: Confirm that RLC PDUs from the same logical channel are accommodated into the MAC PDU continuously based on RLC SN.

- LG and QC support
- Mediatek indicates it was discussed in SI and we agreed to not have such restrictions. Intel agrees and doesn't want to limit the implementation. Docomo wants to prevent bad UE behaviour.
- Mediatek and Lenovo thinks that this would prevent parallel processing for CA case. Docomo thinks then in that case the NACK range wouldn't be useful. NACK range is still useful for single case.
- CATT and Fujitsu support the proposal. Fujitsu supports.
- Samsung doesn't see the need to restrict UE implementation, the UE won't intentionally do it.
- Docomo thinks this is not acceptable from a performance point of view.
- Ericsson thinks that we have some notes in MAC to avoid excessive segmentation, etc. We can do something similar.
- MEdiatek asks how is this problem than LTE. Docomo explains that in NR we may have more SNs due to larger MAC TB size
- LG and Huawei thinks in most cases we would have one RLC PDU in MAC PDU.

Proposal1a: Discuss which spec captures it, RLC or MAC.

- Huawei thinks it should be in the MAC like in LCP
- Samsung thinks that the MAC doesn't see SN.

=> Noted

Agreements

=> Capture as a note in the RLC that UE should aim to prevent excessive out of order RLC SNs in a MAC PDU.

- R2-1710697 Finalization of AMD PDU and STATUS PDU formats      MediaTek Inc.      discussion      Rel-15  
 NR\_newRAT-Core
- Nokia and Ericsson thinks that it made the 12 bit SN and 18 bit SN different and should be aligned.
- => Noted

Agreements:

- 1 The AMD PDU formats in the draft TS are confirmed, and corresponding Editor's note is removed
- 2 No further optimizations on current STATUS PDU format are pursued

Not treated

- R2-1711268 Remaining details of RLC STATUS PDU format      Nokia, Nokia Shanghai Bell      discussion  
 Rel-15 NR\_newRAT
- R2-1711789 Presence of E1 in RLC Status Report      Samsung      discussion      Rel-15 NR\_newRAT-Core
- R2-1710211 Issues on RLC status PDU construction      Huawei, HiSilicon      discussion      Rel-15  
 NR\_newRAT-Core

### 10.3.2.3 RLC UM operation

*Including output from email discussion [99#35][NR UP] Reassembly for RLC UM – Qualcomm*

*Contributions on how to capture the reassembly other than input from [99#35] are discouraged. Comments should be provided in email discussion. If an alternate TP is proposed, a converged, multi-company TP should be provided.*

*Other contributions should focus only on critical issues/corrections related to agree functionalities*

- R2-1711542 Report of email discussion [99#35][NR UP] Reassembly for RLC UM      Qualcomm  
 Incorporated      discussion      Rel-15 NR\_newRAT-Core
- => Update definition "This state variable holds the value of the SN following the SN which triggered *t-Reassembly*."
  - LG thinks that we should cover the duplicate detection for segments. QC explains we already agreed to not support it and it is done during reassembly.
  - Huawei also thinks that we should handle duplicate segment detection. Nokia thinks that the MAC can handle duplicate detection.
- => The understanding is that MAC will handle duplicate detection at the HARQ level  
 => the TP is endorsed with the change above
- R2-1710212 Remaining issues for RLC UM procedure      Huawei, HiSilicon      discussion      Rel-15  
 NR\_newRAT-Core
- CATT explains the reason for the text and one intention is to ensure the timer is related to the HARQ delay and not scheduler delay. The issue in this contribution is a less severe.
  - Huawei thinks we should include scheduling delay because of asynchronous HARQ.
  - LG supports Huawei and timer shouldn't be stopped until reassemble.
  - Ericsson agrees with CATT
- => Noted
- R2-1711655 Transmitting UM RLC entity re-establishment      Sequans Communications      discussion  
 Rel-15 NR\_newRAT-Core
- => Noted

**Agreements**

1. Upon transmitting UM RLC entity re-establishment, the UM RLC entity shall also discard all UMD PDUs

2. Upon transmitting UM RLC entity or AM RLC entity re-establishment (transmitting side) RLC SDU segments are also discarded

### 10.3.2.4 Impact of PDCP duplication to RLC

*This AI will not be treated*

Not treated

R2-1710760	RLC optimization for packet duplication NR_newRAT-Core R2-1709498	Huawei, HiSilicon	discussion	Rel-15
R2-1710761	Further consideration on RLF indication NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710762	RLC behaviours upon duplicate deactivation Rel-15 NR_newRAT-Core R2-1707718	Huawei, ASUSTek, HiSilicon	discussion	
R2-1711409	RLC impact of duplication discard R2-1708099	MediaTek Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1711786	Interaction between RLC Entities for PDCP Duplication 15 NR_newRAT-Core R2-1709027	Samsung	discussion	Rel-15
R2-1711788	RLC Max Retransmissions in CA Duplication NR_newRAT-Core	Samsung	discussion	Rel-15

### 10.3.2.5 RLC AM operation

*Issues related to RLC Polling and Status reporting (max 1 contribution per company for this topic)*

*Other issues related to transmission/re-transmissions of AMD PDUs*

Polling

R2-1710696	Text proposal for RLC AM polling mechanism NR_newRAT-Core R2-1708268	MediaTek Inc.	discussion	Rel-15
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=> Noted

R2-1711541	Further details of RLC Polling Procedure NR_newRAT-Core R2-1708949	Qualcomm Incorporated	discussion	Rel-15
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*Proposal 1: PDU\_WITHOUT\_POLL and BYTE\_WITHOUT\_POLL are updated, and reset if the updated value exceeds the threshold pollPDU or pollByte, upon the transmission opportunity is notified by the lower layer as in LTE baseline.*

- Huawei proposes to use the SDU\_Without\_poll
- LG and Intel supports the Mediatek TP
- LG asks if transmission opportunities is linked to pre-processing. Qualcomm explains that the intention was to decouple. CATT thinks that it is easy to determine the polling bit even for pre-processing.
- Mediatek one advantage of their proposal is that it is more predictable from the UE side.
- Huawei is concerned about using PDU.
- LG thinks we don't restrict the timing of when we set the poll bit.
- Ericsson thinks that we can consider only the PDUs that have a new SN.
- Samsung thinks that it is an optimization and the only consequence is the frequency of the status reporting.
- Nokia thinks that we should consider only new data and this is like LTE.
- Huawei thinks that the last PDU in the buffer has to be linked to the transmission opportunity

=> Noted

Agreement

1. BYTE\_WITHOUT\_POLL is updated for PDUs with new byte segments assembled.  
PDU\_WITHOUT\_POLL is updated for new PDUs (e.g. the PDUs with data not previously transmitted)

2. The PDU\_WITHOUT\_POLL and BYTE\_WITHOUT\_POLL increment and reset are performed per PDU.
3. Poll bit is included in the header of the RLC PDU that triggered the polling bit  
FFS - PDU\_WITHOUT\_POLL and BYTE\_WITHOUT\_POLL are updated, and reset if the updated value exceeds the threshold pollPDU or pollByte, *upon the transmission opportunity is notified by the lower layer as in LTE baseline.*

- R2-1710215 Remaining issues for polling in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
Core R2-1709661 Withdrawn
- R2-1711250 RLC STATUS report format and polling Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Not treated
- R2-1710777 Remaining issues for polling in NR and EN-DC Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
*Proposal 5: RAN2 should confirm that, for EN-DC, the note in 36322 for polling, which is related to the PDCP data submission after RLC request, should still apply for LTE-RLC, while it should not apply for NR-RLC.*
- Samsung thinks that pre-processing is not allowed for EN-DC. Mediatek thought it was for the NR leg.
- => Noted
- R2-1711269 Clarification to the ARQ procedures Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
- LG and Huawei don't see a problem as the receiver will indicate in the status report.  
=> Noted
- R2-1710821 Segmentation based gap detection for AM operation Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
Proposal 2: introduce segment based gap detection for AM as done for UM.
- LG doesn't support and is also related to the status update. Nokia thinks that for AM the problem is even worst as for AM as you would trigger a status report. Samsung has same view
- Proposal 3: ACK\_SN in the status report only ACK the SNs < ACK\_SN (except for those not NACKed), i.e. the SN with ACK\_SN cannot be ACKed, as RX\_Next\_Highest which is used for RX\_Next\_Status\_Trigger then used for ACK\_SN is set to the value of the SN following the SN of the RLC SDU with the highest SN among received RLC SDUs, even though the last one was not fully received.
- LG is ok with intention
  - Mediatek thinks this is an optimization and it will work without this.
- => Noted

**Agreements**

- 1 align the variable names for AM with UM:
  - change RX\_Next\_Highest\_Rcvd to RX\_Next\_Highest;
  - change t-Reorderring to t-Reassembly.
- 2 Introduce segment based gap detection for AM as done for UM. SO based variables will not be introduced.

Not treated

- R2-1710902 RLC AM status reporting issue Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core  
Core
- R2-1711567 Need of early RLC STATUS reporting LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core
- R2-1711590 t-reordering in RLC AM Samsung discussion Rel-15 NR\_newRAT-Core R2-1709598

- R2-1710213 Remaining issue for RLC AM operation Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core
- R2-1710306 NR RLC AM operation and status reporting CATT discussion Rel-15 NR\_newRAT-  
Core R2-1707935
- R2-1710323 Consideration on the T-reordering handling for AMD PDU segment ZTE Corporation  
discussion Rel-15 NR\_newRAT-Core

### 10.3.2.6 Other

*Clarify UE requirement on PDCP discard and SN utilization for pre-processing (max 1 contribution per company for this topic)*

*Other remaining issues for RLC*

- R2-1711574 RLC SDU discard procedure in NR LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1708850

*In NR, the RLC entity discards a RLC SDU only if no segments of the RLC SDU has been submitted to the lower layer. If any segment of the RLC SDU is already submitted to the lower layer, the RLC entity does not discard the RLC SDU but keeps transmitting it.*

- Mediatek asks what it means – if the MAC headers are created does it mean it is submitted.
  - LG assumes that in that case the UE can re-create the headers. Mediatek proposes maybe we can say transmitted
- => Not treated

- R2-1711594 RLC SDU discard procedure Sequans Communications discussion Rel-15  
NR\_newRAT-Core

- Ericsson considers the pre-processed RLC PDUs wouldn't be part of the transmission window.
  - Lenovo thinks that we shouldn't have an issue as we don't pre-process to much. Mediatek agrees.
- => Not treated

- R2-1711746 RLC pre-processing Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT

*Proposal 1: RLC PDUs are submitted to lower layers only when a transmission opportunity has been notified by lower layer – TX\_Next (if incremented) is only updated in procedural text when the RLC PDU is delivered to lower layer.*

- Huawei agrees as the MAC has no buffer
  - Lenovo thinks that we shouldn't specify when the UE creates RLC PDU.
  - Intel asks how the TX\_next is updated. Nokia thinks there should be clear behaviour to make RLC testable.
  - Intel thinks we can just capture RLC SN gap is never allowed in the transmitter side. Samsung thinks that it is a good compromise. Huawei thinks it should be normative.
  - Qualcomm thinks we can still pre-process even if we don't increment TX\_next
- => Noted

*Issue 0*

=> Assumption: It is allowed for RLC PDUs to still be formed before notified by lower layer of a transmission opportunity and MAC headers can be pre-created.

*Issue 1*

Should RLC PDUs be *submitted* to lower layers only when a transmission opportunity has been notified by lower layer?

- Yes (7)
- No (9)

*Issue 2*

*How do we manage the SN gap*

*Option 1*



- *TX\_Next (if incremented) is only updated in procedural text when the RLC PDU is delivered to lower layer*
- Option 2
- *Capture in normative text RLC SN gap is not allowed in the transmitter side. In NR, the RLC entity discards a RLC SDU only if no segments of the RLC SDU has been submitted to the lower layer*

**Agreements**

- *Assumption: It is allowed for RLC PDUs to still be formed before notified by lower layer of a transmission opportunity and MAC headers can be pre-created*
- 1 *In NR, the RLC entity discards a RLC SDU only if no segments of the RLC SDU has been “transmitted over the air”/”mapped to a transport block”.*
- 2 *RAN2 intention is that no RLC SN gap are allowed. The procedures in the specs should prevent this situation from occurring. A NOTE can be added “that RLC SN gap are not allowed in the transmitter side.”*

Not treated

- R2-1710136 Pre-processing in RLC layer OPPO discussion
- R2-1710137 RLF on the SCell RLC OPPO discussion R2-1707746
- R2-1710210 Way forward for RLC Pre-processing Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1710214 New values for RLC timers Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

*Proposal 1: For t-PollRetrasnmit and t-StatusProhibit, in addition to those values in LTE, 0.05ms and multiples of 0.05ms can be introduced in NR.*

- Samsung thinks LTE values should be enough. Huawei thinks we need to consider numerology
  - LG thinks that some new values are needed
- => The detailed values for the times will be discussed with the email discussion on parameters.
- => *Noted*

☒ **[99bis#18][NR] L2 parameters in RRC (Huawei)**

- After merge of TPs from this meeting in draft TS, continue to progress the L2 parameters ASN.1 and corresponding field descriptions and procedure text. To include:
  - updating to capture agreements from this meeting
  - discuss required parameters and value ranges (starting point those in TP)
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting
- Deadline: Thursday 2017-11-09

- R2-1710898 Consideration on the separate SN length configuration for UL and DL in RLC and PDCP ZTE Corporation discussion Rel-15 NR\_newRAT-Core
- => *Noted*

**Agreements**

- 1 RLC SN length can be separately configured for UL and DL
- 2 PDCP SN length can be separately configured for UL and DL

- R2-1710307 RLC failure and RLF in CA CATT discussion Rel-15 NR\_newRAT-Core R2-1707923

*Proposal 1: For a logical channel restricted to one or multiple SCell(s) (including logical channel configured for non-duplication) UE reports the failure to the gNB (e.g. SCell-RLF) but no RRC re-establishment happens.*

- CATT explains that this can result due to numerology restrictions

- Oppo supports this proposal.
  - LG thinks that the situation is different from duplication
  - Huawei thinks this is a similar issue due to restriction
  - Vivo thinks the situation is different as the UE can't transmit on another Cell so we should follow LTE.
  - Ericsson indicates that there are some similar discussion in CP
  - LG thinks that for duplication if one RLC entity fails there is another RLC entity we can fall back on. In this case this would mean a protocol failure
- => LTE behaviour is follow for RLC failure in CA  
=> Noted

Not treated

R2-1710359 RLC TP for BSR Fujitsu discussion Rel-15 NR\_newRAT-Core  
R2-1711249 RLC PDU creation an SDU/PDU discard Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1711568 Clarification on Re-establishment procedure in NR RLC LG Electronics Inc. discussion  
Rel-15 NR\_newRAT-Core

### 10.3.3 PDCP

#### 10.3.3.1 TS

*Latest TS 38.323, rapporteur inputs, etc*

*Including output from email discussion [99#12][NR UP] – Running draft TS 38.323 – LG*

*Please provide input to the rapporteur for corrections. Single/combined rapporteur TP is encouraged.*

R2-1711575 PDCP specification updates LG Electronics Inc. (PDCP rapporteur) discussion Rel-15 NR\_newRAT-Core

- Nokia asks why we removed duplication. LG explains that it won't be in the December version as it is downprioritized.
- Nokia doesn't agree to remove duplication. LG thinks that the functionality is not complete. Nokia explains that we will not maintain two sets of specifications, one for correcting early drop and one for correcting everything.
- Fujitsu thinks we should add the definition of data volume calculation in RLC.

=> RLC rapporteur will add RLC Data volume in the RLC spec  
=> Agree to add PDCP Data Volume  
=> Keep the duplication and put a editors note that duplication is to be completed. No further optimization to the duplication.  
=> Noted

R2-1710903 NR PDCP COUNT length Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core  
=> In NR, the length of PDCP COUNT is 32-bits.  
=> Noted

R2-1710905 Text Proposal on PDCP Data Recovery procedure Samsung R&D Institute India discussion  
=> Not treated

- ☒ **[99bis#14][NR UP/PDCP] – Running TS 38.323 (LG)**  
Agreeable TS to be endorsed next meeting  
Deadline 3 weeks after the meeting

#### 10.3.3.2 PDCP PDU formats

*Contributions should focus only on critical issues/corrections related to agreed RLC PDU format (e.g. not enhancements)*

### 10.3.3.3 PDCP receive operation

*Including output from email discussion [99#36][NR UP] Out-of-order delivery in PDCP – LG*

*Contributions on how to capture the reassembly other than input from [99#36] are discouraged. Comments should be provided in email discussion. If an alternate TP is proposed, a converged, multi-company TP should be provided.*

- R2-1711577 Support for out-of-order delivery in PDCP LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core  
=> the TP is endorsed
- R2-1711470 Out-of-sequence delivery duplicate discard Sequans Communications, Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core  
- Samsung and LG doesn't see the need to have the note. It is an obvious behaviour.  
=> Noted
- R2-1711008 Discussion to avoid duplicate reordering in EN-DC Samsung R&D Institute India discussion Rel-15 R2-1709101  
Proposal 1: In EN-DC, when MCG DRB is configured with LTE RLC UM entity and NR PDCP configuration, then NR PDCP reordering should be disabled.  
- Huawei doesn't see the need for optimization  
- Oppo considers we can just set the value to zero and disable it.  
- LG acknowledges the problem but disabling can be handled by eNB configuration.  
=> Noted
- R2-1711593 Outdated and duplicated PDU handling Samsung discussion Rel-15 NR\_newRAT-Core R2-1709599  
Proposal 1: Outdated or duplicate PDCP PDUs are header decompressed if the header compression protocol is NC state in U-mode.  
- LG asks when this would happen. Samsung thinks it is in the case of re-establishment.  
=> Noted
- R2-1711673 Handling of COUNT wrap around Sequans Communications discussion Rel-15 NR\_newRAT-Core  
Proposal 1: PDCP receive procedure should not assume COUNT wrap around is not possible  
- LG thinks we agreed in main session its not possible.  
=> Noted

=> We will update the note "when performing comparison of values related to COUNT, the UE takes into account that COUNT is a 32-bit value, which may wrap around (e.g., COUNT value of 232 - 1 is less than COUNT value of 0)." So that it doesn't state the Count may wrap around.

### 10.3.3.4 UL data split

*Capture UE requirements or restriction on bad UE behaviour related to pre-processing (max 1 contribution per company – multi-company proposals encouraged)*

- R2-1710635 Restriction on UE pre-processing Intel Corporation discussion Rel-15 NR\_newRAT-Core  
Proposal 2: There is no specified restriction on the amount of pre-processing the UE can perform. It is sufficient to specify that there are no gaps in RLC SNs.  
=> Noted
- R2-1711039 Pre-processing for UL split bearer operation Lenovo, Motorola Mobility discussion Rel-15 NR\_newRAT-Core  
Proposal 1: The amount of pre-processed data should be limited, i.e. the amount of data of RLC PDUs pending for initial transmission should be limited.  
- Oppo asks if this is for all bearers or split bearer. Lenovo thinks it is for all bearers

- => Noted
- R2-1711246 PDCP pre-processing and data delivery to lower layers Ericsson discussion Rel-15 NR\_newRAT-Core
- Intel asks how the UE can close the gap.
  - Lenovo asks if the timer would be configured by the network. Ericsson thinks we can hard code it, for example to 5ms.
- => Noted
- R2-1710778 Remaining issues of pre-processing for UL split bearer Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- => Noted
- R2-1711578 Need for pre-processing limit LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core
- => Noted
- R2-1711654 Pre-processing limit for split bearers Sequans Communications discussion Rel-15 NR\_newRAT-Core
- => Noted
- R2-1710698 Pre-processing and uplink data split MediaTek Inc., Qualcomm Inc. discussion Rel-15 NR\_newRAT-Core
- => Noted

What do we do???

1. Nothing – just a note
  2. *The amount of pre-processed data should be limited*
    - *configurable maximum amount of pre-processed data allowed*
    - *Specified as a NOTE, submission of PDCP PDUs to lower layer RLC (for the purpose of pre-processing) is allowed under the condition that a potentially introduced transmission gap among the UL paths is closed within a specified time threshold.*
- Mediatek thinks we should add just one note
  - Ericsson would like the solution to be testable, for example testing that no data gets stuck in the second PDCP leg. Mediatek doesn't think this is testable anyways as this is UE implementation. Ericsson thinks that we have to ensure that data stuck in one leg gets re-processed. LG agrees with this problem but we can add a note to warn the UE so UEs don't pre-processes.
  - CATT asks what's more important the amount of data or time. Mediatek thinks UL split is used for higher data rate, so data is more important.
  - Intel doesn't think that data will be stuck in one leg. Data recovery can take care of the retransmissions at the PDCP. Qualcomm agrees with Intel and doesn't see how we can test. Ericsson doesn't think the network should be forced to stop the split bearer and it destroys the purpose of split bearer. Huawei thinks that this would mainly happen when the link is bad anyways.

*For comparison with the PDCP split threshold, beside PDCP data volume, also all pre-processed data that has not yet been transmitted on RLC should be considered.*

- Lenovo and Ericsson thinks that we should include. Vivo thinks that the data in the RLC will be considered anyways. Lenovo thinks that for BSR is no impact but we are talking about the threshold.
- Nokia asks what happens when you go below the threshold, do your report in the prioritized leg and what do you do with the pre-processed data in the non-prioritized leg, do you re-process them????
- Mediatek doesn't see a problem with the BSR.
- Oppo asks how to handle the case where you switch to single path and you have pre-processed data. CATT agrees and we should minimize.
- Samsung agrees that when comparing to the threshold both PDCP data volume and pre-processed data is taken into account. But we can leave it up to UE implementation how the UE handles the pre-processed data if the data value is below the threshold.

- LG and Qualcomm thinks that the problem may be minor. Qualcomm asks if we would include the retransmission data. Huawei agrees and it should apply to both routing and data reporting.
- Lenovo explains that the behaviour would result the same as LTE, we would have to consider PDCP data volume + RLC pre-processed data.
- Oppo has another solution where the UE can only pre-process in certain conditions, for example only on the prioritized leg
- Nokia is concerned that if the UE switches to single path, it shouldn't report the pre-processed data of the second leg in the BSR.
- Ericsson is concerned with agreement 1. and this leads to having no test case.

<p>Agreement</p> <ol style="list-style-type: none"> <li>1 A note to provide guidance to the UE will be added (e.g. the UE should minimize transmission gap among the UL split bearer)</li> <li>2 When comparing with the PDCP split threshold the UE should take into account the PDCP data volume and RLC pre-processed data (e.g. pending data for transmission). This is will be added in normative text.</li> <li>3 FFS if there is any issue on BSR reporting on the secondary leg.</li> </ol>
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- ☒ **[99bis#44][NR UP – PDCP] – TP for PDCP pre-processing (LG)**
- Capture agreements on PDCP pre-processing for UL data
- Outcome: Agreeable TP for next meeting
- Deadline: Thursday 2017-11-09

- R2-1711037 Threshold for NR UL split bearer Lenovo, Motorola Mobility, Sequans Communications  
discussion Rel-15 NR\_newRAT-Core  
=> Not treated
- R2-1711730 Threshold for UL split LG Electronics UK discussion NR\_newRAT-Core R2-1709656  
=> Noted
- R2-1711545 Supporting UL single path transmission in PDCP Qualcomm Incorporated, MediaTek Inc., Broadcom discussion Rel-15 NR\_newRAT-Core
- LG thinks “ul-DataSplitThreshold is not configured” depends on the RRC signaling. Qualcomm explains that the RRC signalling being discuss includes this “no configuration”
  - Lenovo asks what happens to the data in the other leg.
- => The rapporteur will capture the changes once the RRC signalling has been completed.  
=> Noted
- R2-1711620 UE triggered PDCP UL path change in DCNTT DOCOMO INC., NEC, Fujitsu discussion Rel-15 NR\_newRAT-Core
- LG, Oppo thinks that we don't this optimization as we already have retransmission in the RLC.
  - Nokia has some sympathy about the problem
- => Noted
- Not treated
- R2-1710143 Discussion on threshold for UL data split OPPO discussion Rel-15 NR\_newRAT-Core
- R2-1710308 Limiting UE pre-processing for split bearer CATT discussion Rel-15 NR\_newRAT-Core
- R2-1710360 Pre-processing restriction Fujitsu discussion Rel-15 NR\_newRAT-Core
- R2-1710780 Data volume reporting in NR PDCP Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1711270 Submission of PDCP PDUs to lower layers for UL split bearer Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT
- R2-1711547 PDCP uplink path switching MediaTek Inc. discussion Rel-15 NR\_newRAT-Core

R2-1711730	Threshold for UL split	LG Electronics UK	discussion	NR_newRAT-Core	R2-1709656
R2-1711787	NR UL Split Configuration	Samsung	discussion	Rel-15 NR_newRAT-Core	

### 10.3.3.5 PDCP duplication

*This AI will not be treated*

	Not treated				
R2-1710763	PDCP operation for packet duplication	Huawei, ASUSTek, HiSilicon	discussion	Rel-15 NR_newRAT-Core	R2-1707719
R2-1710764	PDCP data volume calculation for packet duplication	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	R2-1707720
R2-1710765	Clarification on bearer type for packet duplication	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	
R2-1710766	Enhancements for DL Packet Duplication	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	R2-1707715
R2-1710970	Layer-2 behaviors of PDCP duplication deactivation	vivo	discussion	Rel-15 NR_newRAT-Core	R2-1708508
R2-1711041	PDCP Packet Duplication	Lenovo, Motorola Mobility Core	discussion	Rel-15 NR_newRAT-Core	
R2-1711242	PDCP duplication and discard	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1711245	PDCP duplication transmit operation	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1711247	PDCP data volume reporting in duplication	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1711407	Data duplication in NR	MediaTek Inc.	discussion	Rel-15 NR_newRAT-Core	R2-1708098
R2-1711421	On deactivation of duplication in carrier aggregation	MediaTek Inc.	discussion	Rel-15 NR_newRAT-Core	
R2-1711544	PDCP duplication	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core	R2-1708951
R2-1711669	Configuration of PDCP duplication on default DRB	ITL	discussion	Rel-15 NR_newRAT-Core	
R2-1711782	Activation and Deactivation of PDCP Duplication	Samsung	discussion	Rel-15 NR_newRAT-Core	
R2-1711783	Discussion on CA Duplication	Samsung	discussion	Rel-15 NR_newRAT-Core	
R2-1711785	Initial State of Uplink Packet Duplication	Samsung	discussion	Rel-15 NR_newRAT-Core	

### 10.3.3.6 Support for RoHC

R2-1711610	Decompression failure upon PDCP re-establishment	Samsung	discussion	Rel-15 NR_newRAT-Core	
	<p>Proposal: Upon PDCP re-establishment, if drb-ContinueROHC is not configured, the receiving PDCP entity performs header decompression for stored PDCP PDUs before header decompression reset.</p> <ul style="list-style-type: none"> <li>- Samsung thinks the inter-gNB case is a problem and it is a problem for RLC AM and UM</li> <li>- Oppo agrees that this should be solved.</li> <li>- LG thinks that for UM we agreed to deliver stored packets to upper layer.</li> <li>- Docomo, Ericsson agrees</li> </ul> <p>=&gt; Noted</p>				
R2-1711554	Discussion on PDCP re-establishment	LG Electronics France	discussion	Rel-15 NR_newRAT-Core	

=> Noted

R2-1710967 RoHC support of EN-DC vivo,CATR discussion  
 - Samsung is concerned about AM. If ROHC continue is configured you have to wait for the packets to be re-ordered before decompression.  
 => Noted

R2-1710636 Asymmetric ROHC in NR Intel Corporation discussion Rel-15 NR\_newRAT-Core  
 Proposal 1: UL only ROHC for TCP/IP profile is supported in NR.  
 Proposal 3: All ROHC profiles can be configured with UL only ROHC  
 - Docom doesn't want to have this flexibility

Proposal 4: UE capability signalling should allow the indication of per ROHC profile support of UL only, DL only, or bidirectional support of ROHC operation.  
 - Docomo doesn't think asymmetric ROHC. Intel thinks because data rate is much larger there is a need to support UL only  
 - Huawei thinks that UL only ROHC should be supported.  
 - LG doesn't see a strong need to support it. QC sees a need for UL ROHC  
 => Noted

R2-1710779 Remaining issues for RoHC in NR PDCP Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

Proposal 3: RoHC should be supported at least for UM split bearer in EN-DC and NR-DC.  
 - Mediatek wonders if there is a use case.  
 - Ericsson thinks that RoHC comes for free. Vivo agrees with Ericsson.  
 - LG needs to check the impact to the current specification.  
 Proposal 4: If a MCG or SCG bearer is reconfigured from unified split bearer, RoHC should be configured.  
 => Noted

Agreements

- 1 For AM DRBs, upon PDCP re-establishment, if drb-ContinueROHC is not configured, the receiving PDCP entity performs header decompression for stored PDCP PDUs before header decompression reset
- 2 For EN-DC, for RLC UM PDCP entity processes PDCP Data PDUs that are received from lower layers due to the re-establishment of the lower layers, at PDCP re-establishment.
- 3 UL only ROHC for TCP/IP profile is supported in NR as in LTE

Not treated

R2-1710142 Left issues on ROHC in PDCP operation OPPO discussion Rel-15 NR\_newRAT-Core  
 R2-1710966 Discussion on the PDCP data volume vivo discussion R2-1708498  
 R2-1711732 Header compression in reflective QoS HTC Corporation discussion R2-1709375

10.3.3.7 Other

R2-1711576 TP on PDCP data volume calculation LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core

=> Update the first bullet to "for which no PDCP Data PDU has been constructed"  
 => The first part of the TP is agreeable and will be added to the rapporteur running TS  
 => Noted

R2-1711123 Discussion on PDCP data volume calculation Samsung R&D Institute India discussion R2-1708444  
 => Noted

R2-1710314 Consideration on UP integrity configuration ZTE Corporation discussion Rel-15 NR\_newRAT-Core

*Proposal 3: For each DRB, the enabling of integrity protection should be configured by RRC signaling semi-statically, and the enabling of integrity protection for one DRB can only be changed during HO procedure.*

- Vivo agrees. ZTE explains that if we only allow reconfiguration at HO procedure the dynamic pointer is not needed.
  - Qualcomm supports the proposal
  - Huawei asks why we say "only". ZTE thinks that this should prevent header mismatch. Qualcomm thinks that allowing other cases would introduce complexity, the UE would have to know when the new MAC-I header is there or not. For ciphering, HO procedure is used, the bearer is re-established and the UE knows exactly when new config applies. Ericsson confirms that it is not possible from the UP perspective to support a change without a HO procedure and no MAC-I header.
  - LG doesn't understand why the integrity protection change within the same gNB. Huawei thinks that this is related to the service.
- => Noted

**Agreements**

- 1 For each DRB, the enabling of integrity protection should be configured by RRC signaling semi-statically. The enabling of integrity protection for one DRB can only be changed using a HO procedure.
- 2 For the data plane PDCP PDU, the presence of MAC-I field can be derived based on the RRC configuration, thus no MAC-I presence indicator is needed. The current PDCP spec already implements this.

R2-1710781 Solutions for SN gap issue due to PDCP discard Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

When discarding a PDCP PDU, UE will keep its PDCP header and transmit a PDCP PDU with only this PDCP header.

Discussion on whether there is a problem to address:

- Qualcomm thinks that this is a problem to address. LG thinks we can handle this by UE implementation. Intel is concerned that if we add header we may make the congestion issue worst. Huawei thinks that if we don't include the payload it is better. Qualcomm doesn't think the congestion is necessarily the only problem.
- Samsung and Mediatek thinks we can trust the UE implementation.

=> we will leave it to UE implementation  
=> Noted

R2-1710906 SDAP header excluded from PDCP ciphering Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core

*The PDCP ciphering function shall not be applied to SDAP header*

- Mediatek and LG don't think this complexity is needed. We are violating the cross-layer principle. Nokia, Huawei agree.
- Intel support and for ROHC the UE should exclude it.

=> Noted

R2-1711146 PDCP operations during PDCP version change in EN-DC Samsung R&D Institute India discussion Rel-15

=> Not treated

R2-1711557 Discussion on data recovery procedure for UM DRBs LG Electronics France discussion Rel-15 NR\_newRAT-Core

Proposal 1 PDCP data recovery procedure is not defined for UM DRBs.

Proposal 2 If RAN2 supports PDCP data recovery for UM DRBs, the UM RLC entity provides transmission status indication, and the PDCP entity performs PDCP data recovery procedure based on the UM RLC entity indication.

- Sequans thinks is not complex. Samsung, Docomo don't see a motivation

=> Noted



=> PDCP data recovery procedure is not defined for UM DRBs.

R2-1711653 PDCP retransmissions upon UL path change & re-establishment discussion Rel-15 NR\_newRAT-Core Sequans Communications

=> Noted

Whether data recovery should be done in case of UL data path

- Mediatek, Lenovo thinks that if we switch data path then recovery should be supported.
- Samsung is concerned that this is internal to UE and we should avoid. LG agrees and if the UE switches path it can continue transmitting the RLC data in the path. Sequans thinks that if there is a problem it may take time to complete transmissions.
- Qualcomm thinks whether retransmission are allowed should be further discussed, but we don't need to send a PDCP status report.
- Mediatek thinks that this would alleviate some of the concerns from the network side, when the UE has pre-processed data in the second leg.
- Nokia also thinks that this should be allowed.
- CATT also supports having the UL data recovery and whether it configurable.

=> FFS on UE behaviour upon UL path switch (e.g. retransmissions and data recovery)

=> Noted

R2-1711735 Separate configurations for UL and DL PDCP SN lengths discussion Rel-15 NR\_newRAT-Core HTC Corporation R2-1709352

=> Not treated

R2-1710310 Remaining issues for duplication/split bearer discussion Rel-15 NR\_newRAT-Core CATT

=> Not treated

R2-1710309 Dynamic leg switching for split bearer discussion Rel-15 NR\_newRAT-Core CATT

=> MAC-CE based leg switching is not supported for split bearer in Rel-15

=> Noted

Not treated

R2-1710144 Left issues on PDCP operation for LTE RLC discussion Rel-15 NR\_newRAT-Core OPPO

R2-1711043 PDCP discard timer for NR discussion Rel-15 NR\_newRAT-Core Lenovo, Motorola Mobility

R2-1711044 PDCP discard discussion Rel-15 R2-1709177 Beijing Xiaomi Mobile Software

R2-1711241 PDCP SN reconfiguration at handover discussion Rel-15 NR\_newRAT-Core Ericsson

R2-1711243 UP timers in PDCP discussion Rel-15 NR\_newRAT-Core Ericsson

R2-1711271 PDCP trigger for uplink splitting discussion Rel-15 NR\_newRAT-Core Nokia, Nokia Shanghai Bell

R2-1711539 Resolving the SN-gap issue due to PDCP discard discussion Rel-15 NR\_newRAT-Core Qualcomm Incorporated, Fujitsu, Huawei, HiSilicon R2-1708947

R2-1711540 Further details on moving reordering window discussion Rel-15 NR\_newRAT-Core Qualcomm Incorporated R2-1708948

## 10.3.4 SDAP

### 10.3.4.1 TS

*Latest TS 37.324, rapporteur inputs, etc*

*Including output from email discussion [99#13][NR UP] – Running draft TS 37.324 – Huawei*

*Please provide input to the rapporteur for corrections. Single/combined rapporteur TP is encouraged.*

R2-1711552 TS 37.324 v101 Rapporteur (Huawei) draft TSRel-15 37.324 1.0.1 NR\_newRAT-Core  
 => Change start of section 5.3.2 "For each received DL SDAP PDU of the QoS flow with RQI set to 1, the SDAP entity shall"  
 => The TS is endorsed with the changes above in R2-1711866 v1.1.0

Not treated

R2-1710068	Text proposal for the SDAP entity establishment and release Rel-15 NR_newRAT	Samsung	discussion	
R2-1710069	Text proposal on the number of SDAP entities for DC operation Rel-15	Samsung	discussion	
R2-1710225	Number of SDAP Entities for NR DC NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15

### 10.3.4.2 Header Format

*Details of header format only (e.g. size of QFI and use of one bit QFI). Progress on some aspects may require SA2 response.*

R2-1710351 Discussion on single bit RQI OPPO discussion R2-1707780

- CATT thinks that as a consequence of the last agreements we can have option 3.
- Xiaomi thinks that we should first agree if AS and NAS should be independent in terms of operation. Samsung thinks that they are independent and one bit doesn't mean they are coupled. Xiaomi asks how the UE knows whether the RQI is for NAS and if it should start the timer. Samsung thinks that it can work. Nokia says that it was explained how it works in the LS to SA2.

=> We will wait for SA2 response  
 => Noted

Not treated

R2-1710070	Further considerations on the QoS header format NR_newRAT-Core	Samsung	discussion	Rel-15
R2-1711546	Reflective QoS	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1710702	Separating AS and NAS RQI fields Core	MediaTek Inc.	discussion	Rel-15 NR_newRAT-
R2-1710168	SDAP Header Format	TCL	discussion	Rel-15 NR_newRAT-Core
R2-1710226	Further Discussion on SDAP Header Format 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1710393	Shorter QFI in SDAP header	CMCC	discussion	Rel-15 NR_newRAT-Core
R2-1710394	Considerations on one bit RQI	CMCC, OPPO	discussion	Rel-15 NR_newRAT-Core
R2-1710439	Discussion on SDAP DATA PDU for reflective QoS discussion			Rel-15 ZTE Corporation, Sane Chips
R2-1711077	Presence of UL SDAP header on default DRB NR_newRAT-Core R2-1709055	ASUSTeK	discussion	Rel-15
R2-1711078	Discussion on changing presence of SDAP header NR_newRAT-Core	ASUSTeK	discussion	Rel-15
R2-1711236	SDAP entity establishment	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711237	SDAP Header Format	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711556	Location of QoS Flow ID in UL and DL packet 15 NR_newRAT-Core R2-1703023	LG Electronics France	discussion	Rel-
R2-1711755	SDAP header format	LG Electronics	discussion	NR_newRAT-Core

### 10.3.4.3 Other

*QoS flow remapping and handover within the same cell (max 1 contribution per company for this topic)*

*Other SDAP issues*

Not treated

R2-1711750	Discussion on default DRB establishment in DC Core R2-1709074	LG Electronics	discussion	NR_newRAT-
R2-1710166	Issues with RQI setting	TCL	discussion	NR_newRAT-Core
R2-1710167	QFI Presence for AS Level Reflective QoS	TCL	discussion	NR_newRAT-Core
R2-1710227	SDAP (re)configuration	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710228	QoS Flow to DRB Re-Mapping	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710229	Lossless Handover of QoS Flow	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710230	QoS Flow Level Offloading in NR-DC NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1710257	New QoS flow on the Default Bearer 15 NR_newRAT	Nokia, Nokia Shanghai Bell	discussion	Rel-15
R2-1710258	Reflective QoS Control	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1710259	QoS Flow Remapping	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1710260	Default QoS Profile	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1710311	How to update the mapping rule of reflective QoS	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710312	QoS re-mapping of QoS flow and DRB R2-1707939	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710353	QoS flow remapping	OPPO	discussion	
R2-1710438	Discussion on QoS flow-DRB remapping	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1710699	In-order delivery during QoS flow relocation NR_newRAT-Core R2-1708260	MediaTek Inc.	discussion	Rel-15
R2-1710969	Consideration on BSR for SDAP	vivo, Xiaomi, CATR	discussion	
R2-1711067	QoS Flow Remapping	Beijing Xiaomi Mobile Software	discussion	Rel-15 R2-1709179
R2-1711068	QoS Flow Remapping	Beijing Xiaomi Mobile Software	discussion	Rel-15 R2-1709179
R2-1711342	SDAP configuration aspects	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711543	SDAP remaining issues	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1711558	QoS flow to DRB remapping Core R2-1703086	LG Electronics France	discussion	Rel-15 NR_newRAT-Core
R2-1711668	Reflective QoS acknowledgement	ITL	discussion	Rel-15
R2-1711741	Configurability for the presence of SDAP header Core R2-1709068	LG Electronics	discussion	NR_newRAT-Core
R2-1711742	Configuration scenarios on whether or not a SDAP header is present discussion NR_newRAT-Core R2-1709071	LG Electronics	discussion	
R2-1711748	Considerations on release of a mapping of QoS flow to DRB NR_newRAT-Core	LG Electronics	discussion	
R2-1711811	SDAP configuration	LG Electronics	discussion	NR_newRAT-Core R2-1709089
R2-1711817	Reflective QoS operation	SHARP Corporation	discussion	Rel-15 NR_newRAT-Core

## 10.4 Stage 3 control plane

### 10.4.1 NR RRC

#### 10.4.1.1 TS

*Latest TS 38.331, other rapporteur inputs, etc. Please submit any new text proposals to the appropriate agenda item. Note specification methodology has been given a separate AI for RRC.*

*This agenda item is relevant to EN-DC completion.*

R2-1710557 TS 38.331 Ericsson draft TSRel-15 38.331 0.1.0 NR\_newRAT-Core R2-1708468  
=> Endorsed

#### 10.4.1.2 Specification methodology

*This agenda item is relevant to EN-DC completion.*

R2-1710117 Remaining issues on NR RRC methodology NTT DOCOMO, INC. discussion Rel-15 NR\_newRAT-Core

R2-1710118 Necessity of error handling on inter-node RRC message NTT DOCOMO, INC. discussion Rel-15 NR\_newRAT-Core

R2-1710539 Definitions and logic for need codes in NR ASN.1 Huawei, HiSilicon discussion Rel-15  
=> Revised in R2-1712004

R2-1712004 Definitions and logic for need codes in NR ASN.1 Huawei, HiSilicon, Nokia discussion Rel-15

R2-1711507 Specification improvements for NR RRC Samsung Telecommunications discussion Rel-15

Come back for outcome of offline session on specification methodology

R2-1712037 Offline session on RRC Methodology Ericsson  
=> Agreed

#### 10.4.1.3 Connection control procedures

*No documents should be submitted to 10.4.1.3. Please submit to 10.4.1.3.x.*

##### 10.4.1.3.1 Connection reconfiguration message structure

*Structure and general content of RRCConnectionReconfiguration message. Including the related additions to the LTE RRCConnectionReconfiguration for EN-DC operation.*

*Including output from email discussion [99#30][NR] RRC Connection Reconfiguration (Ericsson)*

*This agenda item is relevant to EN-DC completion.*

R2-1711532 Summary of email discussion #30 for RRCConnectionReconfiguration Ericsson discussion Rel-15  
=> Revised in R2-1711961

R2-1711961 Summary of email discussion #30 for RRCConnectionReconfiguration Ericsson discussion Rel-15  
P1

- Nokia think the implication that an update of the SN security must always go through the MN. Asks if SN can trigger security key change for one bearer. Ericsson think this will be possible if RAN3 supports the request from SN to MN.
- Ericsson think the key change in SN is not needed as handovers within SN can be done without key change so the only rare case is wrap around.

Agreements

- 1: Include SCG-Counter in LTE RRCConnectionReconfiguration. Rename this to SK-counter.
  - 2 Indicate explicitly or implicitly at the RadioBearerConfig level if the bearers in this container are using KeNB or S-KgNB (one indication per RadioBearerConfig container and not one per bearer)
  - 3 Adopt following signalling solution for algorithms: a) Algorithms for the bearers using KeNB and LTE PDCP: use securityConfigHO, b) Algorithms for the bearers using KeNB and NR PDCP: use new signalling in RadioBearerConfig (however, the algorithm should be same as in securityConfigHO) and c) Algorithms for the bearers using S-KgNB and NR PDCP: use new signalling in RadioBearerConfig. New signalling applies to all bearers in RadioBearerConfig.
  - 3i Case a and b can configure LTE algorithms, and case c can configure NR algorithms (This is for Rel-15 and may be re-discussed in future releases)
  - 4 Introduce an explicit bit to indicate that PDCP is to be re-established (security key a change and PDCP re-establishment can be linked together in the field description)
  - 5 Introduce an explicit bit to indicate that RLC is to be re-established (to be used whenever MAC is reset).
- FFS: How to trigger the PDCP recovery actions given the agreement 5 to be checked
- 6 For SCG change scenario and S-KgNB change scenario, signalling and L2 actions according to the TP plus agreements 4 and 5 are used. There is no need identified to specify "SCG change" procedure for the UE in NR RRC specification. (Implications on stage 2 description can be checked offline)
  - 7 Apply same signalling structure for SRBs and DRBs (including SRB3)

- |            |   |                   |                                  |
|------------|---|-------------------|----------------------------------|
| R2-1711533 | LTE and NR text proposal for RRCConnectionReconfiguration Rel-15  | Ericsson          | discussion                       |
|            | => To be updated based on agreements from email discussion #30.   |                   |                                  |
|            | => SN release aspect still to be discussed based on contribution.   |                   |                                  |
|            | => LTE RLC entity reset still to be discussed based on contribution.  |                   |                                  |
|            | => Location of UL scheduling information still open   |                   |                                  |
|            | => Can consider comments relating on forward compatibility to other architecture options.   |                   |                                  |
|            | => Should identify aspects that are not applicable to EN-DC   |                   |                                  |
|            | => Can clarify (e.g., in field description) fields that are only applicable to EN-DC and won't be applicable to SA (e.g. EPS bearer ID)   |                   |                                  |
|            | => Revised in R2-1711967 (Offline discussion #25). Aim is that the TP will be included into the TS after Friday.  |                   |                                  |
| R2-1711967 | LTE and NR text proposal for RRCConnectionReconfiguration Rel-15  | Ericsson          | discussion                       |
|            | => Endorsed to be merged into the TS.   |                   |                                  |
| R2-1710509 | Signalling of security parameters   | Ericsson          | discussion Rel-15 NR_newRAT-Core |
|            | => Not treated. Covered by email discussion.  |                   |                                  |
| R2-1710616 | RRC signalling for SN release   | Intel Corporation | discussion Rel-15 NR_newRAT-Core |
|            | - Intel explain from the TP that the proposal is to do this from the SN side and SN builds the container to be carried by the MN, but think that final decision should be on the MN side. |                   |                                  |
|            | - Ericsson think the proposal could be justified to avoid the MN to have to construct the NR message in order to release the SCG.   |                   |                                  |
|            | - Ericsson thinks all the release fields are hidden in the NR PDU and it is not so nice to duplicate these outside the PDU as well.   |                   |                                  |

=> Offline discussion to conclude whether anything additional is needed for the SN release case.  
(Offline discussion #26, Intel)

R2-1712012 Offline Discussion#26: RRC signaling for SN release Intel Corporation discussion  
Rel-15 NR\_newRAT-Core

Agreements

- 1: MN provides an indication in the LTE RRCConnectionReconfiguration message to release the SCG configuration (e.g. SCellGroupRelease) to the UE
- 2: The UE needs to be explicitly signalled per SCG bearer in a Radio Bearer Configuration container whether SCG (split) bearer is released or changed to MCG bearer.
- 3: MN populates the radio bearer configuration to release the SCG bearer or change SCG bearer to MCG bearer.

R2-1711820 Explicit indicator to handle the LTE RLC entity in EN-DC Samsung R&D Institute India  
discussion Rel-15

- Ericsson wonder if on the LTE side it is possible to release and add the RLC entity, by releasing and adding the DRB, which is now the logical channel as PDCP has been extracted. Samsung think the text for this will become quite complex.
- Ericsson think that if mobility control info is used to trigger MAC reset then this will also re-establish RLC.
- Nokia think the procedures would be simpler and also aligned to NR if we add an RLC re-establish indicator.
- Huawei think it is important to have this indicator.

Agreements

- 1: For EN-DC, during SCG change scenario and bearer type change scenario, LTE RRC reconfiguration message has explicit indicator to re-establish the MCG RLC entity of split bearer.

R2-1710933 Discussion on the configuration of SDAP vivo discussion Rel-15 NR\_newRAT-Core  
R2-1708500

*moved from 10.4.1.3.2 to 10.4.1.2.1*

R2-1710510 Cell specific parameter handling in EN-DC Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1711137 Preserving NR PDCP version Ericsson discussion Rel-15 NR\_newRAT-Core

#### 10.4.1.3.2 Connection reconfiguration message - L2 parameters

*L2 parameter content of RRCConnectionReconfiguration message.*

*Including output from email discussion [99#23][NR] L2 Parameters (Huawei)*

*This agenda item is relevant to EN-DC completion.*

R2-1710587 L2 parameter content of RRCConnectionReconfiguration message Huawei (Rapporteur)  
discussion Rel-15 NR\_newRAT-Core

- => Location of UL scheduling information still open
- => Aim to complete the SDAP configuration as much as possible by Dec 17.
- => SDAP config per DRB configures the QoS flows of the PDU session which are mapped to it.
- => TP revised in R2-1711968 (Offline discussion #27). Aim is that the TP will be included into the TS after Friday.

R2-1711968 TP for L2 parameter contents Huawei (Rapporteur) pCR Rel-15 NR\_newRAT-Core  
=> Endorsed to be merged into the TS

- R2-1710615 SDAP configuration in RRC message Intel Corporation discussion Rel-15  
NR\_newRAT-Core
- Ericsson explain that in the case that SDAP is not configured then we instead have the EPS bearer ID. So we could have a choice between SDAP and EPS bearer ID depending on the core.
  - => No SDAP layer for EN-DC in the configuration signalling or in the user plane stack.

Late

- R2-1711809 Considerations on support of supplementary uplink frequency CMCC discussion Rel-15  
NR\_newRAT-Core

#### 10.4.1.3.3 Connection reconfiguration message - L1 parameters

*L1 parameter content of RRCConnectionReconfiguration message.*

*Including output from email discussion [99#22][NR] L1 parameters (Ericsson)*

*This agenda item is relevant to EN-DC completion.*

- R2-1711524 [RAN2-99#22] TP on L1 parameters for 38.331 Ericsson discussion Rel-15  
NR\_newRAT-Core
- => Add FFS to indicate that field naming needs to be finalised also considering input from UP session and RAN1
  - => Comments invited on any details (can either be addressing during this week or can be marked FFS if cannot be resolved). Attempt to capture the reason behind decisions for future reference.
  - => Revised in R2-1711969 (Offline discussion #28). Aim is that the TP will be included into the TS after Friday.
  - => Scope of email discussions for ongoing work to be confirmed on Friday.
- ☒ **[99bis#16][NR] TS 38.331 (Ericsson)**  
Phase 1 to merge TPs from this meeting (1 week)  
Phase 2 to continue to progress draft TS. (by Thursday 2017-11-09), addressing any aspects not specifically in the scope of another email (e.g. RRM, L2, L1 parameters). To include:
    - updating to capture agreements from this meeting
    - attempt to address identified FFS points
    - identify FFS points that need online discussion at next meeting
 Phase 3 to merge outcome of other email discussion into updated draft TS (as soon as possible after Thursday 2017-11-09)  
Intended outcome: TP (changes to draft TS) for next meeting  
Deadline: As soon as possible after Thursday 2017-11-09
  - ☒ **[99bis#17][NR] Reconfiguration and bearer handling (Ericsson)**  
After merge of TPs from this meeting in draft TS, continue to progress the L1 parameters ASN.1 and corresponding field descriptions and procedure text. To include:
    - updating to capture agreements from this meeting
    - attempt to address identified FFS points
    - identify FFS points that need online discussion at next meeting
 Intended outcome: TP (changes to draft TS) for next meeting  
Deadline: Thursday 2017-11-09
  - ☒ **[99bis18x][NR] L2 parameters in RRC (Huawei)**  
After merge of TPs from this meeting in draft TS, continue to progress the L2 parameters ASN.1 and corresponding field descriptions and procedure text. To include:
    - updating to capture agreements from this meeting
    - discuss required parameters and value ranges (starting point those in TP)
    - attempt to address identified FFS points
    - identify FFS points that need online discussion at next meeting
 Intended outcome: TP (changes to draft TS) for next meeting

Deadline: Thursday 2017-11-09

- ☒ **[99bis#19][NR] L1 parameters in RRC (Ericsson)**  
After merge of TPs from this meeting in draft TS, continue to progress the L1 parameters ASN.1 and corresponding field descriptions and procedure text. To include:
- updating to capture agreements from this meeting
  - updating to capture latest information from RAN1
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting  
Deadline: Thursday 2017-11-09

- ☒ **[99bis#20][NR] RRM (Ericsson)**  
After merge of TPs from this meeting in draft TS, continue to progress RRM, ASN.1 and corresponding field descriptions and procedure text. To include:
- updating to capture agreements from this meeting
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting  
Deadline: Thursday 2017-11-09

R2-1711969 [RAN2-99#22] TP on L1 parameters for 38.331 Ericsson discussion Rel-15  
NR\_newRAT-Core  
=> Endorsed. Can be merged into draft TS

R2-1711060 Multiband and variable RX/TX support and NS signaling in NR Nokia discussion Rel-15  
NR\_newRAT-Core  
=> Noted

#### 10.4.1.3.4 Connection control procedures for EN-DCs

*Stage 3 details related to SCG SRB, split SRB, etc.*

*This agenda item is relevant to EN-DC completion.*

##### SRB3

- R2-1710862 RRC Reconfiguration Message on SRB3 MediaTek Inc. discussion
- Huawei is ok with the principle but the details need some more discussion.
  - Qualcomm think that SRB3 could transmit the SCG change. Huawei think that SCG change or SN change would always involve the MN.
  - MediaTek think it is important for implementation that it is clear from RRC spec what the UE should expect over SRB3.
  - CATT think the UE should be able to receive any message over SRB1. What matters for the UE is what can be reconfigured over SRB3.

##### Agreements

- 1 Clarify in the spec which reconfigurations the UE must be able to handle when received via SRB3:
  - i/ the NR measurement configuration
  - ii/ NR MAC, RLC and PDCP configuration
  - iii/ NR physical layer reconfiguration. The physical layer reconfiguration includes the modification of physical parameters used by PSCell or SCell(s). It also includes add/release of NR SCell(s).
  - iv/ NR RLF Timer and Constants
  - v/ PSCell change that doesn't impact MNFFS: Which PSCell change without security key change will involve the MN



R2-1710618 Possible reconfiguration over SCG SRB or SBR3 Intel Corporation discussion Rel-15 NR\_newRAT-Core  
 => Not treated as covered by previous paper.

R2-1710622 Further details on SRB3 handling Intel Corporation discussion Rel-15 NR\_newRAT-Core  
 => Noted

R2-1710623 TP for introduction of SRB3 in 38.331 Intel Corporation discussion Rel-15 NR\_newRAT-Core

*Default configs*

R2-1710278 Specified and default configurations for SRB3 and SRB1S SRB2S CATT discussion Rel-15 NR\_newRAT-Core

Agreements  
 1: The LCID of SRB1S/SRB2S should be the same with that of NR SRB1/SRB2 which can be 1/2 to align with the SRB ID. The LCID of the SRB3 should be 3.  
 2: The default configurations of SRB1S/SRB2S should be the same with that of NR SRB1/SRB2. The default configurations of NR SRB1 and SRB2 should be same except for the priority. The default configurations of the SRB3 should be the same with that of SRB1S.

R2-1711098 Default configuration of SRB1S and SRB2S in NR side for EN-DC Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

*PDCP version for SRB1/2*

R2-1711773 PDCP version for SRB1 and SRB2 Samsung Electronics GmbH discussion  
 - Intel wonder if the intent is to only split one of the SRBs. Samsung explain this is mainly just for simplification.  
 - Qualcomm doesn't see any value in the flexibility.

Agreement  
 1: Same PDCP version is configured for SRB1 and SRB2

R2-1710511 PDCP version for SRB1&2 Ericsson discussion Rel-15 NR\_newRAT-Core

*Other*

R2-1711530 RRC processing delays in NR and EN-DC Ericsson discussion Rel-15 NR\_newRAT-Core  
 - Vodafone support the proposal to shorten processing times.  
 - Intel think that the coordination between the 2 sides on the UE may result in a longer processing time than LTE today.  
 - Ericsson think the combined procedure should not be more than 15ms, preferably shorter.

☒ **[99bis#21][NR] RRC reconfiguration processing time for EN-DC (Ericsson)**  
 To discuss the processing times for EN-DC and for some applicable cases in NR. Includes processing times for messages via SRB1 with embedded NR message and messages via SRB3. Processing times are for EN-DC capable UEs and not for LTE only UEs.  
 Intended outcome: Report to next meeting  
 Deadline: Thursday 2017-11-09

- |            |   |                          |            |      |
|------------|---|--------------------------|------------|------|
| R2-1710617 | UE handling of combined configuration messages<br>15 NR_newRAT-Core<br><i>moved from 10.4.1.3.1 to 10.4.1.3.4</i> | Intel Corporation        | discussion | Rel- |
| R2-1711053 | SIB acquisition in connected mode and handover with BWP<br>15 NR_newRAT-Core                                      | Nokia                    | discussion | Rel- |
| R2-1711774 | Control of UL Split or Duplicate MCG SRB<br>1709163   | Samsung Electronics GmbH | discussion | R2-  |

#### 10.4.1.3.5 Connection control message harmonisation

*Harmonisation/merging of messages to be used for different procedures, UE identity and other message content to be used in different cases, etc.*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

*Maximum 1 tdoc per company*

- |            |   |                            |            |                   |
|------------|---|----------------------------|------------|-------------------|
| R2-1711486 | Harmonization of the RRC procedures<br>15 NR_newRAT-Core R2-1709220                               | Nokia, Nokia Shanghai Bell | discussion | Rel-              |
| R2-1710093 | Further discussion on merging NR RRC messages<br>NR_newRAT-Core                                   | Samsung                    | discussion | Rel-15            |
| R2-1710279 | RRC connection re-establishment and resume procedures in NR<br>15 NR_newRAT-Core R2-1707896       | CATT                       | discussion | Rel-              |
| R2-1710593 | NR common RRC procedures<br>Core R2-1708800   | Intel Corporation          | discussion | Rel-15 NR_newRAT- |
| R2-1710670 | Harmonization of Connection Control Procedures and Messages<br>Rel-15 NR_newRAT-Core              | InterDigital               | discussion |                   |
| R2-1710822 | Open issues for connection control  | Qualcomm Incorporated      | discussion | R2-1709636        |
| R2-1710826 | Harmonizing RRC Connection control messages and procedures<br>Rel-15 NR_newRAT-Core               | Ericsson                   | discussion |                   |
| R2-1711071 | Harmonization of RRC Connection Control management procedures<br>discussion Rel-15 NR_newRAT-Core | Huawei, HiSilicon          |            |                   |
| R2-1711150 | Simplification of RRC messages for NR<br>NR_newRAT-Core R2-1709113                                | LG Electronics France      | discussion | Rel-15            |
| R2-1711747 | Harmonization of the RRC connection management procedures<br>discussion Rel-15                    | NTT DOCOMO INC.            |            |                   |

*Late*

- |            |  |  |  |  |
|------------|--|--|--|--|
| R2-1711480 | Discussion on additional enhancement for INACTIVE to IDLE state transition procedure<br>OPPO discussion R2-1707084 |  |  |  |
|------------|--|--|--|--|

#### 10.4.1.3.6 Connection control email

*Output from email discussion [99#29][NR] Connection Control (Intel)*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

*Maximum 1 tdoc per company*

- |            |   |                   |  |  |
|------------|---|-------------------|--|--|
| R2-1710594 | Email discussion report on [99#29][NR] Connection Control<br>discussion Rel-15 NR_newRAT-Core<br>=> Revised to R2-1711839 | Intel Corporation |  |  |
| R2-1711839 | Email discussion report on [99#29][NR] Connection Control<br>discussion Rel-15 NR_newRAT-Core                             | Intel Corporation |  |  |

Show of hands:

- 1 - A UE in INACTIVE, trying to resume the RRC connection, cannot receive MSG4 sent over SRB1 with at least integrity protection to move the UE into IDLE. [7]
- 2- A UE in INACTIVE, trying to resume the RRC connection, can receive MSG4 sent over SRB1 with at least integrity protection to move the UE into IDLE. [10]

Show of hands:

- 1 - A UE in INACTIVE, trying to resume the RRC connection, cannot receive MSG4 sent over SRB0 without integrity protection to move the UE into IDLE.[11]
- 2- A UE in INACTIVE, trying to resume the RRC connection, can receive MSG4 sent over SRB0 without integrity protection to move the UE into IDLE.[9]

Agreements	
1	A UE in INACTIVE, trying to resume an RRC connection, can receive MSG4 sent over SRB0 (without Integrity protection) to move the UE back into INACTIVE (i.e. rejected with wait timer).
2	INACTIVE related parameters/configuration should not be updated by a MSG4 sent over SRB0 (as it is a non-protected message).
3	A UE in INACTIVE, trying to resume an RRC connection, can receive MSG4 sent over SRB1 with at least integrity protection to move the UE back into INACTIVE (i.e. not rejected). (RNA update use case)
4	The MSG4 (i.e. not rejected) of agreement 3 can configure at least the same parameters as can be configured by the message that moves the UE to inactive (e.g. I-RNTI, RNA, RAN DRX cycle, periodic RNAU timer, redirect carrier frequency, for inactive mode mobility control information or reselection priority information). (security framework are to be discussed independently)
5	A UE in INACTIVE, trying to resume the RRC connection, can receive MSG4 sent over SRB1 with at least integrity protection to move the UE into IDLE.
5.1	This MSG4 (i.e. SRB1 release to IDLE) can carry same information as RRC Connection release kind of message (e.g. priority, redirect information, idle mode mobility control information, cause and idle mode re-selection information).
6	UE in INACTIVE, trying to resume an RRC connection, cannot receive MSG4 sent over SRB0 (without Integrity protection) to move the UE into IDLE to stay in IDLE (i.e. not precluding use of fallback to RRC Connection Establishment).

=> Send an LS to SA3 to check whether there is any security concern with proposal 1 and 2 e.g. due to DoS attach (i.e. rejection to INACTIVE by a fake gNB multiple successive times, and/or with long wait time) and replay attack (i.e. UE transmitting the same MAC-I multiple times). Can check is similar question was asked in relation to light connection and if so then reference the previous LS. Draft LS in R2-1712019 (Offline discussion #49, Intel)

R2-1712019	[DRAFT] LS on security during Resume reject in INACTIVE state in NR	Intel	LS out	Rel-15
	NR_newRAT-Core To:SA3			
	=> Approved in R2-1712052			
R2-1710240	Discussion on Left Issues for RRC State Transitions	OPPO	discussion	
R2-1710280	Open Issues on Connection Control Procedure	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710638	[DRAFT] LS on security handling of MSG4 during INACTIVE to CONNECTED transition	Intel Corporation	LS-out	Rel-15 NR_newRAT-Core
R2-1710680	Open Issues on Email Discussion and Draft LS to SA3	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1710934	Remaining FFS Issues on RRC Connection Control	vivo	discussion	Rel-15 NR_newRAT-Core
R2-1711484	RRC Reject on SRB0	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core
R2-1711664	Remaining issues of RRC connection control from INACTIVE	Samsung Electronics	discussion	Rel-15

Withdrawn

R2-1710681 Draft LS to SA3 on Connection Control InterDigital discussion Rel-15 NR\_newRAT-Core  
Core Withdrawn

#### 10.4.1.3.7 Other (for non EN-DC)

*Other aspects of connection control procedures, state transitions, etc that are not relevant for EN-DC (other aspects relevant for EN-DC should be submitted to 10.4.1.3.2)*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710199 Size of MSG3 in NR Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1710200 Draft LS on MSG3 size Ericsson LS out Rel-15 NR\_newRAT-Core  
R2-1710235 Discussion on Batch Release of INACTIVE UEs OPPO discussion  
R2-1710313 Consideration on the relation between access categories and establishment causes CATT  
discussion Rel-15 NR\_newRAT-Core  
R2-1710569 Remaining issues on State transition between RRC CONNECTED and INACTIVE Huawei,  
HiSilicon discussion Rel-15 NR\_newRAT-Core  
R2-1710570 Timer based state transmission from CONNECTED to inactive Huawei, HiSilicon  
discussion Rel-15 NR\_newRAT-Core  
R2-1710666 Open Issues on Connection Control Procedures InterDigital discussion Rel-15  
NR\_newRAT-Core  
R2-1710671 Timer-based Inactivation for NR InterDigital discussion Rel-15 NR\_newRAT-Core  
R2-1708740  
R2-1710832 TP to 38.331 on RRC states Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1710833 Text proposal to RRC connection control Ericsson discussion Rel-15 NR\_newRAT-  
Core  
R2-1711019 UE capability in NR RRC connection request Sony discussion Rel-15 NR\_newRAT-  
Core R2-1709507 Withdrawn  
R2-1711023 RAN sharing and user plane integrity check Sony discussion Rel-15 NR\_newRAT-  
Core  
R2-1711035 Consideration on the triggers of transiting UE from INACTIVE to IDLE Beijing Xiaomi Mobile  
Software discussion Rel-15 R2-1709169  
R2-1711072 UE behaviour upon leaving RRC\_CONNECTED state Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core  
R2-1711076 State transition from RRC\_CONNECTED to RRC\_INACTIVE ASUSTeK discussion  
Rel-15 NR\_newRAT-Core R2-1709058  
R2-1711101 Consideration on RRC connection establishment procedure Huawei, HiSilicon  
discussion Rel-15 NR\_newRAT-Core  
R2-1711102 Draft LS to RAN1 on MSG3 size Huawei, HiSilicon LS out Rel-15 NR\_newRAT-Core  
R2-1711103 RRC Establishment Cause Huawei, HiSilicon discussion Rel-15 NR\_newRAT-  
Core R2-1708406  
R2-1711104 RRC Support of Multiple Numerologies Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core  
R2-1711200 RAN2 impact of non-contiguous CA Samsung discussion Rel-15  
R2-1711201 Draft reply LS to RAN1 on non-contiguous CA Samsung LS out Rel-15  
R2-1711384 Configurable cause for NR LG Electronics Inc. discussion Rel-15 NR\_newRAT-  
Core R2-1708457  
R2-1711410 SN continuation on MN failure in EN-DC operation Samsung R&D Institute UK discussion  
R2-1711458 NR RRC connection request Sony discussion Rel-15 NR\_newRAT-Core

R2-1711483	RRC connection release and inactivation procedures discussion Rel-15 NR_newRAT-Core	Nokia, Nokia Shanghai Bell		
R2-1711506	Capturing SA related agreements in 38.331 Rel-15	Samsung Telecommunications	discussion	
R2-1711513	Enhance RRC configuration procedure in NR 15 NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-
R2-1711515	Open issues on security aspects for NR RRC connection control discussion Rel-15 NR_newRAT-Core	Qualcomm Incorporated		
R2-1711623	Considerations on Establishment cause for NR 15 R2-1709655	KDDI Corporation	discussion	Rel-
R2-1711797	Information to include within RRC Activation and Inactivation discussion Rel-15 NR_newRAT-Core	Samsung Electronics		
		R2-1709570		

#### 10.4.1.4 RRM measurements

*No documents should be submitted to 10.4.1.4. Please submit to 10.4.1.4.x.*

##### 10.4.1.4.1 RRM TP

*Including output from email discussion [99#32][NR] TP on RRM (Ericsson)*

*0 tdoc per company (i.e. email discussion output from rapporteur only in this AI)*

*This agenda item is relevant to EN-DC completion*

R2-1710839	Summary of email discussion [99#32][NR] TP on RRM 15 NR_newRAT-Core	Ericsson	discussion	Rel-
R2-1711963	Summary of email discussion [99#32][NR] TP on RRM 15 NR_newRAT-Core	Ericsson	discussion	Rel-

#### Agreements

- 1: Measurement configuration can be provided in RRCConnectionReconfiguration and in RRCConnectionResume (or, as highlighted by 3 companies, an equivalent message from network to the UE used to resume the RRC connection from RRC\_INACTIVE to RRC\_CONNECTED).
- 2: In Rel-15, the only inter-RAT measurements that can be configured are E-UTRA measurements.
- 3: As in LTE, Measurement configuration is used for CGI reporting. The ASN.1 structure is FFS (after December).
- 4: Network can configure the RS type for s-Measure.  
FFS AllowInterruptions.  
FFS speed-based TTT scaling (to be discussed after December)  
FFS alternativeTimeToTrigger (to be discussed after December)
- 5 The UE shall perform RSRP, RSRQ measurements for each serving cell. FFS whether SINR is always measured on serving cells or is configured by the network.
- 6 One RS type for serving cell measurement reporting and neighbour cell measurement reporting is configured in one reporting config.
- 7 Configuration of ue-RxTxTimeDiffPeriodical is not supported in Rel-15.  
FFS Support T312 timer. (to be discussed after December)  
FFS Support SSTD measurement configuration via NR. (to be discussed after December)
- 8: Measurement reporting shall only be initiated after successful security activation
- 9 Network can configure the UE to report the best neighbour cells in the serving frequencies.  
FFS: Network can configure the UE with different filter coefficients per measurement quantity (e.g. RSRP, RSRQ, SINR or equivalent quantities as defined by RAN1/RAN4), RS Type and beam/cell measurements.

=> Offline discussion to attempt to conclude the terminology to be used for 'beams' e.g. SS/PBCH block index and CSI-RS index. Aim is that at the end of this meeting we have

some terminology on which to move forward, even if this is not the final terminology. (Offline discussion #29, Huawei)

- R2-1712020 Summary of offline discussion #29: Terminology for beam Huawei (rapporteur)
- => Merge the TP into the RRM TP using the term beam.
  - => Add a definition of the term 'beam' within the scope of RAN2 specs
  - => Add a note that we will align this definition when RAN1/4 have stabilised their terminology.
- => Offline discussion to progress the FFS on filter coefficients. (Offline discussion #30, MediaTek)
- Update from offline: Different filter coeffs can be configured for different measurement quantities and for different RS type and also for cell and beam reporting. 2 sets of coefficient can be configured in the quantity config and which one to be used is per frequency.
  - Samsung is not sure whether there is a problem to just use a single set of coefficients.
  - Ericsson think if there is a problem then it would be cleaner if the coeff was in the MO.
  - Nokia prefer to have the 2 coefficient should be set and give the network freedom to configure per measurement, not in the MO.
- R2-1710840 Initial ASN.1 TP on RRM Ericsson discussion Rel-15 NR\_newRAT-Core
- => Comments are invited to be provided offline to be either addressed during this week or to be captured as an FFS requiring more discussion.
  - => Merge in the procedures TP that was previously agreed and align field names, etc
  - => Revised in R2-1711971 (Offline discussion #31). Aim is that the TP will be included into the TS after Friday.
- R2-1711971 Initial ASN.1 TP on RRM Ericsson discussion Rel-15 NR\_newRAT-Core
- => Structure and details can continue to be discussed via the RRM email discussion after it is merged into the draft TS
  - => Endorsed to be merged into the draft TS.
- R2-1712021 Reminder on reporting of beam level trigger quantities in NR Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1712024 Beam measurement quantity reporting Intel discussion Rel-15 NR\_newRAT-Core

Proposal: Report only ONE quantity (configurable from RSRP, RSRQ or SINR) for beam measurement

☒ **[99bis#22][NR] Filter coefficients (MediaTek)**

Discuss the configuration flexibility available to the network in configuring different filter coefficients and reporting quantities for beam measurements. Needs to discuss the scale of the problem, where the complexity lies, and potential solutions. Can consider the proposal for 2 coefficients in the quantity config.

Outcome of the discussion could be a draft LS to RAN4 for approval on the first day of the next meeting.

Intended outcome: Report and possible LS to the next meeting.

Deadline: Thursday 2017-11-09

#### 10.4.1.4.2 Measurement report content

*Continue to progress the details of the measurement report content.*

*This agenda item is relevant to EN-DC completion*

*Maximum 1 tdoc per company*

- R2-1710571 Remaining issues on Measurement reporting Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

- MediaTek has some concern as the SSB and CSI-RS may have different periods and hence it is not clear what the UE does.

Agreements

- 1: A single periodical measurement configuration can be configured to report SS based measured results or CSI-RS based measured results (not both).
- 2 the UE is required to report all applicable cell up to maxCellReport for periodical measurement, where the applicable cells are defined as any neighbour cells detected on the associated frequency except for the cell in black cell list

R2-1710845 Open issues related to the contents of measurement report Rel-15 NR\_newRAT-Core Ericsson discussion

=> Offline to look at text in TP and conclude whether RS type for serving cell measurements should be configurable. Also look at agreement 6 from discussion of R2-1711963 to see if it needs to be reworded.(Offline discussion #39, Ericsson). In R2-1712047

Agreements:

- 1 The beam level information (beam IDs and/or available measurements results) of PCell/PSCell and SCell is included in the measurement report if the network has configured the UE to do so.

R2-1712047 Summary of Offline #39: configurability of NR serving cell measurements Ericsson

Agreements

- 1 An MO is provided to the UE for all carriers on which measurements are to be performed (as in LTE)
- 2 The following text is clarification of agreement 6 from discussion of R2-1711963
  - The information provided in reportConfig(s) is used to derive serving cell measurements;
  - UE derives what to measure for serving cells using the RS type(s) as identified in the different reportConfig(s);
  - UE performs serving cell measurements, even if a serving frequency MO is not linked to any reportConfig/measID;
  - As in LTE, UE performs serving cell measurements for all serving frequencies for all measurement quantities (RSRP and RSRQ. FFS SINR);
  - If a measurement report is triggered, associated to any measurement ID, the UE includes all available measurement results for PCell and configured SCells.

R2-1710281 Considerations on measurement reporting related to serving cells Rel-15 NR\_newRAT-Core R2-1707901 CATT discussion

R2-1710433 Remaining issues on measurement report content Rel-15 ZTE Corporation, Sane Chips discussion

R2-1710514 Reporting both NR-SS and CSI-RS in the measurement report Rel-15 PANASONIC R&D Center Germany discussion

R2-1711062 How to report beams, neighbour and serving cells Rel-15 NR\_newRAT-Core Nokia discussion

#### 10.4.1.4.3 Measurement configuration

*Continue to progress the details of the measurement report configuration.*

*Including output from email discussion [99#31][NR] Additional information for SSB and CSI-RS config (Ericsson)*

*This agenda item is relevant to EN-DC completion*

*Maximum 1 tdoc per company*

R2-1711336 Email discussion #31: Additional information for SSB and CSI-RS config discussion Rel-15 NR\_newRAT-Core Ericsson

- Samsung wonder why the second timing configuration is needed although understand that RAN1 agreed to have 2. Can't UE just measure on the longer periodicity and how does UE compare cells of different periodicity.
- Ericsson think that if the network knows that periodicity is different for some cells then the time to acquire those could be shorter.
- Intel understand the RAN1 agreement was a single SMTC for the inter-frequency case and 2 SMTC for intra-frequency case. Ericsson have the same understanding and think this would be captured in the field description.

=> TP to be updated based on agreements and FFS from this meeting.  
=> Coding of the 2 SMTC configuration options can be considered offline.  
=> TP revised in R2-1711989 (Offline discussion #40)

R2-1711989 OFFLINE#40 Additional information for SSB and CSI-RS config (Ericsson) Ericsson pCR

=> Discussion of structure can be continued after merge into TS and in comparison with the CSI resources in the L1 parameters TP.  
=> Endorsed to be merged into the TS.

R2-1710935 Measurement configuration for measurement object NR\_newRAT-Core vivo discussion Rel-15

Agreements  
1 cellIndividualOffset in MO is enough, no need for the cell offset in report configuration.

FFS How MO can be used in the case of a location of the SSB is distant in frequency from the CSI-RS resources to be measures. (e.g. is it possible to configure an MO with no SSB and to reference another MO for the SSB that provides timing reference, or SSB configuration is provided in every MO, etc)

R2-1711063 Measurement Configuration in NR with BWP, RRM and beams Rel-15 NR\_newRAT-Core Nokia discussion

=> Offline discussion on introduction of quantity configuration (filters) to be configurable differently for each measurement object (included in scope of offline discussion #30)  
=> We will revisit decision on MO containing a centre frequency plus offset to locate the SSB frequency when RAN4 has concluded discussion of the measurement raster.

R2-1711717 CSI-RS configuration details for NR RRM measurement Samsung Electronics discussion

=> Check within the RRM TP how the UE identifies the CSI-RS resources from those configured in the MO for the serving cell for the purpose of RRM measurement.

R2-1710239 Discussion on NR S-Measure Configuration OPPO discussion

R2-1710431 Discussion on the configuration of the measurement objectZTE Corporation, Sane Chips discussion Rel-15

R2-1711021 S-measure for Connected Mode Measurements Sony discussion Rel-15 NR\_newRAT-Core R2-1709510

R2-1711338 Remaining details for MO Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1711674 Details of SS Block and CSI-RS Measurement Configurations AT&T discussion

R2-1711815 Measurement configuration and procedures for CSI-RS Huawei, HiSilicon discussion Rel-15

*Withdrawn*

R2-1711551 Remaining issues of measurement object configuration for single BWP Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN1 Withdrawn



R2-1710544 Measurement configuration and procedures for CSI-RS Huawei, HiSilicon discussion  
Rel-15 R2-1708214

#### 10.4.1.4.4 Measurement events

*Any additional aspects of measurement events. Potential support for Cx events will be discussed when input has been received from RAN1 on beam management*

*This agenda item is relevant to EN-DC completion*

R2-1711064 Events in NR for any reference symbol Nokia discussion Rel-15 NR\_newRAT-Core  
=> Noted

R2-1711339 Measurement events Cx in NR Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1709293

R2-1711347 Discussion on C1/C2 events Qualcomm Incorporated discussion Rel-15  
NR\_newRAT-Core

R2-1711509 Reconfiguration beam management CSI RS config upon intra-cell mobility Samsung  
Telecommunications discussion Rel-15

R2-1710282 Further considerations on events C1 and C2 CATT, OPPO, vivo, MediaTek discussion  
Rel-15 NR\_newRAT-Core R2-1707900

R2-1710432 Discussion on the introduction of SS-block specific events ZTE Corporation, Sane Chips  
discussion Rel-15

R2-1710672 Measurement Configuration with Ax and Cx Events InterDigital discussion Rel-  
15 NR\_newRAT-Core R2-1708748

R2-1710846 Triggering condition for A1-A6 events in NR Ericsson discussion Rel-15  
NR\_newRAT-Core

R2-1710847 Impact of cell quality scaling in NREricsson discussion Rel-15 NR\_newRAT-Core

R2-1711452 C1/C2 events support in NR Nokia, Nokia Shanghai Bell discussion Rel-15  
NR\_newRAT-Core R2-1708679

#### 10.4.1.4.5 Measurement gaps

*For initial discussion in RAN2 but may be difficult to progress without input from RAN4.*

*This agenda item is relevant to EN-DC completion*

R2-1711564 Measurement capability and measurement gap handling in EN-DC Qualcomm Incorporated  
discussion Rel-15 NR\_newRAT

R2-1711751 Measurement Gap Configuration signalling design for MR-DC NTT DOCOMO INC.  
discussion Rel-15 NR\_newRAT-Core

R2-1710373 Considerations for measurement gap for NR in EN DC Spreadtrum Communications  
discussion Rel-15

R2-1710375 Sliding measurement gap Spreadtrum Communications discussion Rel-15 R2-1707974

R2-1710574 Measurement gap configuration in NR Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core

R2-1710591 Measurement gap in NR Intel Corporation discussion Rel-15 NR\_newRAT-Core  
R2-1708780

R2-1710937 Consideration on measurement gap in NR vivo discussion Rel-15 NR\_newRAT-Core

R2-1711340 Configuration of measurement gap in NR Ericsson discussion Rel-15 NR\_newRAT-  
Core R2-1709294

R2-1711683 Measurement gap considering beam LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1709131

R2-1710575 Definition of GAP assisted measurement in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
*moved from 10.4.1.4.6 to 10.4.1.4.5*

10.4.1.4.6 Other (for EN-DC)

*Other RRM related aspects that are relevant to EN-DC*

*This agenda item is relevant to EN-DC completion*

R2-1710576 Measurement trigger type in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 - Qualcomm wonder whether we need reportCGI to resolve PCI confusion so it is not just for ANR.  
 => Include an extension marker in the measurement trigger type mechanism.

R2-1710801 Measurement Quantities and Cell Quality Derivation in NR MediaTek Inc. discussion

Agreements  
 1: Cell-level RSRQ is derived by averaging beam RSRQ measurements, and the averaging is done on linear domain.  
 2 Introduce RS-SINR based on SS/PBCH block and CSI-RS for L3 mobility. Can be used for triggering Ax events and reporting.  
 3: Cell-level RS-SINR is derived in the same way as other cell quantities. The averaging is performed by averaging beam RS-SINR measurements, and the averaging is done on linear domain.

R2-1710797 Miscellaneous Issues in TP on NR RRM MediaTek Inc. discussion  
 R2-1711508 Measurement configuration and reporting, avoiding LTE deficiencies Samsung  
 Telecommunications discussion Rel-15  
 R2-1710844 Further details related beam level L3 filtering Ericsson discussion Rel-15  
 NR\_newRAT-Core  
 R2-1710378 Measurement requirement issue due to different DRX configurations Spreadtrum  
 Communications discussion Rel-15  
 R2-1710577 S-measure in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1710842 ANR framework in NR Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1710843 TP on inter-RAT ANR to 36.300 for EN-DC Ericsson discussion Rel-15  
 NR\_newRAT-Core  
 R2-1710861 RLC failure in CA duplication MediaTek Inc. discussion NR\_newRAT-Core  
 R2-1710882 RRM Measurement Considering Bandwidth Part Operation MediaTek Inc. discussion  
 R2-1711136 Race conditions in case of SgNB release procedures Ericsson discussion Rel-15  
 NR\_newRAT-Core R2-1708022  
 R2-1711138 Measurement configurations and signaling for fast setup Ericsson discussion Rel-15  
 NR\_newRAT-Core R2-1708026  
 R2-1711202 RRM considerations for adaptive bandwidth in NR Samsung discussion Rel-15  
 R2-1711203 Reference and virtual SS block in NR Samsung discussion Rel-15  
 R2-1711468 L3 filtering configuration Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1711479 Measurement configuration enhancement to enable faster SN addition for EN-DC OPPO  
 discussion R2-1707083

*Withdrawn*

R2-1710580 Speed dependent scaling of measurement parameters in EN-DC Huawei, HiSilicon  
 discussion Rel-15 NR\_newRAT-Core To:RAN1 Withdrawn

- R2-1710883 RRM Measurement Considering Bandwidth Part Operation MediaTek Inc. discussion  
Withdrawn
- R2-1711054 Intra and Inter-frequency definitions and Measurement gaps in NR Nokia discussion Rel-  
15 NR\_newRAT-Core Withdrawn

#### 10.4.1.4.7 Inter-RAT measurements

*Inter-RAT E-UTRA measurements for the purpose of inter-RAT handover from NR to E-UTRA*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

- R2-1710437 Inter-RAT measurements for NR handover to EUTRAN ZTE Corporation, Sane Chips  
discussion Rel-15
- R2-1710572 On the need for Cx events Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1710573 Remaining issue on Events and measurements for handover from NR to E-UTRA Huawei,  
HiSilicon discussion Rel-15 NR\_newRAT-Core  
*moved from 10.4.1.4.5 to 10.4.1.4.7*

#### 10.4.1.4.8 Other (for non EN-DC)

*Other RRM related aspects that are not relevant for EN-DC*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

- R2-1710377 ANR for NR Cell Spreadtrum Communications discussion Rel-15
- R2-1710579 Speed dependent mobility in connected state Huawei, HiSilicon discussion Rel-  
15 NR\_newRAT-Core
- R2-1710841 Mobility states and speed based parameter scaling in NR Ericsson discussion Rel-  
15 NR\_newRAT-Core
- R2-1711204 RRM measurement for multiple numerologies in NR Samsung discussion Rel-  
15
- R2-1711601 Discussion on s-Measure Considering NR-SS and CSI-RS Samsung Electronics discussion  
R2-1709605
- R2-1711603 Discussion on Adaptation of Measurement Related Parameters for Different Mobility Scenarios  
Samsung Electronics discussion R2-1709601
- R2-1711606 The Impact of Beam Sweeping on RRM Measurement Samsung Electronics discussion  
R2-1709606

#### 10.4.1.5 Mobility

*No documents should be submitted to 10.4.1.5. Please submit to 10.4.1.5.x.*

##### 10.4.1.5.1 Beam selection for HO access

*Including output from email discussion [99#28][NR] Beam selection for HO access (Intel)*

*This agenda item is relevant to EN-DC completion.*

*Maximum 1 tdoc per company*

- R2-1710588 Summary of [NR#28][NR] beam selection for HO access Intel Corporation discussion  
Rel-15 NR\_newRAT-Core  
*moved from 10.2.9 to 10.4.1.5.1*

Show of hands on order of access of dedicated RACH  
1 - UE implementation [16]  
2 - Specified order [7]

Agreements

- 1 Dedicated RACH resources (if provided) where the beam quality measured on the associated NR-SS or CSI-RS is above a threshold are prioritized. Common NR-SS threshold and a dedicated NR-SS/CSI-RS threshold, if required, is configured in handover command.
- 2 The order to access the dedicated RACH resources is up to UE implementation

=> RAN2 understanding that Common RACH configuration in the HO command should be the same as in system information (not to be captured in any specification)

Proposal 2: Further discussion of the following options for how long should the dedicated RACH resources be prioritised:

- Option 1: UE attempts up to K suitable dedicated RACH resources that satisfy the condition in Q1 where K is configured by the network, if all RACH attempts on dedicated resources fail then it is up to UE implementation to access common or dedicated RACH (K is small and can be 1)
- Option 2: UE attempts all the suitable dedicated RACH that satisfy the condition in Q1 (at least once for each dedicated RACH or as long as it is satisfied), if all RACH attempts on dedicated resources fail then UE may fall back to common RACH resource
- Option 3: Up to UE implementation
- Option 4: UE attempts suitable dedicated RACH as long as one dedicated RACH satisfies condition in Q1. Only if not dedicated RACH meet the criteria then UE may fall back to common RACH resource.

the definition of "suitable" aligns with RAN1 agreements in RAN1#90

R2-1711461	Beam selection during NR HO NR_newRAT-Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15
R2-1710082	Beam Selection for HO Access NR_newRAT-Core	Samsung R&D Institute India	discussion	Rel-15
R2-1711365	Remaining issues of beam selection for handover access Rel-15 NR_newRAT-Core	Qualcomm Incorporated	discussion	
R2-1710852	On beam selection during hand-over, SCG addition and SCG change discussion Rel-15 NR_newRAT-Core	Ericsson		
	- Above 4 papers discussed together			

Option 1: UE initiates the random access procedure using a dedicated RACH configuration if at least one of the dedicated beams is suitable. Further details of the prioritization (such as which dedicated beam should be selected, and how long the UE should prioritize the dedicated RACH configuration etc) are left up to the UE implementation.

Option 2:.

Show of handles

Option 1 [8]

Option 2 [12]

Agreements for handover and PSCell change involving RACH:

- 1 UE shall not switch to contention-based RACH resources if there are dedicated RACH resources fulfilling the quality threshold specified above
- 2 Same behaviour as for LTE for T304 and T307

=> MAC and RRC TP relating to these agreements in R2-1711994 (Offline discussion #41, Ericsson)

R2-1711994	Offline discussion #41: Text proposal for MAC and RRC relating to beam selection during handover	Ericsson	pCR	Rel-15 NR_newRAT-Core
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☒ **[99bis#23][NR] TP on beam selection (Ericsson)**

Rapporteur can set an earlier deadline to make the MAC TP available earlier for inclusion in MAC TS. (Parameters will be covered by the RRC emails discussions)

Intended outcome: Agreed TP for inclusion in MAC TS

Deadline: Thursday 2017-11-09

R2-1710263	Beam selection during handover	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1710442	RACH beam selection for handover access	ZTE Corporation, Sane Chips	discussion	Rel-15	
R2-1710675	Beam Selection for Handover in NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1710938	Clarification on the PRACH resource selection of multiple beams	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1711371	Beam selection in NR handover	Lenovo, Motorola Mobility	discussion	Rel-15	NR_newRAT-Core
R2-1711766	Discussion on how the dedicated RACH resources should be prioritized	ITRI	discussion		NR_newRAT-Core
R2-1710589	Remaining issue in RACH procedure during handover	Intel Corporation	discussion		Rel-15 NR_newRAT-Core
	<i>moved from 10.2.9 to 10.4.1.5.1</i>				
R2-1711482	Beam selection for RACH procedure during HO	OPPO	discussion		NR_newRAT-Core
	<i>moved from 10.4.1.3.5 to 10.4.1.5.1</i>				

#### 10.4.1.5.2 SCG change for EN-DC

*Stage 3 details of SCG change for EN-DC.*

*This agenda item is relevant to EN-DC completion.*

R2-1710848	Further details of handover execution/SCG change in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
	=> Noted				

#### 10.4.1.5.3 SCG failure for EN-DC

*Stage 3 details for SCF failure for EN-DC, including both the NR and LTE aspects of the procedure.*

*This agenda item is relevant to EN-DC completion.*

R2-1710283	open issues for SCG failure	CATT	discussion	Rel-15	NR_newRAT-Core
	P1				
	<ul style="list-style-type: none"> <li>- Samsung is not sure that beam measurement results are useful in this case. Can they be reliable and the measurements not changed between when they are performed and when the SCG is selected.</li> <li>- Nokia think there is value in reporting beam level measurements if available. ZTE also support and the measurements are still fresh as the measurements continue at RLF. Ericsson also support the proposal and think the situation is the same as SeNB addition.</li> <li>- Samsung wonders what happens with this beam information. What actions can be taken on it or is it used for SON/ANR type purposes. Nokia think it was agreed last time that the measurements are forwarded to the SN. Ericsson also think that we have a decision that the MN can keep change or release the SN and if needed they can be forward.</li> <li>- Nokia clarify this discussion relates to the SN part.</li> <li>- CATT explain that the measurements are not intended on one particular purpose. The network may use for different reasons. Ericsson think that the beam measurements are not just relevant for RACH configuration, but also for handover decision</li> </ul>				
	P5				

- Huawei prefer a different structure from measurement report so the SN does not need to know the configuration. CATT think they are encoded in NR format from UE to MN. Ericsson think we already agreed that they should be encoded with ARFCN so SN doesn't need to know the configuration.

Agreements

- 1 Available beam level measurements for serving cell and neighbour cells are included as SN part measurement results in SCGFailureInformation, and can be beam identifier and beam measurement results. What information is reported is determined from the SN measurement configuration.
- 2 Available beam level measurements for NR neighbour cells are included as MN part measurement results in SCGFailureInformation, and can be beam identifier and beam measurement results. What information is reported is determined from the MN inter-RAT NR measurement configuration.

R2-1711301 Remaining Issues for UE Procedures on SCG Failure discussion Samsung R&D Institute India

Agreements

- 1: Define scg-ConfigurationFailure failure type in TS 36.331 for SgNB configuration failure

R2-1710859 Considerations for the format of NR cell measurements for SCGFailureIndication discussion Rel-15 NR\_newRAT Nokia, Nokia Shanghai Bell

- Ericsson think we already agreed that SCG failure would have 2 parts. Ericsson agree with Ericsson as the MN measurements are not needed in the SN.
  - MediaTek also think this is not very necessary.
  - CATT think the MN would be able to read some results for frequencies that are not configured by the MN.
- => Can be discuss as part of the discussion of the running CR and RRM TP.

R2-1711758 Remaining issues on SCG failure handling NTT DOCOMO INC., Nokia, Nokia Shanghai Bell, NEC, Fujitsu discussion Rel-15 NR\_newRAT-Core

*moved from 10.2.7 to 10.4.1.5.3*

- Ericsson think we already agreed the MN will keep change or release. These proposals seems to go against this decision. Also this is a failure case.
  - Nokia think proposal 1 and 2 describe the expected behaviour. Think the MN does have the final decision what to do but before this is should wait for the SN to process the measurement results that were forwarded
  - Samsung think it is good in most cases that the MN takes the decision and SN should not have to be involved in every case. Can be considered as an optimisation in future. Huawei have a similar view. MN does not need to wait for the SN.
  - IDC support the view of Nokia and think the MN takes the final decision but based on some feedback from the SN.
  - CATT think there is nothing that prevents this in the network.
  - Intel think that now we have agreed that the configuration is kept in the UE then this optimisation may not be so critical.
- => Noted

R2-1710331 Handling on SN measurement results upon SCG failure Rel-15 NR\_newRAT-Core ZTE Corporation discussion

R2-1711099 NR failure handling for both SA and NSA NR\_newRAT-Core Huawei, HiSilicon discussion Rel-15

R2-1711131 Remaining issues regarding SCG Failure Core Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1711134 Further consideration on SCell RLF for CA Core Ericsson discussion Rel-15 NR\_newRAT-Core

- R2-1711256 On measurement results in SCGFailureInformation NR\_newRAT-Core CMCC discussion Rel-15
- R2-1711139 SCG reconfiguration failure handling in EN-DC NR\_newRAT-Core To:SA2 Cc:CT1, RAN3 Ericsson discussion Rel-15  
*moved from 10.4.1.3.4 to 10.4.1.5.3*
- R2-1710931 Behavior on SCG failure and TP for 37340vivo discussion Rel-15 NR\_newRAT-Core  
*moved from 10.2.7 to 10.4.1.5.3*

TPs

- R2-1710885 TP on Radio Link Monitor related actions in 38.331 MediaTek Inc. discussion NR\_newRAT-Core  
 => Comments are invited to be provided offline, including agreements that may not have been taken into account.  
 => To be updated with any agreements from this meeting  
 => Revised in R2-1712009 (Offline discussion #44)
- R2-1712009 TP on Radio Link Monitor related actions in 38.331 MediaTek Inc. discussion NR\_newRAT-Core  
 => Remove " for an SCG SRB, SCG or split DRB ". Similar change needed for other references to bearer types.  
 => Endorsed to be merged into the draft TS.
- R2-1710886 TP to support SCG Failure in EN-DC MediaTek Inc. discussion NR\_newRAT-Core  
 - Intel point out that this uses a new version of FailureReportSCG  
 - Ericsson think there is a need to differentiate in the procedure description where the configuration was received for SCG reconfig failure.  
 - Nokia ask how to progress the measurement results format.  
 => Comments are invited to be provided offline, including agreements that may not have been taken into account.  
 => To be updated with any agreements from this meeting  
 => Final ASN.1 structure for the measurements in SCG failure will be decided when NR measurement report format is stable.  
 => Revised in R2-172010 (Offline discussion #45)
- R2-1712010 TP to support SCG Failure in EN-DC MediaTek Inc. discussion NR\_newRAT-Core  
 => Revised in R2-1712062
- R2-1712062 TP to support SCG Failure in EN-DC MediaTek Inc. discussion NR\_newRAT-Core  
 => Endorsed to be merged into draft TS, and running LTE RRC CR.
- R2-1711132 TP for TS 36.331 - SCG Failure Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1711133 TP for TS 38.331 - SCG Failure Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1710624 TPs for 38.331 and 36.331 for SCG failure in EN-DC Intel Corporation discussion Rel-15 NR\_newRAT-Core  
*moved from 10.4.1.3.4 to 10.4.1.5.3*

10.4.1.6 System information

*No documents should be submitted to 10.4.1.6. Please submit to 10.4.1.6.x.*

10.4.1.6.1 MIB content

*Including confirmation (or otherwise) of working assumption from last meeting, and any further details of the MIB content required for EN-DC operation.*

*This agenda item is relevant to EN-DC completion*

- R2-1711518 Open issues on PBCH contents for NR Qualcomm Incorporated, NTT DoCoMo, Samsung, KT, vivo, Panasonic, LG Electronics Inc., KDDI discussion Rel-15 NR\_newRAT-Core
- Huawei prefer to confirm the WA. Also think the behaviour should be a bit different for the 2 bits. And the bit in MIB is specifically for a future SA UE to know that this frequency is NAS. And the bit in SIB is the same as the LTE barring bit.
  - Qualcomm think SA cells could be on the same carrier as NSA cells. But the new bit forces UE to move to another carrier. Vodafone think this deployment where both NSA and SA are in the same area will not happen.
  - Vivo understand the new bit is for the NSA case only. It limits the UE as the UE cannot make intra-freq reselection.
  - Lenovo support the Qualcomm paper.
  - ZTE share Huawei's view.

Show of hands

- 1 - Confirm working assumption [13]
- 2 - Revisit working assumption [15]

- 1 - WA is not acceptable [11]
- 2 - Approach in 1518 not acceptable [3]

Agreements (replace the WA from previous meeting that is not confirmed)

1: "cellBarred" IE (corresponding to "Information for quick identification that UE can't camp on the cell" in RAN1 LS) is present in the MIB and it has the same effect as the LTE "cellBarred" IE. FFS Duration of the barring timer.

2: "intraFreqReselection" IE is present in the MIB and it has the same effect as the LTE "intraFreqReselection" IE

FFS Whether additional "cellBarred" and "intraFreqReselection" IEs are signalled in NR SIB1

=> Draft LS to RAN1 to inform them of our decision that RAN2 needs 2 bits plus one spare bit.  
Draft LS in R2-1712011 (Offline discussion #46, Qualcomm)

- R2-1712011 [DRAFT] LS on PBCH content Qualcomm LS out Rel-15 NR\_newRAT-Core  
To:RAN1  
=> Approved in R2-1712056

- R2-1710382 Open issues on MIB contents Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Offline checking of the status in RAN1 regarding the size of the MIB. (Aim to comeback Thursday)
- AT+T explain that the current number of spare bits is 14(9) and 17(12) for the two cases that RAN1 is working on (sub six and above six) but some may also be needed for RMSI config. Number in brackets relates to 24bit CRS. This assumes the 2 bits from RAN2.

Agreements

- At least one spare bit is needed for RAN2 purposes in future

=> Include in email regarding offline discussion #46

- R2-1710416 Multi-PLMN aspects of NSA bit in MIB ZTE Corporation, Sane Chips discussion Rel-15

- R2-1710392 Transmission time interval for NR-MIB and NR-SIB1 Ericsson discussion Rel-15 NR\_newRAT-Core
- Qualcomm think this is not aligned to RAN1 agreement. The TTI could be 160 but RAN1 have defined a TTI of 80ms.
  - Ericsson think it would be strange for a TTI of 80ms with a period of 160ms.
  - Samsung understand that 80ms is the maximum in RAN1.
- => Offline checking of the status in RAN1 regarding the MIB TTI and the SSB periodicity.



- Update from offline: RAN1 have agreed that the SSB can be sent 80ms or 160ms but is modeling the TTI at 80ms. Question is what RAN2 would like the TTI of SIB1 to be (current option 80 or 160).
- => We wait for expected RAN1 input.

R2-1710454	Discussion on barring indication in NR-MIB Rel-15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1710455	Discussion on maximum idle mode DRX value in NR Rel-15 NR_newRAT-Core R2-1708066	Huawei, HiSilicon	discussion	
R2-1710456	[DRAFT] Reply LS on maximum idle mode DRX value Rel-15 NR_newRAT-Core R2-1708067	Huawei, HiSilicon	LS out	Rel-
R2-1711022	Cell Barring timer	Sony	discussion	Rel-15 NR_newRAT-Core
R2-1711616	Cell barred indication in NR MIB	NEC	discussion	Rel-15 NR_newRAT-Core
R2-1711743	Remaining aspects of PBCH and Some SIB1 contents discussion	Samsung R&D Institute India		

*Late*

R2-1710284	MIB contents for EN-DC	CATT	discussion	Rel-15 NR_newRAT-Core
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#### 10.4.1.6.2 System information content/structure

*Progress details of the content and structure of system information (excluding MIB content covered in AI 10.4.1.5.2)*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows .*

R2-1710180	Initial considerations on Content of Other SI for NR	OPPO	discussion	
R2-1710383	System Information Structure and Content	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710389	SIBs needed for stand-alone NR deployments NR_newRAT-Core R2-1708163	Ericsson	discussion	Rel-15
R2-1710391	System information content at network sharing NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1710417	Consideration on the Content of NR-RMSI(Revision) discussion	Rel-15		ZTE Corporation, Sane Chips
R2-1710458	Detailed design on of the contents of System Information Rel-15 NR_newRAT-Core	Huawei, HiSilicon	discussion	
R2-1710459	SIBs needed for NSA R2-1709620	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711372	Quasi-co-location information in SIB1 and RRC Reconfiguration Rel-15 NR_newRAT-Core	Ericsson LM	discussion	
R2-1711514	Organization of NR System Information NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-15
R2-1711587	Structure and Content of Remaining Minimum SI Rel-15 NR_newRAT-Core R2-1709561	Nokia, Nokia Shanghai Bell	discussion	
R2-1711740	Endorsed TP to 38.331 on System Information	Samsung R&D Institute India	other	

#### 10.4.1.6.3 Stored system information

*Further details of stored SI including index/identifier format*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

*Maximum 1 tdoc per company*

R2-1710139	Area ID and details on value tag message structure for NR	Gemalto N.V.	discussion	
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R2-1710285	Indexed SI in NR	CATT	discussion	Rel-15	NR_newRAT-Core	R2-1707906
R2-1710361	The index of stored system information	Fujitsu	discussion	Rel-15	NR_newRAT-Core	
R2-1710384	SS Block index dependent system information	Ericsson	discussion	Rel-15	NR_newRAT-Core	
R2-1710385	Stored System Information	Ericsson	discussion	Rel-15	NR_newRAT-Core	
R2-1710418	Consideration on the Stored other SI(Resubmit)	ZTE Corporation, Sane Chips	discussion	Rel-15	NR_newRAT-Core	
R2-1710460	Area ID and value tag for SIBs	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core	R2-1708069
R2-1710673	Details of Stored System Information for NR	InterDigital	discussion	Rel-15	NR_newRAT-Core	
R2-1710814	SI valid area configuration	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core	R2-1708908
R2-1710939	Stored SI for NR	vivo	discussion	Rel-15	NR_newRAT-Core	R2-1708423
R2-1711308	On structure of SI index	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core	R2-1708042
R2-1711589	Signalling of System Information Area	Nokia, Nokia Shanghai Bell	discussion	Rel-15	NR_newRAT-Core	R2-1709562
R2-1711670	Necessity of Area ID for on-demand SI	NTT DOCOMO, INC., Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core	R2-1707776
R2-1711752	Index based approach and Stored SI	SAMSUNG Electronics Co., Ltd.	discussion	Rel-15	NR_newRAT-Core	R2-1709497

#### 10.4.1.6.4 System information modification

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

*Maximum 1 tdoc per company*

R2-1710094	System Information Update in NR	Samsung R&D Institute India	discussion	Rel-15	NR_newRAT-Core	R2-1707676
R2-1710181	Discussion on NR SI Modification	OPPO	discussion	Rel-15	NR_newRAT-Core	R2-1707766
R2-1710286	SI Modification	CATT	discussion	Rel-15	NR_newRAT-Core	
R2-1710386	Change of System information in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core	
R2-1710461	SI Update procedure	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core	R2-1708070
R2-1710674	SI Modification Procedure in NR	InterDigital	discussion	Rel-15	NR_newRAT-Core	
R2-1710940	SI Change Notification	vivo	discussion	Rel-15	NR_newRAT-Core	R2-1708424
R2-1711307	NR SI Update	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core	R2-1708051
R2-1711390	System information modification	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core	R2-1708465
R2-1711566	SI modification for Stored SI	ITL	discussion	Rel-15	NR_newRAT-Core	
R2-1711592	System Information Modification in NR	Nokia, Nokia Shanghai Bell	discussion	Rel-15	NR_newRAT-Core	R2-1709564
R2-1711767	Discussion on the granularity of SI change notification	ITRI	discussion	Rel-15	NR_newRAT-Core	R2-1709080

#### 10.4.1.6.5 System information scheduling

*This agenda item is not relevant to EN-DC completion and but will be treated if time allows*

*Maximum 1 tdoc per company*

R2-1710095	SI Message TX/RX in NR Core	Samsung R&D Institute India	discussion	Rel-15 NR_newRAT-Core	R2-1707677
R2-1710179	Consideration on NR SI Scheduling	OPPO	discussion		R2-1707767
R2-1710387	System Information Scheduling	Ericsson	discussion	Rel-15 NR_newRAT-Core	R2-1708167
R2-1710462	Considerations on System Information scheduling	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	R2-1708071 Withdrawn
R2-1710488	Considerations on System Information scheduling	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	
R2-1710941	Scheduling of Other SI	vivo	discussion	Rel-15 NR_newRAT-Core	R2-1708425
R2-1711089	Details of Other SI scheduling information	ETRI	discussion	Rel-15 NR_newRAT-Core	R2-1707943
R2-1711391	System information scheduling	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core	R2-1708466

#### 10.4.1.6.6 On demand system information

*Including need for additional bit to indicate if SI message is actually being broadcast*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710096	On Demand SI: Remaining Issues	Samsung R&D Institute India	discussion	Rel-15 NR_newRAT-Core	R2-1707678
R2-1710161	Resolving remaining FFSS	Lenovo, Motorola Mobility	discussion	Rel-15 NR_newRAT-Core	R2-1708063
R2-1710178	Discussion on Remaining Issues of On-Demand SI	OPPO	discussion	R2-1707765	
R2-1710250	Discussion on Multiple On-demand System Information Acquisition	SHARP Corporation	discussion		
R2-1710388	Remaining issues on On-demand SI	Ericsson	discussion	Rel-15 NR_newRAT-Core	R2-1708168
R2-1710419	On-demand SI- further consideration on the Msg3 Content	ZTE Corporation, Sane Chips	discussion	Rel-15	
R2-1710463	On demand SI acquisition and failure handling	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	
R2-1710676	On Demand SI Request Procedure	InterDigital	discussion	Rel-15 NR_newRAT-Core	
R2-1710812	Other-SI request and acquisition in CONNECTED	LG Electronics Inc.	discussion	Rel-15 LTE_euCA-Core	R2-1708901
R2-1710942	Remaining issues of on demand SI	vivo	discussion	Rel-15 NR_newRAT-Core	
R2-1711030	Remain issues of on-demand SI	Beijing Xiaomi Mobile Software	discussion	Rel-15 R2-1709164	
R2-1711309	Indicator for Other SI Transmission	MediaTek Inc.	discussion	R2-1708041	
R2-1711389	Remaining issues on on-demand SI request procedure	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core	R2-1708461
R2-1711516	Open issues on NR on-demand SI	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core	
R2-1711768	Discussion on the additional indication for on-demand SI	ITRI	discussion	NR_newRAT-Core	R2-1709079
R2-1711827	UE Requirements for SI on demand	Vodafone Group Plc	discussion		

#### 10.4.1.6.7 System information -other

*Other system information related aspects*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting*

R2-1710390	Dedicated System Information R2-1708170	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1710464	Assisted Delivery of "Minimum SI" Core R2-1708073	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-
R2-1710465	Public Warning system for NR Core R2-1708074	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-
R2-1710943	Discussion on other SI request 1708428	vivo	discussion	Rel-15	NR_newRAT-Core R2-
R2-1711392	UE dedicated on-demand SI delivery in NR 15 NR_newRAT-Core R2-1708467	LG Electronics Inc.	discussion	Rel-	
R2-1711510	Dedicated signalling of SI upon UE mobility Rel-15	Samsung Telecommunications	discussion		
R2-1711630	On supporting multiple modification periods in NR Core	Samsung	discussion		NR_newRAT-
R2-1711757	List of FFS for SI handling	Samsung R&D Institute India	other		
R2-1711807	Initial access for supplementary uplink frequency 15 NR_newRAT-Core	Samsung Electronics	discussion	Rel-	

#### 10.4.1.7 Inactive state

*No documents should be submitted to 10.4.1.6. Please submit to 10.4.1.6.x.*

##### 10.4.1.7.1 RAN area configuration

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Maximum 1 tdoc per company*

R2-1711984	[DRAFT] LS reply to LS on definition of RAN Notification Area in inactive state out Rel-15 NR_newRAT-Core To:RAN3	Nokia	LS		
	<ul style="list-style-type: none"> <li>- Summary of offline #08 from Nokia: All agreed it was feasible to support all options but results in more UE and network testing and it would be preferable to limit options. But also understanding that it is difficult to support all deployment options. So most people were ok to support all options.</li> <li>- Intel think that UE support should be a separate discussion after the work is complete.</li> <li>- Vodafone doesn't see a use case why all need to be supported, but if supported the UE should support them all from the beginning. If that can't be agreed then we should select one option. Intel is concerned that not all option will be testable if networks don't support all options.</li> <li>- Samsung also has concern on testability but also think it will not be practical to have IOT bits for all these options. Also consider that the options 2 and 3 are marginal from signalling point of view.</li> <li>- LG think capability should be discussed later and prefer to focus on spec.</li> </ul>				
	<p>=&gt; Discussion on availability of networks for testing to be had in future as per normal process. =&gt; Change to " RAN2 understanding of the package would be that:</p> <ol style="list-style-type: none"> <li>1. The specification supports all the options.</li> <li>2. For a UE, only one option is configured at a time (no mixing of options).</li> <li>3. NW may provide different options for different UEs.</li> <li>4. A UE that supports inactive will support all these options. "</li> </ol> <p>=&gt; Approved in R2-1712006</p>				
R2-1710829	RAN Notification Area configuration Core	Ericsson	discussion	Rel-15	NR_newRAT-
R2-1710581	RAN notification area configuration NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15	

- R2-1710120 RAN paging area for NR Samsung discussion Rel-15 NR\_newRAT-Core
- R2-1710233 Discussion on Assistance Information for RAN-Based Notification Area Decision OPPO discussion
- R2-1710287 RAN-based notification area configuration (related to RAN3 LS R3-173427)CATT discussion Rel-15 NR\_newRAT-Core
- R2-1710428 Consideration on RAN area configuration ZTE Corporation, Sane Chips discussion Rel-15
- R2-1710595 RAN notification area configuration Intel Corporation discussion Rel-15 NR\_newRAT-Core R2-1708805
- R2-1710830 Draft LS response to RAN3 LS on RAN Notification Areas Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1711144 Definition of RAN Notification AreaLG Electronics France discussion NR\_newRAT-Core
- R2-1711465 Discussion on RAN Notification Area ConfigurationSHARP Corporation discussion R2-1708178
- R2-1711780 RNA configuration China Telecom Corporation Ltd. discussion
- R2-1711061 Draft LS resposne on RAN paging are to RAN3 LS R3-173427 Nokia discussion Rel-15 NR\_newRAT-Core  
*moved from 10.1 to 10.4.1.7.1*  
*=> Revised in R2-1711984*
- R2-1711057 RAN based notification area Nokia discussion Rel-15 NR\_newRAT-Core R2-1708474  
*moved from 10.4.1.6.1 to 10.4.1.7.1*

#### 10.4.1.7.2 RAN area update procedure

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Maximum 1 tdoc per company*

- R2-1710121 RRC procedures for the RAN paging area Samsung discussion Rel-15 NR\_newRAT-Core
- R2-1710429 Consideration on periodic RAN area update procedure ZTE Corporation, Sane Chips discussion Rel-15
- R2-1710582 Discussion on CN location Update and RNA Update for inactive state Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1710596 RNAU failure handling Intel Corporation discussion Rel-15 NR\_newRAT-Core
- R2-1710677 RAN Location Area Update Procedure for NR InterDigital discussion Rel-15 NR\_newRAT-Core
- R2-1710825 Retrieve UE Context via CN for RLAU Potevio discussion
- R2-1710827 RAN area update in RRC\_INACTIVE Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1710982 Discussion on RAN-based location area update procedure in NR ASTRI, TCL Communication Ltd. discussion
- R2-1711149 Timer handling of RAN-based location area update LG Electronics France discussion Rel-15 NR\_newRAT-Core
- R2-1711373 Discussion on RAN notification area update Lenovo, Motorola Mobility discussion Rel-15 NR\_newRAT-Core
- R2-1711760 Periodic RNA update CATT discussion Rel-5 NR\_newRAT-Core R2-1707908

#### 10.4.1.7.3 Paging in inactive

*RRC procedure to respond to paging, including any differences between RAN and CN paging*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

R2-1710122	Further considerations on the CN and RAN paging	Samsung	discussion	Rel-15
	NR_newRAT-Core			
R2-1710231	Introduction of the Non-Contention based RACH for INACTIVE UE	OPPO	discussion	
R2-1710288	Procedure of paging in inactive	CATT	discussion	Rel-15 NR_newRAT-Core R2-1707909
R2-1710597	RAN-initiated paging details	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1711126	CN-initiated paging for a UE in RRC_INACTIVE	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1709107
R2-1711153	Paging Failure Handling in RRC_INACTIVE	CMCC	discussion	Rel-15 NR_newRAT-Core
R2-1711366	Paging in RRC_INACTIVE	Ericsson	discussion	Rel-15 NR_newRAT-Core R2-1708171
R2-1711393	RAN paging DRX in RRC_INACTIVE	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1708464
R2-1711502	RAN initiated paging	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1709529

#### 10.4.1.7.4 Inter-RAT mobility between NR Inactive and E-UTRA/5GC Inactive

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710123	Inter-RAT mobility in the RRC INACTIVE state	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1710124	Text proposal UE inter-RAT re-selection in INACTIVE	Samsung, Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core
R2-1710583	Inter-RAT mobility for inactive UE	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710598	Mobility of UE in INACTIVE between NR and E-UTRA connected to 5GC	Intel Corporation	discussion	Rel-15 NR_newRAT-Core R2-1708807
R2-1710836	Mobility between LTE and NR for inactive Ues	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711353	Additional SIB in EUTRAN for supporting NR SA deployments	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1711690	Inter-RAT mobility between NR and eLTE for Inactive state	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1709284 To:SA1

#### 10.4.1.7.5 Security framework for inactive

*Security framework for inactive UEs to address FFS arising from email discussion 98#30.*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

R2-1710568	Security of INACTIVE to CONNECTED state transition	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711771	Security procedure from RRC_INACTIVE state in NR	SAMSUNG Electronics Co., Ltd.	discussion	R2-1709501
R2-1711056	Security in inactive state	Nokia	discussion	Rel-15 NR_newRAT-Core R2-1708473 <i>moved from 10.4.1.6.5 to 10.4.1.7.5</i>
R2-1710835	Security for RRCConnectionResumeRequest message	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710599	NR security framework	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1710600	[DRAFT] LS on security handling for resumption, re-establishment and handover	Intel Corporation	discussion	Rel-15 NR_newRAT-Core LSout

- R2-1710944 Security aspects in RRC INACTIVE vivo discussion Rel-15 NR\_newRAT-Core  
 R2-1711147 Consideration on security aspect for inactive UEs LG Electronics France discussion Rel-15 NR\_newRAT-Core  
 R2-1711796 [DRAFT] LS on security framework for INACTIVE in NR Samsung R&D Institute India LSout  
 R2-1710667 Security Aspects of Connection Control InterDigital discussion Rel-15 NR\_newRAT-Core  
*moved from 10.4.1.3.7 to 10.4.1.7.5*

10.4.1.7.6 Inactive - other

*Other inactive state related aspects*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

- R2-1710232 Discussion on Cell Reselection Priority for INACTIVE UE OPPO discussion  
 R2-1710234 Discussion on Cached Data Handling for INACTIVE UE OPPO discussion  
 R2-1710381 Consideration on UE Identity in RNA Spreadtrum Communications discussion Rel-15 Withdrawn  
 R2-1710473 RAN Sharing and identifier aspects in NR Ericsson discussion Rel-15 NR\_newRAT-Core R2-1708172  
 R2-1710545 RLAU procedure and interaction with TAU Huawei, HiSilicon discussion Rel-15 R2-1708215  
 R2-1710584 RRC state transition from INACTIVE to IDLE Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1710585 Cell reselection for inactive UEs Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1710586 Support of redistribution priority in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1710601 NAS/AS interaction when resuming Intel Corporation discussion Rel-15 NR\_newRAT-Core R2-1708809  
 R2-1710627 Cell reselection for inactive UEs Intel Corporation discussion Rel-15 NR\_newRAT-Core R2-1708815  
 R2-1710786 RRC\_INACTIVE Principles Qualcomm Incorporated discussion R2-1709635  
 R2-1710828 CN area updating in RRC\_INACTIVE Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1710831 UE context ID discussion Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1711079 UE actions upon cell reselection in RRC\_INACTIVE ASUSTEK COMPUTER (SHANGHAI) discussion Rel-15 NR\_newRAT-Core R2-1709332  
 R2-1711124 Consideration on MICO mode for RRC\_INACTIVE LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1709104  
 R2-1711125 Support for PLMN selection in RRC\_INACTIVE LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1709108  
 R2-1711143 Offloading UEs in RRC\_INACTIVE LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1709110  
 R2-1711395 Handling of radio bearers and security for data transmission in RRC\_INACTIVE LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1708459  
 R2-1711818 PLMN Selection in RRC INACTIVE state SAMSUNG Electronics Co., Ltd. discussion R2-1709500  
 R2-1711055 Consistent support of RRC\_INACTIVE Nokia discussion Rel-15 NR\_newRAT-Core R2-1708472  
*moved from 10.4.1.6.5 to 10.4.1.7.6*

## 10.4.1.8 Access control

*Continue to progress unified access control*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

✉ **[99bis#24][NR] AC (Intel)**

Gather questions on the SA1 requirements and clarifications that may be needed.

Intended outcome: LS to SA1 for approval at beginning of next RAN2 meeting.

Deadline: Thursday 2017-11-09

R2-1710602	RAN implications of 5G Access Control requirements Rel-15 NR_newRAT-Core	Intel Corporation	discussion	
R2-1710170	QoS Flow based Access Control for CONNECTED Mode in NR NR_newRAT-Core	TCL	discussion	
R2-1710261	Discussion on access control in NR R2-1706340	OPPO	discussion	Rel-15 NR_newRAT-Core
R2-1710289	Consideration on access control	CATT	discussion	Rel-15 NR_newRAT-Core
R2-1710423	Establishment cause and call type for NR access control discussion	Rel-15	ZTE Corporation, Sane Chips	
R2-1710424	Consideration on the access control in NR	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1710477	Signaling of access control parameters Core	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710478	Access control for NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710479	Access Control for RRC-initiated Access Attempts NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1710480	Establishment causes for NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710481	Draft LS to CT1 on establishment causes	Ericsson	LS out	Rel-15 NR_newRAT-Core
R2-1710482	Draft Reply LS to SA1 on Unified Access Control for 5G NR 15 NR_newRAT-Core	Ericsson	LS out	Rel-15
R2-1710603	5G access control mechanism in IDLE and INACTIVE Rel-15 NR_newRAT-Core	Intel Corporation	discussion	
R2-1710604	5G access control mechanism in CONNECTED 15 NR_newRAT-Core R2-1708812	Intel Corporation	discussion	Rel-15
R2-1710800	Unified Access Control in different RRC Modes 1709648	Qualcomm Incorporated	discussion	R2-15
R2-1710897	Considerations on Access Control in NR	KT Corp.	discussion	
R2-1711273	Access Barring in NG-RAN NR_newRAT-Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15
R2-1711274	Access Control applicability to different RRC states discussion	Rel-15 NR_newRAT-Core	Nokia, Nokia Shanghai Bell	
R2-1711275	Congestion Control for RRC_CONNECTED Rel-15 NR_newRAT-Core R2-1709208	Nokia, Nokia Shanghai Bell	discussion	
R2-1711385	Access category based access barring for RRC_IDLE and RRC_INACTIVE Electronics Inc. discussion	Rel-15 NR_newRAT-Core R2-1708455	LG	
R2-1711394	Random Access Backoff and Access Barring 15 NR_newRAT-Core R2-1708463	LG Electronics Inc.	discussion	Rel-15
R2-1711398	Access category based access barring mechanism for RRC_CONNECTED discussion	Rel-15 NR_newRAT-Core R2-1708458	LG Electronics Inc.	
R2-1711487	Basic Access Control in NR Core R2-1709545	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core



R2-1711498	Access Control in NR for RRC_CONNECTED Rel-15 NR_newRAT-Core R2-1709551	Huawei Technologies France	discussion	
R2-1711499	Access Control in RRC_INACTIVE NR_newRAT-Core R2-1709542	Huawei, HiSilicon	discussion	Rel-15
R2-1711500	Access Control for MT R2-1709552	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711624	Way-forward for NR access control	Samsung	discussion	NR_newRAT-Core
R2-1711625	NR access control procedure	Samsung	discussion	NR_newRAT-Core
R2-1711626	On linking Establishment Cause and standardized access category	Samsung	discussion	
R2-1711627	Barring configuration in NR access control	Samsung	discussion	NR_newRAT-Core
R2-1711628	Barring skip indicator in NR	Samsung	discussion	NR_newRAT-Core
R2-1711635	Unified Access Control	MediaTek Beijing Inc.	discussion	

#### 10.4.1.9 Inter-Node RRC messages

*Structure and content of the Inter-Node RRC messages used for EN-DC procedures.*

*This agenda item is relevant to EN-DC completion.*

- R2-1711503 Defining initial baseline inter-node signalling for 38.331 Samsung Telecommunications  
discussion Rel-15
- Ericsson would prefer to add these in the LTE RRC spec. in order to reuse IEs defined in that spec.

##### Agreements

- 1 Introduce in the NR RRC specification inter-node messages (INM) for:
  - a) SCG (re-)configuration, to be used for SCG establishment/ reconfiguration/ change involving an NR SN (used regardless of the RAT used by MN)
  - b) Handover: to be used upon change to an NR target MN (used regardless of the RAT used by source MN)
- 2 Introduce inter node messages in NR RRC as follows (LTE names merely used by example), and with contents according to Tab. 1. These messages are used regardless of the RAT used by source RAN:
  - o HandoverPreparationInformation
  - o HandoverCommand
  - o SCG-ConfigInfo
  - o SCG-Config
- 3 No additional RRC inter node messages are introduced specifically for SN initiated change of SN, i.e:
  - a) There is a single RRC inter-node message to cover SgNB Change Required, SgNB Addition Request and SgNB Modification Request
  - b) There is a single RRC inter-node message to cover SgNB Change Required Ack, SgNB Addition Request Ack and SgNB Modification Request Ack

##### ☒ [99bis#25][NR] Inter-node RRC messages (Samsung)

Progress details of internode RRC messages based on agreements from this meeting. First version can already take into account contributions submitted to this meeting.

Intended outcome: TP for the RRC inter node messages

Deadline: Thursday 2017-11-09

R2-1710513	Internode RRC messages for EN-DC Core	Ericsson	discussion	Rel-15 NR_newRAT-
R2-1710853	Text proposal for mobility related inter-node messages 15 NR_newRAT-Core	Ericsson	discussion	Rel-

- |            |   |                          |            |        |
|------------|---|--------------------------|------------|--------|
| R2-1711100 | Inter-node message design for EN-DC<br>NR_newRAT-Core                 | Huawei, HiSilicon        | discussion | Rel-15 |
| R2-1711400 | Measurement result contents for SN addition in MRDC<br>discussion     | Samsung R&D Institute UK |            |        |
| R2-1711823 | Inconsistencies of inter-node messages in RAN2 and RAN3<br>discussion | HTC Corporation          |            |        |

#### 10.4.1.10 Other (non EN-DC)

*Other RRC related aspects*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

- |            |   |                               |            |        |                           |
|------------|---|-------------------------------|------------|--------|---------------------------|
| R2-1710483 | Wait Timer in NR  | Ericsson                      | discussion | Rel-15 | NR_newRAT-Core            |
| R2-1711806 | UE Assistance Information for energy efficiency enhancement<br>discussion | Samsung Electronics           |            | Rel-15 | NR_newRAT-Core R2-1709580 |
| R2-1711819 | RRC signalling to support LTE+NR Co-existence<br>R2-1709504               | SAMSUNG Electronics Co., Ltd. | discussion |        |                           |

#### 10.4.2 LTE RRC changes for EN-DC

*No documents should be submitted to 10.4.2. Please submit to 10.4.2.x.*

*Note that changes to LTE RRCConnectionReconfiguration for configuring EN-DC will be discussed jointly with NR RRCConnectionReconfiguration in 10.4.1.3.1, and NR and :LTE aspects of SCG failure for EN-DC will be jointly discussed in 10.4.1.5.3.*

##### 10.4.2.1 Running CR

*This agenda item is relevant to EN-DC completion*

- |            |  |                            |    |  |                           |
|------------|--|----------------------------|----|--|---------------------------|
| R2-1711505 | Introducing support for NR (draft running CR to 36.331)<br>Rel-15 36.331 14.4.0 3115 - B | Samsung Telecommunications | CR |  | NR_newRAT-Core R2-1709488 |
|------------|--|----------------------------|----|--|---------------------------|

- Samsung clarify that it captures agreements for SA and EN-DC.
- => Comments invited on agreements that have been missed or aspects that have not yet been agreed.
- => Other comments can also be provided offline.
- => Separate into 2 CRs. One for EN-DC and common aspects, and one for the additional aspects to support interworking with NR SA.
- => Also to be updated to capture agreements from this meeting (included agreed TPs).

- [99bis#26][NR] LTE RRC running CRs (Samsung)**  
Intended outcome: 2 running CRs for LTE RRC  
Deadline: Thursday 2017-11-09

- |            |  |          |            |      |
|------------|--|----------|------------|------|
| R2-1711128 | CR for TS 36.331 - general changes to support EN-DC<br>15 NR_newRAT-Core | Ericsson | discussion | Rel- |
|------------|--|----------|------------|------|
- => Aspects can be input to the email discussion.

##### 10.4.2.2 RRM measurements

*Introduction of inter-RAT NR measurements within LTE RRC.*

*This agenda item is relevant to EN-DC completion.*

- |            |   |                             |  |        |
|------------|---|-----------------------------|--|--------|
| R2-1710436 | Discussion on requirement of measurement in E-UTRAN<br>discussion | ZTE Corporation, Sane Chips |  | Rel-15 |
|------------|---|-----------------------------|--|--------|

- Ericsson think it could be a subset of what is NR, for example CSI-RS. IDC agree with Ericsson.
- Qualcomm also has some concern and think the LTE measurement gap may not be long enough.
- Ericsson explain that the B events don't currently consider cell specific offsets.
- DOCOMO think the MN needs to convert the measurements from LTE to NR RRC format in order to provide then to the SN.

Agreements

- 1 NR measurement reporting in LTE will follow NR RRC decisions but may not include all parameters (e.g. CSI-RS measurements would not be included).
- FFS: Whether the white list is supported.
- 2 For inter-RAT measurement on NR frequency configured by E-UTRAN, UE can report on detected cells.
  - 3 Frequency specific offset is supported for NR measurement in LTE
  - 4 Cell specific offset will not be supported for NR measurement in LTE
  - 5 LTE Inter-RAT measurement report that includes SSB based beam measurement results should be encoded in LTE RRC format.

R2-1710668 LTE Measurement Reports for EN-DC InterDigital discussion Rel-15 NR\_newRAT-Core

- Samsung wonder whether all NR serving cells are needed or whether PSCell is sufficient.
  - LG think the MN initiated SN change is only for load balancing and hence the NR serving cell do not need to be included.
  - Intel support the proposal and think the MN can configure independent measurements if needed. OPPO share this view and support the proposal. Huawei also support the proposal.
  - ZTE share the view of LG that this is not needed.
  - Nokia think for inter MN handover case there is value so the target MN can decided whether to keep or release the SN and hence would like them for A events. Ericsson share this view and think it could be configurable by the network. Intel think the MN can still get the information if it is really required. Samsung see the LTE DC case was very different as the MN was responsible for all SN configuration.
- => Offline discussion to conclude on when NR serving cell measurements are provided (Offline discussion #35, IDC). Outcome in R2-1712057

R2-1712057 Summary of offline discussion [#35] to conclude on when NR serving cell measurements are provided Interdigital

Agreements

- 1: The UE can report NR serving cell measurements in Bx events related to NR measurements.
  - 1.1: The NR serving cell measurements included in Bx events include both PSCell and SCell.
  - 3: The UE includes ARFCN and PCI of the NR serving cells to identify the NR serving cell measurements. SCellIndex is not used for this purpose. (May be revisited depending on the outcome of the discussion the uniqueness of the SCell index)
- FFS: The UE does not send NR serving cell measurements in measurement reports associated with LTE Ax events or in periodic measurement reports.

R2-1711120 SSTD measurements for EN-DC NTT DOCOMO, INC. discussion Rel-15 NR\_newRAT-Core

- Intel think this may not be so critical for first release of EN-DC especially considering that it is only needed for asynchronous. DOCOMO explain that the SI agreed that EN-DC will support both sync and async.
- NEC support to have this from the start of EN-DC.
- Intel think that UE support of async and sync capability may be needed.
- Ericsson wonder if his could also be reported for cells that are not yet configured. DOCOMO think this was discussed for LTE-DC and it was not done due to the gap required to read the MIB.

Agreements:

- 1: SSTD measurements for EN-DC are supported with the following principles (as in LTE):
  - a. MeNB can configure SFN/subframe offset reporting for PSCell only when EN-DC is configured.
  - b. UE only needs to read MIB to measure/report SFN/subframe offset.
  - c. MeNB forwards the SFN/subframe offset from MeNB to SgNB using "SCG-ConfigInfo" (FFS on IE name).
  - d. One shot reporting (i.e. eNB configures measurement and UE sends single report to eNB, not periodical).
- 2 The definition of LTE SSTD is reused for NR (to be confirmed by RAN4).
- 3 Attempt to introduce in LTE RRC by reusing the reporting for LTE DC.

FFS: Whether to extend SSTD measurement reporting for cells that are not yet configured.

- R2-1711121 [DRAFT] LS on SSTD measurements for EN-DC NTT DOCOMO, INC. LS out Rel-15  
NR\_newRAT-Core  
- Intel think we should also ask if RAN4 sees any issues from their point of view  
=> Revised in R2-1711985 (Offline discussion #36)
- R2-1711985 [DRAFT] LS on SSTD measurements for EN-DC NTT DOCOMO, INC. LS out Rel-15  
NR\_newRAT-Core To:RAN4 Cc:RAN1  
=> Change final sentence of action to "whether the RAN2 reporting can be reused as it is".  
=> Approved in R2-1712029
- R2-1710238 Discussion on NR Events Configuration in EN-DC OPPO discussion
- R2-1710362 Inter-RAT measurement for EN-DC Fujitsu discussion Rel-15 NR\_newRAT-Core
- R2-1710619 Measurement reporting of NR serving cells in EN-DC Intel Corporation discussion  
Rel-15 NR\_newRAT-Core
- R2-1710809 Inter-RAT measurement of NR in LTE LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1708899
- R2-1710863 Remaining issues for inter-RAT measurements from LTE to NR MediaTek Inc. discussion
- R2-1711097 Consideration on inter-RAT measurement in EN-DC Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core
- R2-1711129 TP for TS 36.331 - inter-RAT NR measurements Ericsson discussion Rel-15  
NR\_newRAT-Core
- R2-1711298 Inter-RAT Measurement Framework Samsung R&D Institute India discussion
- R2-1711299 Measurement Gap Configuration for EN-DC Samsung R&D Institute India discussion
- R2-1711459 Support of reportOnLeave for E-UTRA B1 and B2 Nokia, Nokia Shanghai Bell discussion  
Rel-15 NR\_newRAT-Core
- R2-1711460 36.331 CR: Support of reportOnLeave for E-UTRA B1 and B2 Nokia, Nokia Shanghai Bell  
CR Rel-15 36.331 14.4.0 3109 - B NR\_newRAT-Core
- R2-1710936 Remaining measurement event for EN-DC vivo discussion Rel-15 NR\_newRAT-Core  
R2-1708408  
*Moved from 10.4.1.4.4 to 10.4.2.2*
- R2-1711130 Inclusion of NR SN serving cell measurements in LTE measurement reports Ericsson  
discussion Rel-15 NR\_newRAT-Core  
*moved from 10.4.1.4.6 to 10.4.2.2*
- R2-1710855 NR SN serving cell measurements in LTE measurement reports Nokia, Nokia Shanghai Bell  
discussion Rel-15 NR\_newRAT  
*moved from 10.2.4 to 10.4.2.2*
- R2-1710276 Measurement results of serving cells CATT discussion Rel-15 NR\_newRAT-Core  
R2-1707886  
*moved from 10.2.4 to 10.4.2.2*

### 10.4.2.3 Other

*Including the NR indication in LTE system information, etc*

*This agenda item is relevant to EN-DC completion.*

- R2-1710512 Introducing 5G indication in LTE RRC SIB Ericsson discussion Rel-15 NR\_newRAT-Core  
- DOCOMO think we agreed it is not related to AS functionality and hence wonder whether we need it at all. Think the presence of the new SIB for idle mode mobility might be sufficient. SIB could be empty if the reselection to NR SA is not supported.  
=> Can be discussed again when we have received confirmation that the 5G indication is needed.
- R2-1711135 Tunneling of NR RRC messages via LTE Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1710119 How to implement an NR indicator in LTE system information NTT DOCOMO, INC.  
discussion Rel-15 NR\_newRAT-Core
- R2-1710694 Fast DC configuration in EN-DC MediaTek Inc. discussion Rel-15 NR\_newRAT-Core  
R2-1708271

### 10.4.3 UE capabilities

*No documents should be submitted to 10.4.3. Please submit to 10.4.3.x.*

#### 10.4.3.1 Decoupling UL/DL bands

*Output from email discussion [99#24][NR] Decoupling DL band and UL bands (Intel)*

*This agenda item is relevant to EN-DC completion and SA.*

*Maximum 1 tdoc per company*

- R2-1710609 Email discussion report on [99#24][NR] Decoupling DL band and UL bands Intel Corporation  
discussion Rel-15 NR\_newRAT-Core  
=> Noted
- R2-1710691 Further analysis on decoupling DL and UL bands Intel Corporation discussion Rel-15 NR\_newRAT-Core  
- DOCOMO think in the email most companies preferred approach 1 and think this could be a viable option. Think it also depends whether the some things such as MIMO capability is included in the BC.  
- Intel think we need to consider if option 3 has a problem with duplicating capabilities. The MIMO aspects needs to be discussed based on other email but think MIMO should be in the BC.  
=> Comeback to discussion after other capability discussion  
- Update from offline: Other discussions have not progressed enough to continue this discussion.  
=> Can be discussed as part of the UE capability email discussion.

#### 10.4.3.2 UE capability structure

*Including output from email discussion [99#25][NR] Capability coordination, Part 1 (Intel)*

*Including output from email discussion [99#26][NR] Capability coordination, Part 2 (DOCOMO)*

*This agenda item is relevant to EN-DC completion and SA.*

*Maximum 1 tdoc per company*

R2-1710632 Email Disc on [99#25][NR] Capability coordination - Part 1 Intel Corporation discussion  
Rel-15 NR\_newRAT-Core

- Agreements
- 1 MR-DC band combination consists of list of MR-DC band combination parameter(s) and each MR-DC band combination parameter consists of list of band parameter(s) where each band parameter is chosen from CHOICE of LTE and NR band.
  - 2 MR-DC band combination is signalled as a separate container from LTE and NR capability container and both nodes need to interpret the container.
  - 2a MN can request that the UE provides this container (separate request from the request for UE to provide other RAT capabilities)
  - 3 MR-DC band combination is specified in NR RRC.
  - 4 The ASN.1 example shown in the paper can be considered as starting point (EN-DC corrected to MR-DC)
  - 5 The table (without conclusion, i.e. "X", and possibly with some table format change) is to be maintained by the spec rapporteur and updated according to the related discussion and decision.

- [99bis#27][NR] L2/3 capabilities (Intel)**  
Progress the L2/3 capability table from email discussion#25. Aim to progress which features are baseline, which need IOT or capability bits, etc  
Intended outcome: Report to next meeting  
Deadline: Thursday 2017-11-09
- [99bis#28][NR] UE capability ASN.1 structure (Intel)**  
Progress the ASN.1 structure for UE capabilities in NR and LTE RRC spec and the corresponding field descriptions.  
Intended outcome: TP to next meeting  
Deadline: Thursday 2017-11-09

R2-1710115 Summary of email discussion [99#26][NR] Capability coordination - Part 2 NTT DOCOMO, INC.  
(Email discussion rapporteur) report Rel-15 NR\_newRAT-Core

P1

- Intel think that RAN1/4 still consider that MIMO is an RF capability and so should be in the BC and also in the baseband capabilities. The MIMO capability in the baseband capabilities is indicate for other purpose for the calculation of the intended baseband processing capability.
- Samsung think there are different views on how dependent the MIMO capability is on the BC.
- Qualcomm think it would be OK to indicate the MIMO capability per band but not needed per BC. The signalling per BC would be allowed for exceptional cases.
- Ericsson would prefer to go for MIMO in the baseband combination and per band if that is possible. Concern with signalling per BC is that it will again lead to huge sizes.
- Intel think the MIMO capability per BC would only be signalled if different from the MIMO capability per band.

- Agreements
- 1 UE can report the number of MIMO layers per band
  - 2 The concept of baseband capability combination is applied at least for the LTE part of EN-DC. (Whether to apply for LTE only operation can be discussed separately under TEI15 after it is stable for EN-DC)
  - 3 The fallback mechanism similar to Rel-14 LTE CA is considered for the baseband processing combination signaling. Details are FFS.

=> Offline discussion to progress on P1 (The UE reports the MIMO capability as part of the baseband processing capabilities) and P3 (Proposal 3: For a certain band combination, if the supported MIMO capability is different from the one for the baseband and single frequency band, the UE can report the different MIMO capability per CC in the band combination signalling) (Offline discussion #32, DOCOMO)

R2-1712007 Outcome of offline #32; MIMO capability reporting in BPC and BC NTT DOCOMO, INC.  
discussion Rel-15 NR\_newRAT-Core

Working assumption:

- 1 The UE reports the MIMO capability per CC as part of the baseband processing capabilities.
- 2 The MIMO capability is not included in the band combination signalling.

=> ASN.1 example in the documents can be a starting point in the UE capability email discussion

=> Draft LS to inform RAN1/4 of our agreements and working assumption. Ask them for any feedback and ask them to take it into account when providing their feature lists. Draft LS in R2-1712048

☒ **[99bis#05][NR] UE capabilities LS (DOCOMO)**

Intended outcome: Approved LS

Deadline: Thursday 2017-10-26

=> The LS is approved in R2-1712078

R2-1710342 Capability design for SA NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

R2-1710690 Baseband processing capability structure for NSA Intel Corporation discussion Rel-15 NR\_newRAT-Core

### 10.4.3.3 UE capability coordination

*Output from email discussion [99#27][NR] Capability coordination, Part 3 (Nokia)*

*This agenda item is relevant to EN-DC completion.*

*Maximum 1 tdoc per company*

R2-1710860 Email discussion summary for [99#27][NR] Capability coordination, Part 3 Nokia, Nokia Shanghai Bell report Rel-15 NR\_newRAT

- Nokia explain that this is described for SN addition but can be extended also to reconfiguration cases.
  - Samsung think it should be left to the network to decide when to coordinate again after a reconfiguration within one node.
  - Samsung ask if the SN can initiate this. LG think this should only be done by the MN.
- P2
- DOCOMO ask why the expected data rate it needed. Nokia think the network only know the BPC of its own node so it can not determine the data rate that may be provided by the other node. See it can reduce back and forth negotiation.
  - ZTE think this looks like a dynamic parameter.
  - Qualcomm still has some confusion how this would be used.

#### Agreements

- 1 The MN decides the LTE (resp NR) part of BC and BPC and provide SN indicating its choice of LTE (resp NR) part and SN continues further to determine the set of supportable NR (resp LTE) BCs and NR (resp LTE) BPC and then select an NR BC (resp LTE) and NR BPC (resp LTE)
  - 1i Similar process can be initiated by the SN as a request as part of SN initiated reconfiguration. MN may reject the request.

R2-1711560 MR-DC UE capability dependency and coordination Qualcomm Incorporated discussion Rel-15 NR\_newRAT

- DOCOMO assumed that the LTE baseband capability would be in the MR DC band combination container otherwise it could be used for LTE only operation. If it is applied for standalone then it could be moved.

- Intel think for the BPC case it should be ok to use the index approach. This will increase the BPC overhead due to additional fallback combinations if we go for the index approach. The BPC could be included in the MR DC container.
  - Huawei wonder how this approach can work for the shared capabilities. This is why it adds additional overhead. It adds more BPC combinations for the shared capabilities.
  - Nokia think we should think about it when we know which capabilities are shared between LTE and NR.
- => Offline discussion to try to progress on the next level of detail on how the coordination works (Offline discussion #33, Qualcomm)

R2-1712043 Summary for offline discussion #33 on the next level of detail on MR-DC UE capability coordination Qualcomm

- Agreements
- 1: The concept of baseband capability combination is applied at least for the LTE part of MR-DC. (the same agreement for EN-DC from discussion on R2-1710115 also applies to MR-DC).
  - 2: Multiple combinations of LTE-NR baseband capabilities may be applicable per MR-DC band combination
  - 3: Baseband capability combinations for LTE and NR applied for MR-DC are signalled in the UE capability of each RAT
  - 4: "Dependency" of LTE and NR baseband capability combinations is signalled
- FFS Whether this is in the "MR-DC capability container" or in the individual RAT capabilities
- => Details can be progressed as part of the capabilities email discussion

#### 10.4.3.4 Other aspects for EN-DC

*Any other aspect related to UE capabilities relevant for EN-DC*

*This agenda item is relevant to EN-DC completion.*

- R2-1710116 TP on UE capability structure and retrieval procedures NTT DOCOMO, INC. pCR Rel-15 38.331 0.0.5 NR\_newRAT-Core
- => TPs can be updated to take into account any agreements from this meeting, consistency with previous agreements checked, and be used as starting point in the email discussion.
- R2-1710612 Further consideration on peak data rate calculation Intel Corporation discussion Rel-15 NR\_newRAT-Core
- Ericsson think we should aim to have this only in the baseband capabilities.
  - Qualcomm think modulation can be part of baseband capabilities.
  - LG think if MIMO is to be in the BC then modulation should also be in the BC.
- P3
- Ericsson think this is opposite of what was agreed last time and RAN1 and Ran4 indicated that it was possible. Intel don't intend to revert the agreement but propose an additional upper limit.
  - Samsung thinks this conflicts with the RAN decision that category is for marketing purposes only.
  - ZTE think for the DC case we previously agreed not to do this.
  - LG think this additional information is not required.
  - Intel think the achievable throughput should not be derived only the calculated peak data rate.

- Agreements
- 1 Modulation order is included in the BPC.

- R2-1711523 L2 Buffer Size capability Ericsson discussion Rel-15 NR\_newRAT-Core
- P2
- DOCOMO wonder if this DC requirement is required for UE supporting only SCG bearer.



- Qualcomm think we had an assumption how to split the max data rate between the MCG and SCG. Intel think we had some assumption on the split between MCG and SCG but for NR we may not need this as the data rate is separately determined on the 2 sides.
- Intel wonder how we determine the RTT and Xn delay. Think we can assume a smaller value than in LTE. DOCOMO think 50ms is assumed by UP session for NR side and SN lengths were designed on this assumption.
- Intel think that for LTE it was based on assumption on HARQ retransmission and RLC behaviour.
- Qualcomm think the buffer size is not needed for the network operation but is more for UE implementation guidance. DOOCOMO think the buffer size is important for network scheduling point of view.

Agreements

- 1 The same formula as in LTE is used to determine the required L2 buffer size in NR: Minimum L2 Buffer Size = MaxDLDataRate \* RoundTripTime + MaxULDataRate \* RoundTripTime (Calculated for highest rate NR BC)
- 2 The same formula as in LTE DC is used to determine the required L2 buffer size for split bearer operation in NR/MR-DC: MaxULDataRate \* RTT + MaxDLDataRate\_SeNB \* RTT + MaxDLDataRate\_MeNB \* (RTT + Xn delay + Queuing in SN) (Calculated for highest rate MR-DC BC)  
FFS RTT and Xn delay and queuing delay values.
- 3 Capture the formula for determining the L1 data rate and the formulas for determining the L2 buffer size (using the L1 data rate as input) in 38.306.

=> Draft LS to ask RAN1 to provide a formula or table for determining the L1 data rate from the UE's band combinations and baseband capabilities as proposed by RAN2-99 (Offline discussion #34, Ericsson). Draft LS in R2-1711983

R2-1711983 [DRAFT] LS on formula or table for L1 data rate Ericsson LS out Rel-15 NR\_newRAT-Core To:RAN1  
=> Remove "the UE does not need to signal a UE category explicitly (see previous RAN2 LS in R2-1709979) for DC supporting UEs. RAN1 and RAN4 confirmed this. Because of the agreement not to specify L1 peak data rates in categories, also"  
=> Remove "(as proposed by RAN2-99 in R2-1709979)."  
=> Approved in R2-1712026

R2-1711618 Total L2 buffer size calculation NTT DOCOMO INC. discussion Rel-15 NR\_newRAT-Core

#### 10.4.3.5 Temporary capability restriction

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Maximum 1 tdoc per company*

R2-1710344 UE temporary access capability restriction Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

R2-1710611 Temporary capability restriction Intel Corporation discussion Rel-15 NR\_newRAT-Core R2-1708788

R2-1710945 UE radio access capabilities change vivo discussion Rel-15 NR\_newRAT-Core R2-1708415

R2-1711521 UE Capability Restrictions Ericsson discussion Rel-15 NR\_newRAT-Core R2-1708033

#### 10.4.3.6 Other aspects for non EN-DC

*Any other stage 2 aspect related to UE capabilities relevant for non EN-DC cases*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710343	Network handling on UE static access capability	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1711420	NR UE Capability Size Reduction	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1709453
R2-1711504	Use of identifier representing NR UE capabilities, baseline	Samsung Telecommunications	discussion	Rel-15
R2-1711522	UE Capability Compression	Ericsson	discussion	Rel-15 NR_newRAT-Core R2-1708034
R2-1711561	Reducing the size of UE capabilities	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT R2-1707837
R2-1711745	UE capability retrieval framework in NR	NTT DOCOMO INC.	discussion	

#### 10.4.3.7 TS

*Latest 38.306, other rapporteur inputs, anything related to specification methodology.*

*This agenda item is relevant to EN-DC completion*

#### 10.4.4 Idle/inactive mode procedures

R2-1711205	Paging for wideband carrier in NR	Samsung	discussion	Rel-15
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##### 10.4.4.1 TS

*Latest 38.304, other rapporteur inputs, anything related to specification methodology. Please submit any new text proposals to the appropriate agenda item.*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1711588	New Generation Radio Access Network; User Equipment (UE) procedures in Idle mode	Qualcomm Incorporated	draft TS	Rel-15 38.304 0.0.5 NR_newRAT-Core R2-1709627
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##### 10.4.4.2 Selection/reselection rules

*Basic criteria and rules for cell selection and reselection*

*Maximum 1 tdoc per company*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710447	Cell selection and reselection criteria and measurement configuration	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1710466	Cell selection and reselection rules	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1710628	Further considerations for cell (re)selection	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1710726	Service based Inter-RAT cell reselection	China Telecom	discussion	
R2-1710946	Cell selection reselection in NR	vivo	discussion	Rel-15 NR_newRAT-Core R2-1708431
R2-1711591	Discussion on cell (re)selection while the beam number is less than N	HTC Corporation, Mediatek	discussion	Rel-15 NR_newRAT-Core R2-1708315
R2-1711716	Cell Selection/Reselection method for NR IDLE mode	Samsung Electronics	discussion	

R2-1711059 Cell selection and reselection for NR IDLE - cell selection/reselection criteria Nokia  
 discussion Rel-15 NR\_newRAT-Core R2-1708476  
*moved from 10.4.2.2 to 10.4.4.2*

#### 10.4.4.3 Cell quality derivation

*Derivation of cell quantity from beam measurements (including filtering and FFS points from previous meetings)*

*Maximum 1 tdoc per company*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710444 Cell quality derivation for idle/inactive UEs Ericsson discussion Rel-15 NR\_newRAT-  
 Core R2-1708579

R2-1710467 Derivation of cell quality in IDLE/INACTIVE Huawei, HiSilicon discussion Rel-  
 15 NR\_newRAT-Core R2-1708076

R2-1710629 Cell quality derivation for idle mobility Intel Corporation discussion Rel-15  
 NR\_newRAT-Core R2-1708817

R2-1710807 Cell quality derivation in IDLE/INACTIVE LG Electronics Inc. discussion Rel-15  
 NR\_newRAT-Core R2-1708898

R2-1710947 Cell quality derivation in idle inactive modevivo discussion Rel-15 NR\_newRAT-Core  
 R2-1708430

R2-1711442 Cell Quality Derivation for Cell ReselectionConvinda Wireless LLC discussion Rel-15  
 NR\_newRAT-Core

R2-1711715 Cell quality derivation method for NR IDLE mode Samsung Electronics discussion

R2-1711058 Cell selection and reselection for NR IDLE - cell quality derivation Nokia discussion Rel-  
 15 NR\_newRAT-Core R2-1708475  
*moved from 10.4.2.3 to 10.4.4.3*

#### 10.4.4.4 Service based reselection

*Maximum 1 tdoc per company*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710104 Cell Re-selection: Service Specific Frequency Prioritisation in NR Samsung R&D Institute India  
 discussion Rel-15 NR\_newRAT-Core R2-1707687

R2-1710469 Service-based camping Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1708077

R2-1710484 Service-based RAT/frequency selection in INACTIVE or in IDLE [2]Ericsson discussion  
 Rel-15 NR\_newRAT-Core R2-1708174

R2-1710630 Service based cell reselection Intel Corporation discussion Rel-15 NR\_newRAT-  
 Core R2-1708818

R2-1710813 Service based cell reselection LG Electronics Inc. discussion Rel-15 NR\_newRAT-  
 Core R2-1708904 To:SA2

R2-1711769 Service-based cell reselection discussion ITRI, ASUSTeK discussion NR\_newRAT-Core  
 R2-1709078

#### 10.4.4.5 Selection/reselection - other aspects

*Including, for example mobility states, speed dependent scaling, forward compatibility for CSG, cell reservations, etc*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710448	Mobility states and state based scaling Core R2-1709299	Ericsson	discussion	Rel-15	NR_newRAT-
R2-1710449	Considering the number of good beams for cell reselection 15 NR_newRAT-Core	Ericsson	discussion	Rel-	
R2-1710450	Cell reselection measurement rules Core	Ericsson	discussion	Rel-15	NR_newRAT-
R2-1710451	Cell selection and reselection rules for inactive UEs 15 NR_newRAT-Core	Ericsson	discussion	Rel-	
R2-1710452	Cell-specific prioritisation at reselection Core	Ericsson	discussion	Rel-15	NR_newRAT-
R2-1710468	Speed dependent mobility for idle mode NR_newRAT-Core R2-1708078	Huawei, HiSilicon	discussion	Rel-15	
R2-1710470	Cell reservation and forward compatibility for CSG in N Rel-15 NR_newRAT-Core	Huawei, HiSilicon	discussion		
R2-1710475	Camping in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core R2-1708176
R2-1710476	CSG-like selection and camping limitations in NR NR_newRAT-Core R2-1708175	Ericsson	discussion	Rel-15	
R2-1710805	Cell Barring and Reservations for NR	Qualcomm Incorporated	discussion		R2-1709633
R2-1710806	CSG Type Functionality for NR R2-1709630	Qualcomm Incorporated, Deutsche Teleko	discussion		
R2-1710948	Consideration on forward compatibility R2-1708432	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1711646	NR forward compatibility issue for CSG R2-1709279	LG Electronics Inc.	discussion	Rel-15	R2-
R2-1711648	Idle Measurement Enhancement using UE speed 15 R2-1709281	LG Electronics Inc.	discussion	Rel-	
R2-1711722	Speed dependant parameters in NR IDLE and INACTIVE mode mobility discussion	Samsung Electronics			

#### 10.4.4.6 Idle/inactive paging

*Including beam related aspects, response driven paging and calculation of paging occasion.*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1710097	Paging in NR – Beamforming Aspects 15 NR_newRAT-Core R2-1707688	Samsung R&D Institute India	discussion	Rel-	
R2-1710101	PO Determination for Paging Reception 15 NR_newRAT-Core R2-1707689	Samsung R&D Institute India	discussion	Rel-	
R2-1710290	Issues for Paging Occasion	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1710340	Reply LS on NR Paging Occasion	Samsung R&D Institute India	LS out	Rel-15	NR_newRAT-
R2-1710425	Calculation of paging occasion in NR 15	ZTE Corporation, Sane Chips	discussion	Rel-	
R2-1710426	Paging occasion mechanism comparision 15	ZTE Corporation, Sane Chips	discussion	Rel-	
R2-1710427	Overhead Reduction for Paging in Multi-beam Operation discussion Rel-15	ZTE Corporation, Sane Chips			
R2-1710445	Delivery of paging messages	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1710446	Response-driven paging to reduce beam sweeping overhead in NR discussion Rel-15 NR_newRAT-Core	Ericsson			
R2-1710540	Definition of Paging Frame and Paging Occasion 15 R2-1708216	Huawei, HiSilicon	discussion	Rel-	

R2-1710541	Efficiency of direct and response-driven paging	Huawei, HiSilicon	discussion	Rel-15	R2-1709662
R2-1710631	Calculation of paging occasion	Intel Corporation	discussion	Rel-15	NR_newRAT-Core R2-1708819
R2-1710678	Paging In High Frequency InterDigital		discussion	Rel-15	NR_newRAT-Core R2-1708745
R2-1710679	Paging Indicator Details	InterDigital	discussion	Rel-15	NR_newRAT-Core R2-1708746
R2-1710793	Consideration on NR paging	Qualcomm Incorporated	discussion		R2-1709642
R2-1710798	Use of multiple P-RNTIs for NR paging	Qualcomm Incorporated	discussion		R2-1709641
R2-1710802	NR Paging Occasion for Paging DCI and Paging Message	MediaTek Inc.	discussion		
R2-1710803	Draft Reply LS on NR Paging Occasion	MediaTek Inc.	discussion		
R2-1710979	Discussion on downlink overhead reduction for NR paging	ASTRI, TCL Communication Ltd.	discussion		
R2-1710985	Discussion on response beam selection in indication-based paging	ASTRI, TCL Communication Ltd.	discussion		
R2-1711046	Providing more information relating to MT data in Paging	Beijing Xiaomi Mobile Software	discussion	Rel-15	R2-1709178
R2-1711367	DRX in idle state	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711368	DRAFT LS on maximum DRX value for NR in Release 15	Ericsson	LS out	Rel-15	NR_newRAT-Core
R2-1711369	Configuration of paging transmissions in multi-beam operation	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1711386	CN paging DRX in RRC_IDLE	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core R2-1708456
R2-1711397	Discussion on NR paging occasion (for response to RAN1)	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1711425	UE Assisted Paging	Convida Wireless LLC	discussion	Rel-15	NR_newRAT-Core
R2-1711501	Paging mechanism with beam sweeping	Huawei Technologies France	discussion	Rel-15	NR_newRAT-Core R2-1709554

## 11 Comebacks

*This agenda item will be used during the meeting. No documents are supposed to be submitted by delegates.*

### 11.1 Breakout sessions

#### 11.1.1 Report from Break-Out session

*Report from session on Rel-14 and Rel-15 LTE*

- R2-1711833 Report from Break-Out Session, Vice-Chair (CMCC)  
 CBF: Report from LTE Break-Out Session, Vice-Chair (CMCC)  
 => Approved

#### **feMBMS:**

- R2-1711944 Draft reply LS in to RAN1 to indicate our in principle agreed CR. (Offline discussion#100 Qualcomm)  
 => Approved in R2-1712058

#### **QMC:**

- R2-1711945 Draft a LS to RAN3, CT1, SA4 and SA5 by including RAN2 progresses (Offline#101, Huawei).

=> Approved in R2-1712035

**euCA:**

**CB:** => LS is sent to request RAN4 to define measurements requirements if any for the measurement Draft LS in R2-1711946. (Offlien#111,Nokia)

R2-1711946 Draft LS to RAN4 on RAN2 agreements for enhanced CA utilization WIDNokia

=> Approved in R2-1712060

**AUL:**

**CB:** => Draft LS in R2-1711949 to RAN1 to inform our progress. Highlight the agreement 4 which is not aligned with RAN1 agreements. (offline discussion #666, Ericsson)

R2-1711949 LS on RAN2 agreements for Rel-15 LAA RAN1 Ericsson

=> Approved in R2-1712059

## 11.1.2 Report from Break-Out session

*Report from session on Rel-13/14 NB-IoT, Rel-13/14 MTC, Rel-15 NB-IoT WIs*

R2-1711834 Report from Break-Out Session, Session Chair (MediaTek)

CBF: Report from LTE Break-Out Session, Vice-Chair (MediaTek)

=> Regarding the prioritised NB-IOT features chair will coordinate with other WG chairs and the RAN chair to ensure a consistent approach for providing these docs to RAN (as draft CRs, or tech endorsed CRs, or agreed CRs).

=> Approved

## 11.1.3 Report from Break-Out session

*Report from session on Rel-14 LTE and NR UP*

R2-1711835 Report from Break-Out Session, Vice-Chair (InterDigital)

CBF: Report from LTE Break-Out Session, Session Chair (InterDigital)

=>Approved

*Comebacks:*

**For EN-DC the assumption is that the cell index space is shared between LTE and NR. [CB for CP]**

- LG is concerned about coordination with the share index space.
- Samsung think the main issues is that the index needs to be unique across the cell groups. Assume it would just be a hard split between MCG and SCG.
- Ericsson CP think the RRC has assumed that they are independent.

=> To be discussed offline (Offline discussion #50, Vivo)

- Update from offline: Bot possible to conclude at this meeting

=> Postponed to next meeting. Contribution next time should provide details of MAC PHR format and text proposal.

R2-1711845 UE capabilities for Tx antenna selection Qualcomm IncorporatedCR Rel-13 36.331  
13.7.0 3080 - F LTE\_CA\_TDD\_FDD-Core

[CB #300]

=> Postponed to next meeting

R2-1711846 UE capabilities for Tx antenna selection Qualcomm IncorporatedCR Rel-13 36.306  
13.7.0 1510 - F LTE\_CA\_TDD\_FDD-Core

[CB #300]

=> Postponed to next meeting

- R2-1711512 UE capability, retrieval of fallback combinations Samsung Telecommunications CR Rel-14 36.331 14.4.0 3117 - F LTE\_CA\_enh\_b5C-Core, TEI14  
 [CB – if there is a possibility for this problem to happen and if a clarification is needed  
 [CB #302]  
 => Agreed in principle
- R2-1711444 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm Incorporated CR Rel-13 36.331 13.7.0 3106 1 F LTE\_SC\_PTM-Core  
 [CB #301]  
 => Agreed in principle
- R2-1711453 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm Incorporated CR Rel-14 36.331 13.7.0 3106 1 F LTE\_SC\_PTM-Core  
 => Agreed in principle
- R2-1711849 Clarification on LPP Message size due to limitations at the lower layers Intel Corporation CR R2-1711475 Rel-14 36.305 14.3.0 LCS\_LTE  
 [CB #303]  
 => Postponed to next meeting.
- R2-1711869 Draft LS on RA preamble power ramping counter update Samsung R&D Institute India LS out R2-1711855 Rel-15 NR\_newRAT-Core  
 [CBF #310]  
 => Approved in R2-1712061
- R2-1711872 [Draft] LS to RAN1 on RAN2 agreements related to BWP Huawei LS out  
 [CB #325]  
 => Add 'on top of DCI'  
 => Approved in R2-1712046
- R2-1711867 Draft LS on RAN2 agreements related to Scell activation/Deactivation Oppo LS out  
 [CB #321]  
 => Approved
- R2-1711868 [DRAFT] LS on RAN2 agreements related to PHR Samsung  
 [CB]  
 => Remove agreement 11  
 => Approved in R2-1712065

## 11.1.4 Report from Break-Out session

*Report from session on Rel-15 MTC*

- R2-1711836 Report from Break-Out Session, Session Chair (Ericsson)  
 CBF: Report from LTE Break-Out Session, Session Chair (Ericsson)  
 => Approved

## 11.1.5 Report from Break-Out session

*Report from session on Rel-15 Positioning WI*

- R2-1711837 Report from Break-Out Session, Session Chair (Huawei)  
 CBF: Report from LTE Break-Out Session, Session Chair (Huawei)  
 => Approved

**Comeback on Friday**

R2-1711958 Draft LS on provisioning of positioning assistance data via LPPa for broadcast Ericsson  
(NOTE: The content of CB 501 was changed after the session based on the offline discussion)  
=> Approved in R2-1712030

R2-1711959 Draft LS on encoding and encryption of positioning assistance data Ericsson  
=> Approved in R2-1712031

### 11.1.6 Report from Break-Out session

*Report from session on Rel-15 V2X WI*

R2-1711838 Report from Break-Out Session, Session Chair (Intel)  
CBF: Report from LTE Break-Out Session, Session Chair (Intel)  
=> Approved

**[CB: 600]** R2-1711995 LS to RAN1 on the agreements on carrier and resource selection in CA (LG)  
=> Approved in R2-1712032

## 11.2 Main session

*This section contains a temporary list of comebacks (press F9 to update while the cursor is inside the list).*



- ☞ => Capture the problem in the specification and that UE implementations are expected to handle it in some way. Wording and spec in which it is captured to be progressed offline. Offline discussion #02 (DOCOMO)
- ☞ => Offline discussion whether a UE based solution is also feasible and beneficial (Offline discussion #03, Qualcomm)
- ☞ => Revised in R2-1712039
- ☞ => Revised in R2-1712040
- ☞ => LS to SA2/CT4 to ask if the 5G S-TMSI size will be the same as in EPC and also ask if the S-TMSI space will be shared between 5G and EPC. Draft LS in R2-1712003 (Offline discussion #43, Ericsson). Can include both NR and eLTE WI codes.
- ☞ => Revised in R2-1711972
- ☞ => Discuss offline whether to add 2C support into the stage 2 description, or to add restriction into the stage 3 that 2C cannot be configured. (Offline discussion #14, ZTE)
- ☞ => Offline discussion to see how to conclude on P2 onwards (Offline discussion #17, DOCOMO)
- ☞ => Draft LS to SA3 and SA2 to inform them of the concern that has been identified and that it could be addressed by limiting DRB IP to lower rate services. Inform them that the RAN plenary guidance was to complete the hardware impacting parts of L2 by Dec 17. Draft LS in R2-1712013 (Offline discussion #47, Qualcomm)
- ☞ => Offline to progress the FFS and to try to conclude between the 2 options. Can consider any RAN1 progress made during this week. (Offline discussion #22, Huawei)
- ☞ => Draft LS in R2-1712016 (Offline discussion #48, Intel)
- ☞ Come back for outcome of offline session on specification methodology
- ☞ => Revised in R2-1711967 (Offline discussion #25). Aim is that the TP will be included into the TS after Friday.
- ☞ => TP revised in R2-1711968 (Offline discussion #27). Aim is that the TP will be included into the TS after Friday.
- ☞ => Send an LS to SA3 to check whether there is any security concern with proposal 1 and 2 e.g. due to DoS attack (i.e. rejection to INACTIVE by a fake gNB multiple successive times, and/or with long wait time) and replay attack (i.e. UE transmitting the same MAC-I multiple times). Can check is similar question was asked in relation to light connection and if so then reference the previous LS. Draft LS in R2-1712019 (Offline discussion #49, Intel)
- ☞ => Offline discussion to progress the FFS on filter coefficients. (Offline discussion #30, MediaTek)
- ☞ => Revised in R2-1711971 (Offline discussion #31). Aim is that the TP will be included into the TS after Friday.
- ☞ - New documents?
- ☞ => Offline to look at text in TP and conclude whether RS type for serving cell measurements should be configurable. Also look at agreement 6 from discussion of R2-1711963 to see if it needs to be reworded. (Offline discussion #39, Ericsson). In R2-1712047
- ☞ => TP revised in R2-1711989 (Offline discussion #40)
- ☞ => Revised on R2-1712009 (Offline discussion #44)
- ☞ => Revised in R2-172010 (Offline discussion #45)
- ☞ => Draft LS to RAN1 to inform them of our decision that RAN2 needs 2 bits plus one spare bit. Draft LS in R2-1712011 (Offline discussion #46, Qualcomm)

- ☞ => Offline discussion to conclude on when NR serving cell measurements are provided (Offline discussion #35, IDC)
- ☞ => Offline discussion to try to progress on the next level of detail on how the coordination works (Offline discussion #33, Qualcomm)
- ☞ **CB:** => Draft reply LS in R2-1711944 to RAN1 to indicate our in principle agreed CR. (Offline discussion#100 Qualcomm)
- ☞ **CB:** => LS is sent to request RAN4 to define measurements requirements if any for the measurement Draft LS in R2-1711946. (Offlien#111,Nokia)
- ☞ **CB:** => Draft LS in R2-1711949 to RAN1 to inform our progress. Highlight the agreement 4 which is not aligned with RAN1 agreements. (offline discussion #666, Ericsson)
- ☞ CBF: Report from LTE Break-Out Session, Vice-Chair (MediaTek)
- ☞ => To be discussed offline (Offline discussion #50, Vivo)
- ☞ CBF: Report from LTE Break-Out Session, Session Chair (Ericsson)
- ☞ => Offline discussion to try to progress the DRBs for NR (Offline discussion #38, Samsung)
- ☞ => Revised in R2-1711986 (Offline discussion #37)
- ☞ => Revised in R2-1711933 (Offline discussion #10, Intel)

## 12 Outgoing LSs

*Draft LSs should be submitted to their corresponding agenda item if there is one. If there is no appropriate agenda item, draft LSs may be submitted to this agenda item.*

*Reply to SA2 on number of DRBs*

- |            |  |                   |            |
|------------|--|-------------------|------------|
| R2-1710653 | Discussion related to LS on Number of DRBs supported<br>Rel-15 TEI15                         | Intel Corporation | discussion |
| R2-1710106 | On extension of the number of dedicated radio bearers for E-UTRAN<br>discussion Rel-15 TEI15 | Samsung           |            |
- Discussed jointly with previous paper.
  - Samsung consider that the MAC can just use the reserved values for the new logical channel IDs. Intel explain there are 7 spare values and all would be used up if we added the extra DRBs so then MAC would have to be extended.
  - Vodafone think that there are more spare values in the UL. Think the most we could do without impact in NAS is 11. More DRBs would have a price. Samsung agree that a change up to 11 almost comes for free.
  - Vodafone think we need to be very careful before we use all the spare values.
  - AT+T think that we need to expand beyond 8 to 15.
  - T-Mobile support AT+T on the need to expand to 15.
  - Qualcomm share the concern about using all the spare values - they are also used for MAC CE, new CCCH type, etc. If we go to 15 we will need to expand the logical channel identities.
  - LG think some spare values must be kept for other purposes. Lenovo wonder if the 15 will be the maximum or might increase again in future.
  - CMCC is not sure that we really need to many DRBs.
- => Respond that it is feasible to extend to 15 in Rel-15. This would have some implication in RAN2 specs to extend the MAC header to support more logical channel which has an overhead impact. A number lower than [14] might enable more DRBs to be supported without having to extend the MAC header.
- => If extended then the AS capability to support more DRBs will also need to be visible in the CN.
- => Supporting flexible combinations of number of AM and UM bearers is feasible. Increasing it will require capability signalling.

- R2-1710072 On the number of DRBs for NR Samsung discussion Rel-15 NR\_newRAT-Core
- Vodafone think we should have the same number on all technologies.
  - T-Mobile wonder if 32 is the correct number is we have slicing.
- => Respond that the previous comment on LTE is also applicable for EN-DC  
=> Respond that for NR SA, it is too early to conclude the number of DRBs supported.  
=> Offline discussion to try to progress the DRBs for NR (Offline discussion #38, Samsung)
- R2-1712033 Summary of the offline discussion on the number of DRBs Samsung
- => Indicate to SA2 that the number of DRBs in NR will be in the range 16..32 DRBs, and RAN2 has not concluded on the final number.  
=> Ask SA2 whether there are constraints in their specs that may affect the number of DRBs?
- R2-1710654 [Draft] Reply LS on the number of bearers Intel Corporation LS out Rel-15 TEI15
- => Revised in R2-1711986 (Offline discussion #37)
- R2-1711986 [DRAFT] Reply LS on the number of bearers Intel Corporation LS out Rel-15 TEI15  
To:SA2 Cc:RAN, CT, SA, SA1, CT1, CT4
- => Change to 32  
=> Approved in R2-1712066
- Other*
- R2-1710639 [Draft] Reply LS on coexistence between RRC inactive and dual connectivity Intel Corporation LS out Rel-15 NR\_newRAT-Core
- Ericsson ask if " dual connectivity configuration " means that the PDCP termination point and configuration can be kept.
- => Offline discussion to conclude on the wording.  
=> Revised in R2-1711933 (Offline discussion #10, Intel)
- R2-1711933 [DRAFT] Reply LS on coexistence between RRC inactive and dual connectivity Intel Corporation LS out Rel-15 NR\_newRAT-Core To:SA2 Cc:RAN3
- => Approved in R2-1712063

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## 13 Any other business

## 14 Closing of the meeting (17:00)

The meeting was closed at 17:35.

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## Annex A: List of participants

RAN2#99bis participants list is at: <http://webapp.etsi.org/3GPPRegistration/fViewPart.asp?mid=17082>.

Total number of participants: 276 (registered 336)

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## Annex B: List of Tdocs

The list of tdocs of this RAN2#99bis is attached to this report.

Total of 2080 tdoc numbers were allocated of which 1983 tdocs were available.

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## Annex C: Incoming liaison statements

TDoc	Title	Source	Status	Rel	Related WIs	To	Cc	Original LS
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R2-1710002	Reply LS to Supported features by 5GC for E-UTRA connected to 5G CN (C1-173571; contact: Huawei)	CT1	noted	Rel-15	5GS_Ph1-CT, NR_newRAT-Core	SA2, RAN2	SA, SA1, SA5, RAN, RAN3	C1-173571
R2-1710003	Reply LS on request to update maximum data rate values in EPS (C1-173572; contact: Qualcomm)	CT1	noted	Rel-15	5GS_Ph1-CT, NR_newRAT-Core	SA2	RAN3, CT4, CT3, SA5, SA1, RAN2	C1-173572
R2-1710004	Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity (C1-173748; contact: Ericsson)	CT1	noted	Rel-15	EDCE5	SA3, CT4	SA2, RAN2, RAN3	C1-173748
R2-1710005	Reply LS on NR Idle Mode procedures (C1-173749; contact: Qualcomm)	CT1	noted	Rel-15	5GS_Ph1-CT	SA2, RAN2, SA1	RAN3	C1-173749
R2-1710006	Reply LS on LTE call redirection to GERAN (C1-173752; contact: Nokia)	CT1	noted	Rel-15	TEI15	RAN2	SA3, RAN3	C1-173752
R2-1710007	LS on UE capability signalling for sTTI configurations (R1-1714764; contact: Intel)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN4	RAN2	R1-1714764
R2-1710008	LS on Stage 2 description of short TTI and short processing time (R1-1714768; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2		R1-1714768
R2-1710009	LS on TP for key performance indicator, identified problem, evaluation assumptions, channel modelling, and evaluation results (R1-1714860; contact: Ericsson)	RAN1	noted	Rel-15	FS_LTE_Aerial	RAN2		R1-1714860
R2-1710010	Reply LS on BWP operation in NR (R1-1716875; contact: Samsung)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1716875
R2-1710011	LS on NR UL transmission without UL grant (R1-1714995; contact: NTT DOCOMO)	RAN1	noted	Rel-15	NR_newRAT	RAN2		R1-1714995
R2-1710012	LS on Further agreements for Bandwidth part operation (R1-1714996; contact: LGE)	RAN1	noted	Rel-15	NR_newRAT	RAN2	RAN4	R1-1714996
R2-1710013	LS on RAN1 agreements on Enhancements to LTE operation in unlicensed spectrum (R1-1715080; contact: Nokia)	RAN1	noted	Rel-15	LTE_unlic	RAN2		R1-1715080
R2-1710014	LS on RAN1 agreements on mode 3 sidelink CA (R1-1715174; contact: HiSilicon)	RAN1	noted	Rel-15	LTE_eV2X	RAN2		R1-1715174
R2-1710015	LS on initial access with SUL (R1-1715260; contact: Huawei)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1715260
R2-1710016	Reply LS on short processing time and short TTI (R1-1715280; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2		R1-1715280
R2-1710017	LS to RAN2 on supported use case for Rel-15 V2X CA on PC5 (R1-1715282; contact: Huawei)	RAN1	noted	Rel-15	LTE_eV2X-Core	RAN2		R1-1715282
R2-1710018	LS to RAN on PC5 operation with short TTI for V2X phase 2 based on LTE (R1-1715287; contact: Huawei, CATT)	RAN1	noted	Rel-15		RAN	RAN2, RAN4	R1-1715287
R2-1710019	LS on UL HARQ-ACK feedback for Rel-15 LTE eMTC (R1-1715299; contact: ZTE)	RAN1	noted	Rel-15	LTE_eMTC4	RAN2		R1-1715299
R2-1710020	LS on narrowband measurement accuracy enhancement (R1-1715300; contact: Huawei)	RAN1	noted	Rel-15	NB_IOTenh2	RAN4	RAN2	R1-1715300
R2-1710021	LS on TDD NB-IoT (R1-	RAN1	noted	Rel-15	NB_IOTenh2	RAN2		R1-1715301

	1715301; contact: Huawei)							
R2-1710022	LS on TP for remaining evaluation assumptions and channel modelling (R1-1715303; contact: Ericsson)	RAN1	noted	Rel-15	FS_LTE_Aerial	RAN2		R1-1715303
R2-1710023	LS on RAN1 agreements on UE GNSS carrier phase measurement (R1-1715306; contact: Nokia)	RAN1	noted	Rel-15	UTRA_LTE_iPos_enh2	RAN2	RAN4, RAN5	R1-1715306
R2-1710024	LS on power sharing for LTE-NR Dual Connectivity (R1-1715313; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT	RAN4, RAN2		R1-1715313
R2-1710025	Reply LS response on Random Access (R1-1715315; contact: Samsung)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1715315
R2-1710026	LS on NR initial access and mobility (R1-1715316; contact: NTT DOCOMO)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN4	RAN2	R1-1715316
R2-1710027	LS on RRC parameters for FeCoMP (R1-1715332; contact: ZTE)	RAN1	noted	Rel-15	feCOMP_LTE-Core	RAN2		R1-1715332
R2-1710028	Corrections on antenna switching (R1-1715335; contact: Qualcomm)	RAN1	noted	Rel-13	LTE_CA_TDD_FDD-Core	RAN2, RAN4		R1-1715335
R2-1710029	LS on RRC parameters for NR (R1-1715338; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT	RAN2		R1-1715338
R2-1710030	Reply LS on Channel Raster and Synchronization Channel Raster (R1-1716906; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN4	RAN2	R1-1716906
R2-1710031	Reply LS on multiple SSBs within a wideband carrier (R1-1716907; contact: Ericsson)	RAN1	noted	Rel-15		RAN2	RAN4	R1-1716907
R2-1710032	LS on NR Paging Occasion (R1-1716918; contact: Huawei)	RAN1	noted	Rel-15	NR_newRAT	RAN2		R1-1716918
R2-1710033	Reply LS on UE categories and capabilities (R1-1716924; contact: NTT DOCOMO)	RAN1	noted	Rel-15		RAN2	RAN4	R1-1716924
R2-1710034	LS on UE differentiation of NB-IOT (R3-173401; contact: ZTE)	RAN3	noted	Rel-15	NB_IOTenh2-Core	SA2	RAN2	R3-173401
R2-1710035	LS on support of Trace and MDT in NG-RAN in rel-15 (R3-173422; contact: Huawei)	RAN3	noted	Rel-15	NR_newRAT-Core	RAN2, SA5		R3-173422
R2-1710036	LS on definition of RAN Notification Area in inactive state (R3-173427; contact: Nokia)	RAN3	noted	Rel-15	NR_newRAT	RAN2		R3-173427
R2-1710037	Reply LS on shared baseband capabilities for MR-DC (R4-1708284; contact: Huawei)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2	RAN1	R4-1708284
R2-1710038	LS on MBSFN RSRP/RSRQ measurement mapping for FeMBMS (R4-1708663; contact: Qualcomm)	RAN4	noted	Rel-14	MBMS_LTE_enh2-Core	RAN2		R4-1708663
R2-1710039	Reply LS on UE measurement capabilities across LTE and NR (R4-1708694; contact: Huawei)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2	RAN1	R4-1708694
R2-1710040	Reply LS on LTE Rel-14 UE feature list for MUST (R4-1708704; contact: MediaTek)	RAN4	noted	Rel-14	LTE_MUST	RAN2	RAN1	R4-1708704
R2-1710041	Reply LS reply on TM10 / FD-MIMO UE capability signalling (R4-1708730; contact: Intel)	RAN4	noted	Rel-14	LTE_EBF_FDMMO-Core	RAN2	RAN1	R4-1708730
R2-1710042	Reply LS on Support of BCS for Fallback Band Combinations (R4-1708768; contact: Samsung)	RAN4	noted	Rel-13	LTE_CA_enh-Core	RAN2		R4-1708768
R2-1710043	LS on effect of SRS switching in TDD + FDD CA (R4-1708772; contact: Qualcomm)	RAN4	noted	Rel-12		RAN1	RAN2	R4-1708772

R2-1710044	LS on new UE power class for Rel-15 eMTC (R4-1708835; contact: Ericsson)	RAN4	noted	Rel-15	LTE_eMTC4	RAN2	RAN1	R4-1708835
R2-1710045	LS on Mixed numerologies FDM operation (R4-1708864; contact: Intel)	RAN4	noted	Rel-15	NR_newRAT	RAN1, RAN2		R4-1708864
R2-1710046	LS on RSRP Measurements for Mobility in NR (R4-1709017; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	RAN1	RAN2	R4-1709017
R2-1710047	LS on Definitions of Intra-frequency and Inter-frequency Measurements (R4-1709108; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	RAN2	RAN1	R4-1709108
R2-1710048	LS on uplink and downlink channel bandwidth for NR (R4-1709136; contact: Intel)	RAN4	noted	Rel-15	NR_newRAT	RAN1, RAN2		R4-1709136
R2-1710049	LS on Channel Raster and Synchronization Channel Raster (R4-1709175; contact: Qualcomm)	RAN4	noted	Rel-15		RAN1	RAN2	R4-1709175
R2-1710050	LS on RAN4 Rel-14 UE Feature List (R4-1709180; contact: Intel)	RAN4	noted	Rel-14	TEI14	RAN2	RAN1, RAN3	R4-1709180
R2-1710051	LS on scenarios of multiple SSB (R4-1709890; contact: Huawei)	RAN4	noted	Rel-15	NR_newRAT	RAN2	RAN1	R4-1709890
R2-1710052	UE timing advance adjustment step size (R4-1709899; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	RAN1	RAN2	R4-1709899
R2-1710053	LS on RSSI Definition in Signal Quality Measurements for Mobility in NR (R4-1709910; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	RAN1	RAN2	R4-1709910
R2-1710054	LS on NR band numbering (R4-1710045; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2, RAN3		R4-1710045
R2-1710055	Reply LS to RAN2 for NR UE categories and UE capabilities (R4-1710079; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	RAN2	RAN, RAN1	R4-1710079
R2-1710056	LS Seeking clarification on DCI monitoring subframe for eIMTA (R5-175165; contact: Huawei)	RAN5	noted			RAN2, RAN4		R5-175165
R2-1710057	LS on Restricted Use of Enhanced Coverage (R6-170460; contact: Nokia)	RAN6	noted	Rel-14	CloT_Ext	CT1	SA2, RAN2	R6-170460
R2-1710058	LS on IMT-2020 submission (RP-172099; contact: NEC)	RAN	noted	Rel-15		SA, RAN1, RAN2, RAN3, RAN4, RAN5	CT, RAN6	RP-172099
R2-1710059	LS on single Tx switched UL (RP-172100; contact: Qualcomm, Intel)	RAN	noted	Rel-15	NR_newRAT	RAN4, RAN2	RAN1, RAN3	RP-172100
R2-1710060	LS on NR UE Category (RP-172113; contact: MediaTek)	RAN	noted	Rel-15	NR_newRAT	RAN1	RAN2, RAN4	RP-172113
R2-1710061	Reply LS on support of CACC and platooning applications by 3GPP systems (S1-173531; contact: LGE)	SA1	noted	Rel-15	eV2X	SAE DSRC Technical Committee	SA2, RAN2, RAN1, SAE Cellular V2X Technical Committee	S1-173531
R2-1710062	Reply LS on unified Access Control for 5G NR (S1-173552; contact: Nokia)	SA1	noted	Rel-15	SMARTER, NR_newRAT	CT1, SA2, RAN2	CT6	S1-173552
R2-1710063	Reply LS on mapping between service types and V2X frequencies (S2-174064;	SA2	noted	Rel-14	V2XARC	RAN2, CT1		S2-174064

	contact: Huawei)							
R2-1710064	Reply LS on Solution 9 (Option 2) for CN overload control for CP data (S2-176130; contact: Qualcomm)	SA2	noted	Rel-14	CloT_Ext	CT1, RAN3, RAN2		S2-176130
R2-1710065	LS on coexistence between RRC inactive and dual connectivity (S2-176158; contact: Qualcomm)	SA2	noted	Rel-15	5GS_Ph1	RAN2, RAN3		S2-176158
R2-1710066	LS on FS_REAR study outcome (S2-176446; contact: Huawei)	SA2	noted	Rel-15	FS_feD2D_IoT_relay_wearable, FS_REAR	RAN, RAN1, RAN2, RAN3	SA3, CT1	S2-176446
R2-1710067	LS on Paging failures for CE Capable UEs (S2-176685; contact: NTT DOCOMO)	SA2	noted	Rel-13	TEI13	RAN2, RAN3		S2-176685
R2-1710242	LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR (S2-176689; contact: Intel)	SA2	noted	Rel-15		RAN1, RAN2, RAN4		S2-176689
R2-1710243	LS on no dedicated bearer support over NB-IoT (S2-176690; contact: MediaTek)	SA2	withdrawn	Rel-13	CloT	RAN5, RAN2, CT1		S2-176690
R2-1710244	LS on UE/RAN Radio information and Compatibility Request Response (S2-176691; contact: Qualcomm)	SA2	noted	Rel-15	5GS_Ph1	RAN2, RAN3		S2-176691
R2-1710245	LS on the number of bearers (S2-176693; contact: Telstra)	SA2	noted	Rel-15	TEI15	RAN2, CT1, CT4	RAN, CT, SA, SA1	S2-176693
R2-1711007	Response LS on default DRB establishment for PDU session (S2-176475; contact: InterDigital)	SA2	noted	Rel-15	5GS_Ph1	RAN2	RAN3	S2-176475
R2-1711829	LS on RRC parameters for WI on shortened TTI and processing time for LTE (R1-1714986; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT-Core	RAN2		R1-1714986
R2-1711842	LS on RRC parameters for NR (R1-1716933; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1716933
R2-1711843	LS on no dedicated bearer support over NB-IoT (S2-176690; contact: MediaTek)	SA2	noted	Rel-13	CloT	RAN5, RAN2, CT1		S2-176690
R2-1711964	Reply LS on mixed numerologies FDM operation (R1-1718829; contact: Intel)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN4	RAN2	R1-1718829
R2-1711965	LS on 2Gbps category (R1-1719084; contact: Qualcomm)	RAN1	available	Rel-14	TEI14	RAN2, RAN		R1-1719084
R2-1711987	NR UE information elements (R4-1711581; contact: Nokia)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2		R4-1711581
R2-1712017	Reply LS on NR handover related parameters (R4-1710373; contact: Intel)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2	RAN1	R4-1710373

78 incoming LS, of which 76 were noted. One LS was withdrawn (submitted with wrong attachments) and one was not discussed and will be moved to RAN2#100 for treatment.

## Annex D: Outgoing liaison statements

TDoc	Title	Release	Related WIs	To	Cc
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R2-1711861	Reply LS on FS_REAR study outcome	Rel-15	FS_feD2D_IoT_relay_wearable	SA2	RAN, RAN1, RAN3, SA3, CT1
R2-1711867	LS to RAN1 on SCell activation and deactivation	Rel-15	NR_newRAT-Core	RAN1	
R2-1711871	LS to RAN1 on SPS and Grant-free	Rel-15	NR_newRAT-Core	RAN1	
R2-1711895	LS on UE differentiation for Rel-15 NB-IoT	Rel-15	NB_IoTenh2-Core	SA2	RAN3, CT1
R2-1711897	LS on Relaxed Monitoring for cell reselection	Rel-15	NB_IoTenh2-Core, LTE_eMTC4-Core	RAN4	
R2-1711977	LS on Early Data Transmission	Rel-15	LTE_eMTC4-Core, NB_IoTenh2-Core	RAN1	
R2-1711978	LS on Early Data Transmission	Rel-15	LTE_eMTC4-Core, NB_IoTenh2-Core	RAN3, SA2, SA3, CT1	
R2-1712006	Reply LS on definition of RAN Notification Area in inactive state	Rel-15	NR_newRAT-Core	RAN3	
R2-1712023	Response LS on NR Paging Occasion	Rel-15	NR_newRAT-Core	RAN1	
R2-1712025	LS on inter-MN handover with SN change	Rel-15	NR_newRAT-Core	RAN3	
R2-1712026	LS on formula or table for L1 data rate	Rel-15	NR_newRAT-Core	RAN1	
R2-1712027	Reply LS on mixed numerologies FDM operation	Rel-15	NR_newRAT-Core	RAN4	RAN1
R2-1712028	LS on UE RF related parameters, capabilities and features for NR	Rel-15	NR_newRAT-Core	RAN4, RAN1	RAN3
R2-1712029	LS on SSTD measurements for EN-DC	Rel-15	NR_newRAT-Core	RAN4	RAN1
R2-1712030	LS on provisioning of positioning assistance data via LPPa for broadcast	Rel-15	LCS_LTE_acc_enh-Core	RAN3	
R2-1712031	LS on encoding and encryption of positioning assistance data	Rel-15	LCS_LTE_acc_enh-Core	SA3	
R2-1712032	LS to RAN1 on the agreements on carrier and resource selection in CA	Rel-15	LTE_eV2X-Core	RAN1	
R2-1712035	LS on RAN2 progress of QoE Measurement Collection in LTE	Rel-15	LTE_QMC_Streaming-Core	RAN3, CT1, SA4, SA5	
R2-1712036	Reply LS on Seeking clarification on DCI monitoring subframe for eIMTA			RAN5	RAN4
R2-1712041	Reply LS to RAN3 on MDT	Rel-15	NR_newRAT-Core	RAN3	SA5
R2-1712042	LS on Switching on split bearer at blocking of NR radio	Rel-15	NR_newRAT-Core	RAN3	
R2-1712046	LS to RAN1 on RAN2 agreements related to BWP	Rel-15	NR_newRAT-Core	RAN1	
R2-1712049	Reply LS on UE/RAN Radio information and Compatibility Request Response	Rel-15	NR_newRAT-Core	SA2	RAN3
R2-1712050	LS on supported bearer types in DC	Rel-15	NR_newRAT-Core	RAN3	
R2-1712051	LS on usage of user plane integrity protection for DRB	Rel-15	NR_newRAT-Core	SA2, SA3	
R2-1712052	LS on security during Resume reject in INACTIVE state in NR	Rel-15	NR_newRAT-Core	SA3	
R2-1712056	LS on NR PBCH content	Rel-15	NR_newRAT-Core	RAN1	
R2-1712058	LS on CR for Reference Signals for MBSFN with 1.25kHz and 7.5kHz sub-carrier spacing	Rel-14	MBMS_LTE_enh2-Core	RAN1	
R2-1712059	LS on RAN2 agreements for Rel-15 LAA	Rel-15	LTE_unlic-Core	RAN1	
R2-1712060	LS to RAN4 on RAN2 agreements for enhanced CA utilization WID	Rel-15	LTE_euCA-Core	RAN4	
R2-1712061	LS on RA preamble power ramping	Rel-15	NR_newRAT-Core	RAN1	
R2-1712063	Reply LS on coexistence between RRC inactive and dual connectivity	Rel-15	NR_newRAT-Core	SA2	RAN3
R2-1712065	LS to RAN2 agreements related to PHR	Rel-15	NR_newRAT-Core	RAN1, RAN4	
R2-1712066	Reply LS on the number of bearers	Rel-15	TEI15	SA2, CT1	RAN, CT, SA, SA1, CT4
R2-1712067	Reply LS on Paging failure for CE capable Ues	Rel-13	TEI13	RAN3, SA2	
R2-1712068	LS on details of network identifiers	Rel-15	LTE_5GCN_connect, NR_newRAT-Core	CT4, SA2	
R2-1712077	LS on EDT procedures and AS NAS interaction	Rel-15	LTE_eMTC4	RAN3, CT1, SA2	
R2-1712078	LS on UE baseband processing capability	Rel-15	NR_newRAT	RAN1, RAN4	
R2-1712079	LS on reduced SCell activation time for enhanced CA utilization WID	Rel-15	LTE_euCA	RAN4	

39 outgoing LS.

## Annex E: List of in-principle agreed CRs

Agreed CRs:

TDoc	Title	Source	Rel	Spec	Related WIs	CR	Rev	Cat
R2-1710246	Introduction of DL 2Gbps Category	Qualcomm Incorporated	Rel-14	36.331	TEI14	3071	1	B
R2-1710247	Introduction of DL 2Gbps Category	Qualcomm Incorporated	Rel-14	36.306	TEI14	1508	1	B
R2-1710748	Removal of FFS for RAI in 36.321	Ericsson	Rel-14	36.321	NB_IOTenh-Core	1186		F
R2-1710891	Correction on SRS switching capabilities field description	Qualcomm Incorporated	Rel-14	36.331	LTE_SRS_switch	3088		F
R2-1711225	Minor correction on the IE of pusch-EnhancementsConfig in feMTC	Huawei, HiSilicon	Rel-14	36.321	LTE_MTCe2_L1-Core	1187		F
R2-1711227	Correction on TS 36.300 for feMTC	Huawei, HiSilicon	Rel-14	36.300	LTE_MTCe2_L1-Core	1066		F
R2-1711362	Correction of reference for KPHICH value	Ericsson India Private Limited	Rel-14	36.321	LTE_feMTC-Core	1189		F
R2-1711444	Define requirement for reception of number of simultaneous SC-PTM services	Qualcomm Incorporated	Rel-13	36.331	LTE_SC_PTM-Core	3106		F
R2-1711453	Define requirement for reception of number of simultaneous SC-PTM services	Qualcomm Incorporated	Rel-14	36.331	LTE_SC_PTM-Core	3108		A
R2-1711512	UE capability, retrieval of fallback combinations	Samsung Telecommunications	Rel-14	36.331	LTE_CA_enh_b5C-Core, TEI14	3117		F
R2-1711559	Deliver stored PDCP SDUs for LWA bearer with RLC UM at PDCP re-establishment	LG Electronics France	Rel-14	36.323	LTE_WLAN_aggr-Core	0203		F
R2-1711611	MBSFN RSRP/RSRQ measurement mapping for FeMBMS	Qualcomm Incorporated	Rel-14	36.331	MBMS_LTE_enh2-Core	3118		F
R2-1711617	Reference Signals for MBSFN with 1.25kHz and 7.5kHz sub-carrier spacing	Qualcomm Incorporated	Rel-14	36.300	MBMS_LTE_enh2-Core	1069		F
R2-1711644	Alignment of FGI4 (Short DRX) for Cat M1	Ericsson	Rel-13	36.331	LTE_MTCe2_L1-Core	3119		F
R2-1711645	Alignment of FGI4 (Short DRX) for Cat M1 and M2	Ericsson	Rel-14	36.331	LTE_MTCe2_L1-Core	3120		F
R2-1711848	Correction on SubframeBitmap Configuration in Band 47	Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	3085	1	F
R2-1711854	Correction to UE capabilities	Nokia, Nokia Shanghai Bell	Rel-14	36.331	LTE_V2X-Core	3107	1	F
R2-1711859	Corrections to V2X in TS 36.300	Huawei, HiSilicon	Rel-14	36.300	LTE_V2X-Core	1062	2	F
R2-1711860	CR on SIB21 reading	OPPO, Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	3073	2	F
R2-1711862	Introduction of PDCP in layer 2 relaying protocol stacks	Huawei, HiSilicon	Rel-15	36.746	FS_feD2DIoT_relay_wearable	0002	2	F
R2-1711878	Introduction of the UE capability for overheating indication	Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell	Rel-14	36.306	TEI14	1490	4	B
R2-1711879	Clarification on Interference Randomisation in NB-IoT in 36.331	Ericsson, Qualcomm Incorporated	Rel-14	36.331	NB_IOTenh-Core	3090	1	F
R2-1711881	Corrections on paging monitoring in RRC_CONNECTED in Rel-13 eMTC	Huawei, HiSilicon	Rel-13	36.331	LTE_feMTC-Core	3045	2	F
R2-1711882	Corrections on paging monitoring in RRC_CONNECTED in Rel-13 eMTC	Huawei, HiSilicon	Rel-13	36.300	LTE_feMTC-Core	1054	2	F
R2-1711884	Correction on downlink reception type combination for SC-PTM in feMTC	Huawei, HiSilicon	Rel-14	36.302	LTE_feMTC-Core	0115	1	F
R2-1711887	Corrections on TS 36.302 for Rel-13 eMTC	Huawei, HiSilicon	Rel-13	36.302	LTE_feMTC-Core	0116	1	F
R2-1711889	Target cell optional PBCH repetition status indication	Qualcomm Incorporated	Rel-14	36.331	LTE_feMTC-Core	3037	2	F
R2-1711930	Restructuring of CQI-ReportConfig (email discussion 99#21)	Nokia, Nokia Shanghai Bell	Rel-14	36.331	TEI14	2968	3	F
R2-1711990	DCI monitoring subframes for eIMTA	Huawei, HiSilicon	Rel-12	36.331	LTE_TDD_eIMTA-Core	3123		F
R2-1711991	DCI monitoring subframes for eIMTA	Huawei, HiSilicon	Rel-13	36.331	LTE_TDD_eIMTA-Core	3124		A
R2-1711992	DCI monitoring subframes for eIMTA	Huawei, HiSilicon	Rel-14	36.331	LTE_TDD_eIMTA-Core	3125		A
R2-1712002	SFN desynchronization between eNB and eDRX UE	NTT DOCOMO, INC.	Rel-14	36.331	LTE_extDRX-Core	3126		F
R2-1712039	Introduction of the overheating indication	Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell	Rel-14	36.300	TEI14	1048	5	B
R2-1712053	Introduction of the overheating indication	Huawei Device, Huawei, HiSilicon, ICom	Rel-14	36.331	TEI14	2982	6	B

R2-1712073	Introduction of QoE Measurement Collection for LTE	Huawei	Rel-15	36.331	LTE_QMC_Streaming-Core	3087	1	B
R2-1712074	Introduction of QoE Measurement Collection for LTE	Huawei	Rel-15	36.300	LTE_QMC_Streaming-Core	1063	1	B
R2-1712075	Introduction of QoE Measurement Collection for LTE	Huawei	Rel-15	36.306	LTE_QMC_Streaming-Core	1512	1	B

37 in-principle agreed CRs.

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## Annex F: Email Approvals

### Deadline Thursday, 2017-10-19, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[99bis#01][LTE/5GC] LS to SA2/CT4 (Ericsson)

- Intended outcome: Approved LS
- Deadline: Thursday 2017-10-19
- => The LS is approved in R2-1712068

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### Deadline Thursday, 2017-10-26, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[99bis#02][LTE/5GC] CR to 36.300 (Huawei)

- Capture agreements from this meeting
- Intended outcome: Endorsed running CR
- Deadline: Thursday 2017-10-26
- => Endorsed as a running CR in R2-1712069

[99bis#03][NR] TS 38.300 (Nokia)

- Capture agreements from this meeting
- Intended outcome: Endorsed TS
- Deadline: Thursday 2017-10-26
- => Endorsed as v1.1.1 in R2-1711972

[99bis#04][NR] TS 37.340 (ZTE)

- Capture agreements from this meeting
- Intended outcome: Endorsed TS
- Deadline: Thursday 2017-10-26
- => Endorsed as v1.1.1 in R2-1712072

[99bis#05][NR] UE capabilities LS (DOCOMO)

- Intended outcome: Approved LS
- Deadline: Thursday 2017-10-26
- => The LS is approved in R2-1712078

[99bis#06][LTE/UDC] Running 36.323 CR for introducing UDC (CATT)

- Capture related agreements from this meeting
- Intended outcome: Endorsed running CR
- Deadline: Thursday 2017-10-26
- => Endorsed as a running CR in R2-1712070

[99bis#07][LTE/UDC] Running 36.331 CR for introducing UDC (CATT)

- Capture related agreements from this meeting

- Intended outcome: Endorsed running CR
  - Deadline: Thursday 2017-10-26
- => Endorsed as a running CR in R2-1712071

[99bis#09][LTE/QMC] CR of Introduction of QMC in 36.331 (Huawei)

- Intended outcome: Agreed CR in principle
  - Deadline: Thursday 2017-10-26
- => Agreed in principle in R2-1712073

[99bis#10][LTE/QMC] CR of Introduction of QMC in 36.300 (Huawei)

- Intended outcome: Agreed CR in principle
  - Deadline: Thursday 2017-10-26
- => The CR is agreed in principle in R2-1712074.

[99bis#11][LTE/QMC] CR of Introduction of QMC in 36.306 (Huawei)

- Intended outcome: Agreed CR in principle
  - Deadline: Thursday 2017-10-26
- => The CR is agreed in principle in R2-1712075.

[99bis#54][MTC/NB-IoT] EDT AS/NAS interaction – MediaTek

- Email discussion on the AS/NAS interaction and the possible impact on RAN3 related aspects with the intention to send an LS to RAN3 from this meeting if issues are identified [MediaTek]
  - Intended outcome: Approved LS
  - Deadline: Thursday 2017-10-26
- => The document describing the EDT procedure in R2-1712076 is endorsed.  
=> The LS is approved in R2-1712077.

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## Deadline Thursday, 2017-11-02, 23:59 Pacific Time

**TDoc numbers for the following email discussions may be requested via 3GU tool**

[99bis#12][NR UP/MAC] – Running TS 38.321 – Samsung

- Agreeable TS to be endorsed next meeting
- Deadline 3 weeks after the meeting

[99bis#13][NR UP/RLC] – Running TS 38.322 – Mediatek

- Agreeable TS to be endorsed next meeting
- Deadline 3 weeks after the meeting

[99bis#14][NR UP/PDCP] – Running TS 38.323 – LG

- Agreeable TS to be endorsed next meeting
- Deadline 3 weeks after the meeting

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## Deadline Thursday, 2017-11-09, 23:59 Pacific Time

**TDoc numbers for the following email discussions may be requested via 3GU tool**

[99bis#15][NR] Capability of signalling for 1 tx (Nokia)

- Discuss options for capability signalling for 1 tx. Can consider the agreements made in RAN4 during this week. Aim to produce stage 3 text for the option(s) for which there is support so conclusion can be made at the next meeting.
- Intended outcome: Report and text proposal(s) to next meeting

- Deadline: Thursday 2017-11-09

[99bis#16][NR] TS 38.331 (Ericsson)

- Phase 1 to merge TPs from this meeting (1 week)
- Phase 2 to continue to progress draft TS. (by Thursday 2017-11-09), addressing any aspects not specifically in the scope of another email (e.g. RRM, L2, L1 parameters). To include:
  - updating to capture agreements from this meeting
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Phase 3 to merge outcome of other email discussion into updated draft TS (as soon as possible after Thursday 2017-11-09)
- Intended outcome: TP (changes to draft TS) for next meeting
- Deadline: As soon as possible after Thursday 2017-11-09

[99bis#17][NR] Reconfiguration and bearer handling (Ericsson)

- After merge of TPs from this meeting in draft TS, continue to progress the reconfiguration and bearer handling ASN.1 and corresponding field descriptions and procedure text. To include:
  - updating to capture agreements from this meeting
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting
- Deadline: Thursday 2017-11-09

[99bis#18][NR] L2 parameters in RRC (Huawei)

- After merge of TPs from this meeting in draft TS, continue to progress the L2 parameters ASN.1 and corresponding field descriptions and procedure text. To include:
  - updating to capture agreements from this meeting
  - discuss required parameters and value ranges (starting point those in TP)
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting
- Deadline: Thursday 2017-11-09

[99bis#19][NR] L1 parameters in RRC (Ericsson)

- After merge of TPs from this meeting in draft TS, continue to progress the L1 parameters ASN.1 and corresponding field descriptions and procedure text. To include:
  - updating to capture agreements from this meeting
  - updating to capture latest information from RAN1
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting
- Deadline: Thursday 2017-11-09

[99bis#20][NR] RRM (Ericsson)

- After merge of TPs from this meeting in draft TS, continue to progress RRM, ASN.1 and corresponding field descriptions and procedure text. To include:
  - updating to capture agreements from this meeting
  - attempt to address identified FFS points
  - identify FFS points that need online discussion at next meeting
- Intended outcome: TP (changes to draft TS) for next meeting
- Deadline: Thursday 2017-11-09

[99bis#21][NR] RRC reconfiguration processing time for EN-DC (Ericsson)

- To discuss the processing times for EN-DC and for some applicable cases in NR. Includes processing times for messages via SRB1 with embedded NR message and messages via SRB3. Processing times are for EN-DC capable UEs and not for LTE only UEs.
- Intended outcome: Report to next meeting

- Deadline: Thursday 2017-11-09

[99bis#22][NR] Filter coefficients (MediaTek)

- Discuss the configuration flexibility available to the network in configuring different filter coefficients and reporting quantities for beam measurements. Needs to discuss the scale of the problem, where the complexity lies, and potential solutions. Can consider the proposal for 2 coefficients in the quantity config.
- Outcome of the discussion could be a draft LS to RAN4 for approval on the first day of the next meeting.
- Intended outcome: Report and possible LS to the next meeting.
- Deadline: Thursday 2017-11-09

[99bis#23][NR] TP on beam selection (Ericsson)

- Rapporteur can set an earlier deadline to make the MAC TP available earlier for inclusion in MAC TS. (Parameters will be covered by the RRC emails discussions)
- Intended outcome: Agreed TP for inclusion in MAC TS
- Deadline: Thursday 2017-11-09

[99bis#24][NR] AC (Intel)

- Gather questions on the SA1 requirements and clarifications that may be needed.
- Intended outcome: LS to SA1 for approval at beginning of next RAN2 meeting.
- Deadline: Thursday 2017-11-09

[99bis#25][NR] Inter-node RRC messages (Samsung)

- Progress details of internode RRC messages based on agreements from this meeting. First version can already take into account contributions submitted to this meeting.
- Intended outcome: TP for the RRC inter node messages
- Deadline: Thursday 2017-11-09

[99bis#26][NR] LTE RRC running CRs (Samsung)

- Intended outcome: 2 running CRs for LTE RRC
- Deadline: Thursday 2017-11-09

[99bis#27][NR] L2/3 capabilities (Intel)

- Progress the L2/3 capability table from email discussion#25. Aim to progress which features are baseline, which need IOT or capability bits, etc
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#28][NR] UE capability ASN.1 structure (Intel)

- Progress the ASN.1 structure for UE capabilities in NR and LTE RRC spec and the corresponding field descriptions.
- Intended outcome: TP to next meeting
- Deadline: Thursday 2017-11-09

[99bis#29][LTE/UDC] Operator controlled dictionary issue [MTK]

- Clarify the behaviour and procedure
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#30][LTE/UAV] Capture potential solutions for DL and UL Interference detection [DCM]

- Capture the agreed potential solutions into TR
- Capture the agreed observations into TR
- Intended outcome: Agreeable TP
- Deadline: Thursday 2017-11-09

[99bis#31][LTE/UAV] Capture handover simulation results with observations [Huawei]

- Intended outcome: agreeable TP
- Deadline: Thursday 2017-11-09

[99bis#32][LTE/euCA] Faster activation for Scells (Nokia)

Discussion the pros and cons of the following solutions:

- 1) New state (R2-1710138)
- 2) Direct activation at configuration
- 3) Enhance the existing activation (R2-1711641)

Other solutions can be included.

Identify the questions for asking RAN4 to progress the new state proposal. Attach the contribution R2-1710138

- Intended outcome: Approved LS to RAN4 by 2017-10-26
- => The LS is approved in R2-1712079.
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#33][NB-IoT R14] UE-Capability-NB extension (Sequans)

- Intended outcome: Agreeable CR
- Deadline: Thursday 2017-11-09

[99bis#34][NB-IoT] Timer impact of TDD (Ericsson)

- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#35][NB-IoT/MTC] Relaxed Monitoring (Ericsson)

- On FFSes and Stage-3 details
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#36][NB-IoT] RRC release enhancements (Qualcomm)

- On FFSes and Stage-3 details
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#37][NB-IoT/MTC] WakeUp Signal (Huawei)

- If we get an LS, try to respond to R1 questions, identify R2 solutions can consider also stage-3, assume this is only for Idle mode
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#38][NR UP/MAC] – SR open issues - Nokia

- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

[99bis#39][NR UP/MAC] – BSR open issues - Vivo

- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

[99bis#40][NR UP/ MAC] – LCP – Interdigital



- Downscope between options
- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

[99bis#41][NR UP/MAC] – Open issues on SPS and GF – Huawei

- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline: Thursday 2017-11-09

[99bis#42][NR UP/MAC] – NR Unit replacement – Ericsson

- Identify proper time units to replace NR units throughout the specs
- Outcome – TP
- Deadline: Thursday 2017-11-09

[99bis#43][NR UP/MAC] Impact of BWP – LG

- Identify impact of BWP on different MAC functions
- Outcome: set of proposals and potential TP
- Deadline Thursday 2017-11-09

[99bis#59][NR UP/RLC] Open issues related to RLC – Ericsson

- Identify critical remaining open issues to be addressed for the December freeze (1 week for this)
- Outcome: Set of proposals to address the issues and a potential TP
- Deadline Thursday 2017-11-09

[99bis#44][NR UP/PDCP] – TP for PDCP pre-processing – LG

- Capture agreements on PDCP pre-processing for UL data
- Outcome: Agreeable TP for next meeting
- Deadline: Thursday 2017-11-09

[99bis#45][LTE/IDC] – UL CA IDC problems- Nokia

- Identify problematic scenarios
- Identify expected UE behaviour
- Conclude if a CR is needed
- Deadline: Thursday 2017-11-09

[99bis#46][LTE/V2X] CR to 36.321 - LG

- Intended outcome: Agreeable CR to next meeting
- Deadline: Thursday 2017-11-09

[99bis#47][LTE/sTTI] CR to 36.300 – Ericsson

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

[99bis#48][LTE/sTTI] CR to 36.321 – Ericsson

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

[99bis#49][LTE/sTTI] CR to 36.331 – Ericsson

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

[99bis#50][LTE/sTTI] CR to 36.302 – Ericsson

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

[99bis#51][LTE/sTTI] CR to 36.306 – Ericsson

- Intended outcome: Running CR
- Deadline: Thursday 2017-11-09

[99bis#52][LTE/sTTI] – Remaining open issues on sTTI – Ericsson

- Identify the L2 timers open issues
- Identify HARQ open issues
- Deadline: Thursday 2017-11-09

[99bis#53][MTC/NB-IoT] EDT indication via PRACH – Ericsson

- Email discussion on the details for EDT indication via PRACH pool partitioning, e.g., preamble/time/frequency/carrier domain.
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#55][MTC/NB-IoT] EDT RRC messages – Huawei

- Email discussion on whether new RRC messages are introduced or existing RRC messages are extended to provide the required signalling for EDT. [Huawei]
- Intended outcome: Report to next meeting
- Deadline: Thursday 2017-11-09

[99bis#60][LTE/UAV] Capture field trial results [Qualcomm]

- Capture the results at least from DCM, Qualcomm and KDDI.
- Additional results from other companies
- Intended outcome: agreeable TP
- Deadline: Thursday 2017-11-09

[99bis#61][LTE/UAV] Identify potential solutions on mobility enhancement (Ericsson)

- Based on the papers in 9.4.4
- The solutions for interference detection can also be considered
- Intended outcome: discussion report
- Deadline: Thursday 2017-11-09

[99bis#08][LTE/UAV] Running TR36.777 (DCM)

- Capture agreements from this meeting
- Capture the agreed TPs from email discussions #30, 31, 60, 61
- Intended outcome: Agreeable running TR for submission to the next meeting
- Deadline: Thursday 2017-11-09

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## Deadline Thursday, 2018-02-08, 23:59 Pacific Time

**TDoc numbers for the following email discussions may be requested via 3GU tool**

[99bis#56][LTE/Positioning] Running LPP CR (Qualcomm)

- Running LPP CR for positioning accuracy enhancements
- To update the running CR with outcomes of this meeting and the related offline discussions.
- Deadline: for February meeting

[99bis#57][LTE/Positioning] Future phase support of SSR (u-blox)

- To converge on what SSR aspects can be supported in future phases, including what if any integrity information would be needed.
- Output: report to February meeting
- Deadline: for February meeting

[99bis#58][LTE/Positioning] Measurements for IMU positioning (Intel)

- To identify the needed measurements to support IMU positioning, with goal of producing a consensus TP if possible.
- Deadline: for February meeting

## Annex G: History

Document history		
Date	TSG RAN WG2 Tdoc	Subject
23.10.2017	-	Draft report v1
08.11.2017		Draft report v2 (includes the results of email discussions #02-#07, #09-#11,#54 and #32 (partly).
26.11.2017		Draft report v3 (changing the source company for R2-1711875)
27.11.2017	R2-1712101	Version submitted for approval in RAN2#100
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# **APPENDIX C**

Source: CATT  
Title: RRC connection re-establishment and resume procedures in NR  
Agenda Item: 10.4.1.3.5  
Document for: Discussion and Decision

## 1. Introduction

In RAN2#97bis meeting, some guidelines are agreed for the RRC messages and procedures [1].

### Agreement

1 Aim to limit the number of RRC messages i.e. avoid introducing several messages with similar content/similar procedural handling (details can be discusses when more progress has been made on the individual procedures)

This contribution discusses the details of individual procedures for RRC connection re-establishment and resume.

## 2. Discussion

### 2.1. RRC connection re-establishment

In LTE, The purpose of this procedure is to re-establish the RRC connection, which involves the resumption of SRB1 operation, the re-activation of security and the configuration of only the PCell.

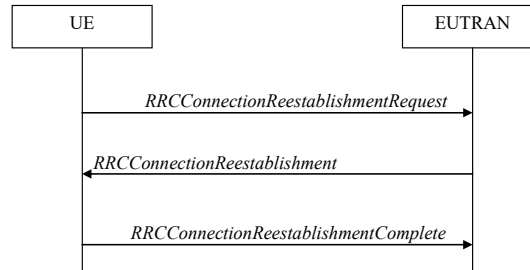


Figure 1 RRC connection re-establishment, successful

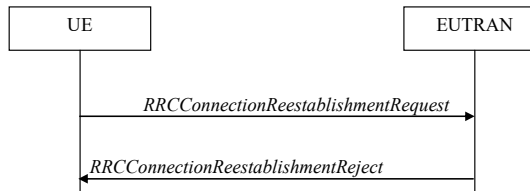


Figure 2 RRC connection re-establishment, failure

The function of re-establishing the RRC connection should naturally be supported in NR for UE in connected mode, including the successful and failure procedures.

**Proposal 1: Support the successful and failure procedures for RRC connection re-establishment in NR.**

The content of the RRC messages for RRC connection re-establishment are listed in the table 1.

Table 1 content of the RRC messages for RRC connection re-establishment

RRC message	Content in LTE	Proposed Content in NR
<i>RRCCONNECTIONREESTABLISHMENTREQUEST</i>	● ue-Identity	● ue-Identity

	<ul style="list-style-type: none"> <li>● reestablishmentCause</li> </ul>	<ul style="list-style-type: none"> <li>● reestablishmentCause</li> </ul>
<i>RRCConnectionReestablishment</i>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● radioResourceConfigDedicated (for SRB1)</li> <li>● NextHopChainingCount</li> </ul>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● radioResourceConfigDedicated (for SRB1)</li> <li>● NextHopChainingCount</li> </ul>
<i>RRCConnectionReestablishment Complete</i>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● rlf-InfoAvailable-r9</li> <li>● logMeasAvailable-r10</li> <li>● connEstFailInfoAvailable-r11</li> <li>● logMeasAvailableMBSFN-r12</li> </ul>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> </ul>
<i>RRCConnectionReestablishment Reject</i>	<ul style="list-style-type: none"> <li>● No IE</li> </ul>	<ul style="list-style-type: none"> <li>● No IE</li> </ul>

For *RRCConnectionReestablishmentRequest*, *RRCConnectionReestablishment* and *RRCConnectionReestablishmentReject* messages, all parameters for LTE are also needed in NR.

For *RRCConnectionReestablishmentComplete* message, the IEs *rlf-InfoAvailable-r9*, *logMeasAvailable-r10*, *connEstFailInfoAvailable-r11* and *logMeasAvailableMBSFN-r12* are related to MDT/SON which are not supported in NR phase I, so only IE *rrc-TransactionIdentifier* is needed in NR.

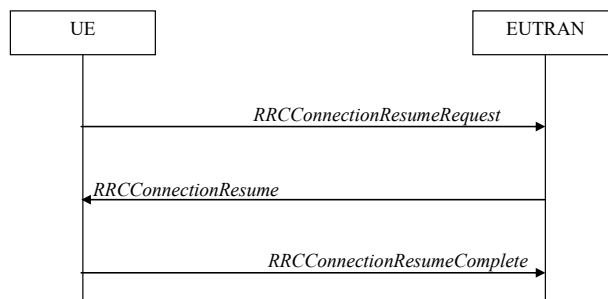
The RRC connection re-establishment procedure is used for SRB1 resumption and re-activation of security and the configuration of only the PCell, so the following parameters are proposed to support.

**Proposal 2: Support the following parameters for the RRC messages in RRC connection re-establishment procedure, the details of each parameter can be discussed further:**

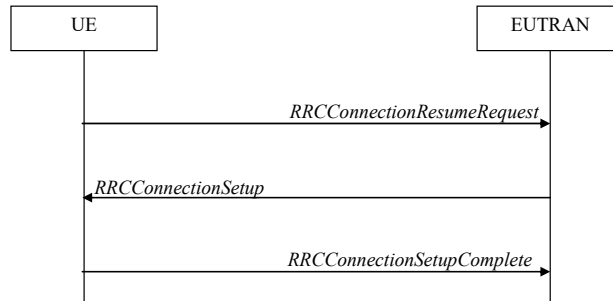
- ***RRCConnectionReestablishmentRequest*: UE ID, Re-establishment Cause**
- ***RRCConnectionReestablishment*: Transaction ID, dedicated radio resource configuration for SRB1, NCC**
- ***RRCConnectionReestablishmentComplete*: Transaction ID**

## 2.2. RRC connection resume

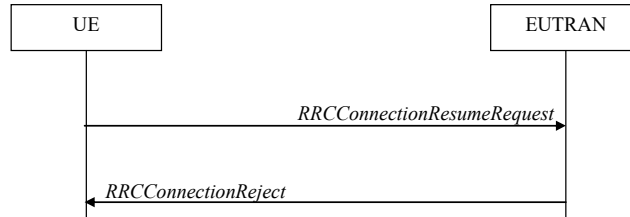
In LTE, the purpose of this procedure is to resume an RRC connection, which involves the resumption of all SRBs and DRBs, and the re-activation of security.



**Figure 3 RRC connection resume, successful**



**Figure 4 RRC connection resume fallback to RRC connection establishment, successful**



**Figure 5 RRC connection resume, network reject or release**

In RAN2#99, it is agreed that for INACTIVE to CONNECTED RRC transition, RRC connection resume request kind of message is sent over SRB0 carried by RACH MSG3. When RAN successfully retrieves and verifies the UE context, RRC connection resume kind of message is sent over SRB1 carried by RACH MSG4, and MSG5 is RRC connection resume complete kind of message over SRB1 [2]. Accordingly, the successful resume is supported for the UE in inactive mode in NR. Moreover, RAN2 agreed that when RAN cannot successfully retrieve and verify the UE context, RRC Connection Setup kind of message is sent over SRB0 (which would enable a fallback to establish a new RRC connection similar to Rel-13 LTE), i.e., fallback to RRC connection establishment is supported for the UE resuming from inactive mode in NR. In addition, in RAN2#98 it is agreed that “If the UE received a message suspending the UE on MSG4 on SRB1 then the UE remains in RRC inactive” [3], it can be realized by network reject or release procedure, which is under discussion of email discussion#29. Consequently, we expect that network reject or release procedures should be supported for the UE resuming from inactive mode in NR.

**Proposal 3: Support the successful resume, fallback to RRC connection establishment and either network reject or release procedures for RRC connection resume in NR.**

In RAN2#99, RAN2 also achieved some agreements on the information included in the above messages directly and indirectly. Specifically, for INACTIVE to CONNECTED RRC transition, RRC Connection Resume Request kind of message includes UE identity (or UE context identity), establishment (or resume) cause information and UE's security information (e.g. authentication token). FFS if MSG3 could also include other information. RRC Connection Resume kind of message can optionally include the dedicated radio resource configuration. FFS Whether RRC Connection Resume Complete includes NAS PDU, 5CN node selection information (e.g. selected PLMN identity or NSSAI).

The content of the RRC messages for RRC connection resume are listed in the table 1.

**Table 2 content of the RRC messages for RRC connection resume**

RRC message	Content in LTE	Proposed Content in NR
<i>RRCConnectionResumeRequest</i>	<ul style="list-style-type: none"> <li>● resumeIdentity-r13</li> <li>● shortResumeMAC-I-r13</li> <li>● resumeCause-r13</li> </ul>	<ul style="list-style-type: none"> <li>● resumeIdentity-r13</li> <li>● UE's security information (e.g. authentication token)</li> <li>● resumeCause-r13</li> </ul>
<i>RRCConnectionResume</i>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● radioResourceConfigDedicated-r13(for all SRBs and DRBs)</li> <li>● nextHopChainingCount-r13</li> </ul>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● radioResourceConfigDedicated-r13(for all SRBs and DRBs)</li> </ul>

	<ul style="list-style-type: none"> <li>● measConfig-r13</li> <li>● antennaInfoDedicatedPCell-r13</li> <li>● drb-ContinueROHC-r13</li> </ul>	<ul style="list-style-type: none"> <li>● nextHopChainingCount-r13</li> <li>● measConfig-r13</li> <li>● antennaInfoDedicatedPCell-r13</li> <li>● drb-ContinueROHC-r13</li> </ul>
<i>RRCConnectionResumeComplete</i>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● selectedPLMN-Identity-r13</li> <li>● dedicatedInfoNAS-r13</li> <li>● rlf-InfoAvailable-r13</li> <li>● logMeasAvailable-r13</li> <li>● connEstFailInfoAvailable-r13</li> <li>● mobilityState-r13</li> <li>● mobilityHistoryAvail-r13</li> <li>● logMeasAvailableMBSFN-r13</li> </ul>	<ul style="list-style-type: none"> <li>● rrc-TransactionIdentifier</li> <li>● selectedPLMN-Identity-r13</li> <li>● dedicatedInfoNAS-r13</li> </ul>
<i>RRCConnectionReject</i>	<ul style="list-style-type: none"> <li>● rrc-SuspendIndication-r13</li> </ul>	<ul style="list-style-type: none"> <li>● rrc-SuspendIndication-r13</li> </ul>

For *RRCConnectionResumeRequest*, *RRCConnectionResume* and *RRCConnectionReject* messages, all parameters for LTE are also needed in NR, except that in *RRCConnectionResumeRequest* it is FFS whether the UE's security information is shortResumeMAC-I. As to *RRCConnectionReject* message, although in light connection a new rrc-LightConnectionIndication is introduced to indicate that the UE should remain lightly connected and not release its stored context if present [4], whether MSG 4 can be a reject to idle is for further study in case of inactive state. If it is agreed that MSG 4 can be a reject to idle afterwards, this kind of indication should be added in Table 2.

For *RRCConnectionResumeComplete* message, the IEs *rlf-InfoAvailable-r13*, *logMeasAvailable-r13*, *connEstFailInfoAvailable-r13* and *logMeasAvailableMBSFN-r13* are related to MDT/SON which are not supported in NR phase I. The IEs *mobilityState-r13* and *mobilityHistoryAvail-r13* are related to UE mobility history which is not supported in NR phase I. So only IEs *rrc-TransactionIdentifier*, *selectedPLMN-Identity-r13* and *dedicatedInfoNAS-r13* are needed in NR. The RRC connection resume procedure is used for all SRBs and DRBs resumption and re-activation of security and, so the following parameters are proposed to support.

**Proposal 4: Support the following parameters for the RRC messages in RRC connection resume procedure, the details of each parameter can be discussed further:**

- ***RRCConnectionResumeRequest*: Resume ID, Resume Cause, UE's security information**
- ***RRCConnectionResume*: Transaction ID, dedicated radio resource configuration for all SRBs and DRBs, NCC, measurement Configuration, antenna info, Continue ROHC for DRB**
- ***RRCConnectionResumeComplete*: Transaction ID, selected PLMN ID, dedicated NAS info.**
- ***RRCConnectionReject*: Suspend Indication**

### 2.3. Comparison of RRC connection re-establishment and resume

Comparison can be made based on the analysis of section 2.1 and 2.2. The details are shown below:

- RRC re-establishment is used for connected mode UE, and RRC resume is used for inactive mode UE. In these two cases, the network both has UE's AS context.
- They are both used to re-active the security.
- RRC re-establishment can resume SRB1, and RRC resume can resume all SRBs and DRBs.
- From the procedure point of view, the successful and reject procedures are similar. The RRC resume procedure has a fallback mechanism to RRC connection establishment, which is not supported by RRC re-establishment.
- From the content point of view:



- both *RRCConnectionReestablishmentRequest* and *RRCConnectionResumeRequest* have UE ID and cause, although the details are not the same. And the latter has just one more parameter, i.e. UE's security information.
- Both *RRCConnectionReestablishment* and *RRCConnectionResume* have Transaction ID, dedicated radio resource configuration and NCC, and the latter has more parameters for other purpose.
- Both *RRCConnectionReestablishmentComplete* and *RRCConnectionResumeComplete* have Transaction ID, and the latter has more parameters for other purpose.
- For reject case, only reject message for resume procedure has a Suspend Indication.

So there are many commonalities between RRC connection re-establishment procedure and RRC connection resume procedures. Thus it should be aim to combine the RRC messages used for RRC connection re-establishment procedure and RRC connection resume procedure.

**Proposal 5: Aim to combine the following RRC messages for NR:**

- *RRCConnectionReestablishmentRequest* and *RRCConnectionResumeRequest*
- *RRCConnectionReestablishment* and *RRCConnectionResume*
- *RRCConnectionReestablishmentComplete* and *RRCConnectionResumeComplete*
- *RRCConnectionReestablishmentReject* and *RRCConnectionReject*

### 3. Conclusion

In this contribution, we discuss the individual procedures for RRC connection re-establishment and resume, and propose:

**Proposal 1: Support the successful and failure procedures for RRC connection re-establishment in NR.**

**Proposal 2: Support the following parameters for the RRC messages in RRC connection re-establishment procedure, the details of each parameter can be discussed further:**

- *RRCConnectionReestablishmentRequest*: UE ID, Re-establishment Cause
- *RRCConnectionReestablishment*: Transaction ID, dedicated radio resource configuration for SRB1, NCC
- *RRCConnectionReestablishmentComplete*: Transaction ID

**Proposal 3: Support the successful resume, fallback to RRC connection establishment and either network reject or release procedures for RRC connection resume in NR.**

**Proposal 4: Support the following parameters for the RRC messages in RRC connection resume procedure, the details of each parameter can be discussed further:**

- *RRCConnectionResumeRequest*: Resume ID, Resume Cause, UE's security information
- *RRCConnectionResume*: Transaction ID, dedicated radio resource configuration for all SRBs and DRBs, NCC, measurement Configuration, antenna info, Continue ROHC for DRB
- *RRCConnectionResumeComplete*: Transaction ID, selected PLMN ID, dedicated NAS info.
- *RRCConnectionReject*: Suspend Indication

**Proposal 5: Aim to combine the following RRC messages for NR:**

- *RRCConnectionReestablishmentRequest* and *RRCConnectionResumeRequest*
- *RRCConnectionReestablishment* and *RRCConnectionResume*
- *RRCConnectionReestablishmentComplete* and *RRCConnectionResumeComplete*
- *RRCConnectionReestablishmentReject* and *RRCConnectionReject*

### 4. Reference

[1] RAN2#97bis, Chairman notes.

[2] RAN2#99, Chairman notes.

[3] RAN2#98, Chairman notes.

[4] R2-1701689, Light Connection Feature specification in 36.331 - TP agreements and outcome of email discussion [96#66], RAN2#97.

# **APPENDIX D**

**3GPP TSG-RAN WG2 meeting #101**

**R2-1801701**

**Athens, Greece, 26 February - 2 March, 2018**

**Agenda Item:** 2.2

**Source:** ETSI MCC

**Title:** Report of 3GPP TSG RAN2#100 meeting, Reno, Nevada, USA

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**Document for:** Approval

**Report of 3GPP TSG RAN WG2 meeting #100  
Reno, Nevada, USA  
27 November - 1 December, 2017**

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## Organisation of the meeting

Meeting:	3GPP TSG RAN2#100	
Meeting location:	Reno, Nevada, USA	
Duration:	27.11 - 1.12.2017	
Host:	EF3	
TSG RAN WG2 Chairman:	Richard Burbidge (Intel Corporation) (richard.c.burbidge@intel.com)	
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Technical documents:	ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_100/Docs	
Next meetings:	TSG RAN#78	18.12 - 21.12.2017, Lisbon, Portugal
	TSG RAN2#NR_1801	22.01 - 26.01.2018, Vancouver, Canada
	TSG RAN2#101	26.02 - 03.02.2018, Athens, Greece

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## Statistics/Executive Summary

TSG RAN2#100 was held in Prague, Czech Republic, hosted by European Friends of 3GPP (EF3). The meeting had 5 breakout sessions in addition to the main session. The main session was mainly about NR and NR control plane. The parallel sessions were:

- LTE and NR User Plane;
- LTE
- NB-IoT and MTC
- Rel-15 V2X
- Rel-15 MTC

The statistics from this meeting are:

- 285 participants checked in (registered: 362 participants).
- 2190 Tdoc numbers allocated with 2089 available contributions. (See the attached tdoc list)
- 97 incoming liaison statements, out of which 96 were noted and 1 was withdrawn (was treated already in the previous meeting).
- 29 outgoing liaison statements.
- 45 email approvals/discussions scheduled after RAN2#100 meeting, see Annex F for details.
- Number of CRs submitted 326. Out of these, 104 were agreed. See Annex E for details.

---

# 1 Opening of the meeting (9 AM)

## 1.1 Call for IPR

The attention of the delegates of this Working Group is drawn to the fact that **3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective Organizational Partners of Essential IPRs** they become aware of.

The delegates were asked to take note that they were hereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.
- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Statement and the Licensing declaration forms (<http://webapp.etsi.org/Ipr/>).

*NOTE: IPRs may be declared to the Director-General or Chairman of the SDO, but not to the RAN WG2 Chairman.*

## 1.2 Network usage conditions

*The PCG has laid down the following network usage conditions*

**1. Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.**

**2. Users shall not engage in non-work related activities that consume excessive bandwidth** or cause significant degradation of the performance of the network.

Since the network is a shared resource, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

- 1. DON'T place your WiFi device in ad-hoc mode**
- 2. DON'T set up a personal hotspot in the meeting room**
- 3. DO try 802.11a if your WiFi device supports it**
- 4. DON'T manually allocate an IP address**
- 5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files**
- 6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)**

## 1.3 Other

In accordance with the Working Procedures it is reaffirmed that:

(i) compliance with all applicable antitrust and competition laws is required;

(ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full

and fair consideration of such matters; and

(iii) the chairman will conduct the meeting with strict impartiality and in the interests of 3GPP

*Note on (i): In case of question please contact your legal counsel.*

*Note on (ii): WIDs don't need to be submitted to the RAN2 meeting and will typically not be discussed here either.*

---

## 2. General

*THANK YOU to companies that request TDoc numbers and submit contributions early before deadline (really appreciated). Will start to refrain from treating late documents.*

### 2.1 Approval of the agenda

*A draft schedule for the week is provided as a separate document, distributed via the RAN2 email reflector and made available during the meeting week in the RAN2\Inbox\Chairmans\_Notes folder.*

R2-1712100 Agenda for RAN2#100 Chairman agenda  
=> Approved

### 2.2 Approval of the report of the previous meeting

R2-1712101 RAN2#99bis Meeting Report MCC report  
=> Approved

### 2.3 Reporting from other meetings

### 2.4 Others

R2-1713911 RAN2 Compendium MCC other  
=> Noted

#### **Rapporteur changes**

**Spec former rapporteur proposed new rapporteur**

#### **Isolated impact analysis**

Note that an isolated impact analysis is required for Rel-8 to Rel-14 CRs from Q3 2017 onwards.

Only corrections where there is a proven problem are allowed for frozen releases (Rel-8 to Rel-14).

#### **RAN2 WG compendium**

Latest version can always be found at [ftp://ftp.3gpp.org/tsg\\_ran/WG2\\_RL2/Org/RAN2\\_Compndium/](ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/Org/RAN2_Compndium/)

#### **Drafting rules**

Note that specification drafting rules in TR 21.801 must be followed when drafting a CR and draft TS/TR.

Latest version can always be found at [http://www.3gpp.org/ftp/specs/archive/21\\_series/21.801/](http://www.3gpp.org/ftp/specs/archive/21_series/21.801/)

#### **Time Budget**

The time budget endorsed at RAN-77 is available in RP-172116

#### **Offline discussion during RAN2 meeting**

Chairs will allocate a number of offline discussions during the meeting. Create a folder starting with this number within inbox/drafts and use this to share any documents relating to the offline discussion (please use format "nnn-....", i.e. a 3 digit number). Also use this number in the title of any reflector emails relating to this offline discussion. (please use format "[100 Offline#nnn]....."). Do not share documents over the reflector during the meeting

### 3 Incoming liaisons

*Note: LSs are moved to the respective agenda items if any.*

*Liaisons to RAN2*

R2-1712107 Reply LS on the number of bearers (C1-174658; contact: Samsung) CT1 LS in Rel-15 TEI15 To:SA2, RAN2 Cc:CT4, RAN, CT, SA, SA1  
=> We will wait for SA2 to respond before taking more action on this.  
=> Noted

R2-1712110 LS on 2Gbps category (R1-1719084; contact: Qualcomm) RAN1 LS in Rel-14 TEI14  
To:RAN2, RAN  
- Qualcomm confirm that the CR RAN1 looked at is identical to what we agreed in principle last meeting.  
- Nokia think that there is an error with the fallback category in the CRs seen last meeting. The CRs provided into this meeting are already updated.  
=> Noted

R2-1712135 Reply to Reply LS on LTE call redirection to GERAN (S3c0011; contact: Nokia) SA3 LS in Rel-15 TEI15 To:CT1, RAN2, RAN3  
=> Noted

R2-1712151 Reply LS to RAN 2 on QCIs for EPC based ULLC (S2-178150; contact: Vodafone) SA2 LS in Rel-15 LTE\_sTTIandPT, EDCE5, LTE\_HRLLC, NR\_newRAT-Core To:RAN2, RAN3, SA1 Cc:RAN1, SA4, CT4  
- Ericsson think this should be discussed but not sure which agenda item.  
=> Contributions to be treated after lunch on Monday to see if anything can be responded to SA2.  
=> Noted

*Liaisons with RAN2 in CC*

R2-1712147 Reply LS on MBMS bearer event notification (S2-177582; contact: Ericsson) SA2 LS in Rel-15 MBMS\_Mcservices To:SA6, RAN3 Cc:RAN2  
R2-1712160 LS answer to LS on EUTRAN sharing enhancement (S5-175461; contact: Ericsson) SA5 LS in Rel-14 TEI14 To:SA2 Cc:RAN2, RAN3, RAN, SA  
R2-1712299 Reply LS on the number of bearers (C4-175345; contact: Nokia) CT4 LS in Rel-15 TEI15 To:SA2 Cc:CT1, RAN2, RAN, CT, SA, SA1  
=> LSs above are all noted

*New LS in (during RAN2#100)*

R2-1714180 Reply LS on the number of bearers (S2-179536; contact: Samsung) SA2 LS in Rel-15 TEI15 To:RAN2, CT1, CT4, RAN, SA, CT Cc:SA1  
=> Noted

*Contributions related to incoming LSs*

R2-1713349 On QCIs for EPC based ULLC Ericsson discussion Rel-15 NR\_newRAT-Core, LTE\_HRLLC, LTE\_sTTIandPT, EDCE5  
- Vodafone explain the LS was only addressed requirement for normal latency, not directed at URLLC. There is also a separate SA2 WI on URLLC and will look at the 1ms delay requirement and most likely SA2 will add a QCI for that case.  
- Qualcomm think we need to target SA1 requirement. Vodafone think RAN is not addressing this requirement in Rel-15.  
P2  
- Samsung think we did not agree this for NR and so wonder if it is needed for LTE. Ericsson think this is not concluded for 5G yet but think it will be needed.

P4

- Nokia think we should focus on interfaces that support inter vendor.
- Samsung wonder if this is up to RAN2 to discuss, and also it should not be vendor specific.
- DT think this should be discussed in RAN3.
- Ericsson think RAN2 could indicate that the container approach is feasible.
- Vodafone think that previous RAN2 request parameters on various things it is difficult for the CN to provide. Also the eNB can pick up the traffic pattern quite easily and store the info in the CN which can then be provided back to the RAN.
- Huawei is not sure how the traffic pattern can be learnt by the RAN, as this should be transparent to the RAN.

**Agreement**

- 1 Respond to SA2 that RAN2 preference is that at least one PDB value expressing tighter latency requirements (include value of reliability/packet size/radio delay related to what can be achieved with sTTI) should be added to the set of standardized QCI(s) for URLLC.
  - 2 Respond to SA2 that RAN2 preference is that for the GBR QCI's for URLLC, a maximum burst size is defined. It defines the largest amount of data that the application can expect to be transmitted within the radio delay requirement.
- FFS: Whether the maximum burst size needs to be considered for NR as well.
- 3 Respond to SA2 that RAN2 preference is that GBR QCI's are defined for the discrete automation use case.

=> Draft LS response in R2-1714075 (Offline discussion #06, Ericsson)

R2-1714075 [DRAFT] Reply LS on QCIs for EPC based ULLC Ericsson LS out Rel-15 NR\_newRAT-Core To:SA2  
=> Approved in R2-1714136

## 4-5 Void

## 6 LTE: Rel-12 and earlier releases

*Including corrections related to the following WIs:*

- (LTE-L23, leading WG: RAN2, REL-8, started: Sep. 06, closed: Dec. 08, WID: RP-080747)
- (LTE\_CA-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: RP-100661)
- (LTE\_UL\_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: June 11, WID: RP-100959)
- (LTE\_eDL\_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: March 11, WID: RP-100196)
- (LTE\_Relay-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: RP-110911)
- (MBMS\_LTE\_enh-Core, leading WG: RAN2, REL-10, started: June 10, closed: March 11, WID: RP-101244)
- (MDT\_UMTSLTE-Core, leading WG: RAN2, REL-10, started: Dec. 09, closed: June 11, WID: RP-100360)
- (eICIC\_LTE-Core, leading WG: RAN1, REL-10, started: March 10, closed: June 11, WID: RP-100383)
- (SONenh\_LTE-Core, leading WG: RAN3, REL-10, started: March 10, closed: June 11, WID: RP-101004)
- (LTE\_CA\_enh-Core, leading WG: RAN1, REL-11, started: March 11, closed: Mar.13, WID: RP-121999)
- (MBMS\_LTE\_SC-Core, leading WG: RAN2, REL-11, started: June 10, closed: Sep.12, WID: RP-120258)
- (LTE\_eDDA-Core, leading WG: RAN2, REL-11, started: March 11, closed: Dec.12, WID: RP-120256)
- (LCS\_LTE-NBPS-Core, leading WG: RAN2, REL-11, started: March 09, closed: June. 13, WID: RP-131259)
- (eICIC\_enh\_LTE-Core, leading WG: RAN1, REL-11, started: March 11, closed: Dec. 12, WID: RP-120860)
- (SPIA\_IDC\_LTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec. 12, WID: RP-111355)
- (COMP\_LTE\_DL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: RP-111365)
- (COMP\_LTE\_UL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: RP-111365)
- (LTE\_TDD\_add\_subframe, leading WG: RAN1, REL-11, started: March 12; closed: Sep. 12, WID: RP-120384)
- (FS\_HetNet\_eMOB\_LTE, leading WG: RAN2, REL-11, started: March 11, closed: Sep. 12, WID: RP-110709)
- (LTE\_enh\_dl\_ctrl-Core, leading WG: RAN1, REL-11, started: Dec. 11, closed: Dec. 12, WID: RP-120871)
- (LTE\_SC\_enh\_dualC-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Dec.14, WID: RP-141797)
- (LTE\_SC\_enh\_L1-Core, leading WG: RAN1, REL-12, started: Dec.13, closed: Dec.14, WID: RP-132073)
- (LTE\_D2D\_Prox-Core, leading WG: RAN1, REL-12, started: Mar.14, closed: Mar.15, WID: RP-142043)
- (MBMS\_LTE\_OS-Core, leading WG: RAN2, REL-12, started: Sep.13, closed: Dec.14, WID: RP-140282)
- (LTE\_NAICS-Core, leading WG: RAN1, Rel-12, started: Mar 14, closed: Dec.14, WID: RP-140519)
- (LC\_MTC\_LTE-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Dec 14, WID: RP-140522)
- (GCSE\_LTE-MBMS\_CM-Core, leading WG: RAN3, started: Sep. 14, closed: Mar. 2015, WID: RP-141035)
- (LTE\_CA\_TDD\_FDD-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Jun 14, WID: RP-140465)



(LCS\_BDS-LTE-Core, leading WG: RAN2, REL-12, started: Mar 13, closed: Dec 13, WID: RP-130416)  
 (LTE\_eDL\_MIMO\_enh-Core, leading WG: RAN1, REL-12, started: Sep 12, closed: June 14, WID: RP-121416)  
 (HetNet\_eMOB\_LTE-Core, leading WG: RAN2, REL-12, started: Dec.12, , closed: Sep 14, WID: RP-122007)  
 (Cov\_Enh\_LTE-Core, leading WG: RAN1, REL-12, started: Jun.13, closed: Jun.14, WID: RP-130833)  
 (LTE\_TDD\_eIMTA-Core, leading WG: RAN1, REL-12, started: Dec 12, closed: Jun.14, WID: RP-121772)  
 (SCM\_LTE-Core, leading WG: RAN2, REL-12, started: Mar.14, closed: Sep.14, WID: RP-140434)

Including any LTE corrections related to the following joint UMTS/LTE WIs:

(SIMTC-RAN\_OC-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Sep. 12, WID: RP-111373)  
 (eMDT\_UMTSLTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec.12, WID: RP-121204)  
 (SONenh2\_LTE\_UTRA-Core, leading WG: RAN3, REL-11, started: Sep.11, closed: Dec.12, WID: RP-120314)  
 (rSRVCC-GERAN, leading WG: GERAN2, REL-11, started: Sep.11, closed: Nov.13, WID: GP-111290)  
 (EHNB\_enh3-Core, leading WG: RAN3, REL-12, started: Sep.12, closed: Dec 13, WID: RP-130741)  
 (MTCe\_RAN-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: RP-132053)  
 (UTRA\_LTE\_WLAN\_interw-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: RP-132101)  
 (LTE\_UTRA\_IncMon-Core, leading: RAN4, REL-12, started: Dec.13, closed: Dec. 14, WID: RP-132061)

## 6.0 In principle agreed CRs

*Documents in this agenda item will be handled in a break out session*

R2-1713540	DCI monitoring subframes for eIMTA 12 36.331 12.15.1 3188 - => The CR is agreed	Huawei Technologies Sweden AB F LTE_TDD_eIMTA-Core	CR	Rel-
R2-1713542	DCI monitoring subframes for eIMTA 13 36.331 13.7.1 3189 - => The CR is agreed	Huawei Technologies Sweden AB A LTE_TDD_eIMTA-Core	CR	Rel-
R2-1713545	DCI monitoring subframes for eIMTA 14 36.331 14.4.0 3190 - => The CR is agreed	Huawei Technologies Sweden AB A LTE_TDD_eIMTA-Core	CR	Rel-

## 6.1 Other

*Including output of email discussion [99bis#45][LTE/IDC] – UL CA IDC problems- Nokia*

R2-1712311	UE capabilities for Tx antenna selection Rel-13 36.331 13.7.0 3080 2 - Nokia asks if it known what switchtogether means. We can clarify or refer to a RAN1 spec. - Nokia asks if we need to notify RAN4 => The CR is revised in R2-1714036	Qualcomm Incorporated, Ericsson, SoftBank F LTE_CA_TDD_FDD-Core	CR	R2-1710551
R2-1714036	UE capabilities for Tx antenna selection Agreement R2-1710551, R2-1712311 LTE_CA_TDD_FDD-Core 3080 3 F [CB 500]	Qualcomm Incorporated, Ericsson, SoftBank F	CR	Rel-13 36.331 13.7.0
R2-1712312	UE capabilities for Tx antenna selection Rel-14 36.331 14.4.0 3081 1	Qualcomm Incorporated, Ericsson, SoftBank A LTE_CA_TDD_FDD-Core	CR	R2-1710552
R2-1712313	UE capabilities for Tx antenna selection Rel-13 36.306 13.7.0 1510 2 => The CR is revised in R2-1714037	Qualcomm Incorporated, Ericsson, SoftBank F LTE_CA_TDD_FDD-Core	CR	R2-1711846
R2-1714037	UE capabilities for Tx antenna selection Rel-13 36.306 13.7.0 LTE_CA_TDD_FDD-Core [CB]	CR Agreement 1510 3 F	CR	R2-1711846, R2-1712313
R2-1712314	UE capabilities for Tx antenna selection Rel-14 36.306 14.4.0 1511 1	Qualcomm Incorporated, Ericsson, SoftBank A LTE_CA_TDD_FDD-Core	CR	R2-1710554
R2-1712348	Report of email discussion 99bis#45 LTE UL CA IDC problems report Rel-11	Nokia, Nokia Shanghai Bell		

### **RAN2 common understanding**

**1:** The UE always sets the complete assistance information, i.e. complete set of frequencies affected by IDC problems.

- 2: The UE-generated *affectedCarrierFreqCombList* IE does not link its validity to the time of current UL CA configuration, but to actual IDC problem for the configured measurement object.
- 3: If the UE is no longer experiencing UL CA IDC problems it shall send empty *InDeviceCoexIndication-r11* message with omitted *InDeviceCoexIndication-11d0-IEs*.
- 4: There is converged understanding on expected UE behaviour for handling UL CA IDC problems and no need for specification clarification was identified.
- 5: No specification updates are required

- R2-1713154 Releasing CQI-ReportConfig Nokia, Nokia Shanghai Bell discussion Rel-10  
 - Qualcomm thinks nothing is broken so we don't need to go to Rel-10  
 - Nokia's intention is to have a CR for Rel-14 only.  
 => The intention is that cqi-ReportConfig Indicates the currently use CQI reportinc configuration for the serving cell. NOTE 1.  
 => Noted
- R2-1713549 Tabel 8.2-2 reformatting Ericsson CR Rel-12 36.302 12.8.0 1189 - F  
 TEI12  
 - Qualcomm asks what happens if we add more rows – do we have to clarify that the NOTE doesn't apply to the row.  
 => The CR is not pursued
- R2-1713550 Tabel 8.2-2 reformatting Ericsson CR Rel-13 36.302 13.6.0 1190 - A  
 TEI12  
 => The CR is not pursued
- R2-1713551 Tabel 8.2-2 reformatting Ericsson CR Rel-14 36.302 14.3.0 1191 - A  
 TEI12  
 => Update to category F and WI code should be TEI14  
 => The CR is updated to include the changes of R2-1713492  
 => The CR is revised in R2-1714038
- R2-1714038 Tabel 8.2-2 reformatting CR R2-1713551 Rel-14 36.302 14.3.0 TEI12  
 1191 1 F  
 [CB 504]

*This will be treated in main session*

- R2-1712402 Secured redirect to GERAN Ericsson discussion Rel-12 TEI12
- R2-1712403 Draft Reply LS on LTE call redirection to GERAN Ericsson discussion Rel-12 TEI12
- R2-1712404 Reject of unprotected redirect to GERAN Ericsson CR Rel-14 36.331 14.4.0 3132  
 - F TEI14
- R2-1713152 Resolving the unsecured GERAN redirection issue Nokia, Nokia Shanghai Bell discussion  
 Rel-13 TEI13
- R2-1713153 Resolving the GERAN redirection security issue Nokia, Nokia Shanghai Bell CR Rel-14  
 36.331 14.4.0 3170 - F TEI13

## 7 LTE: Rel-13

### 7.1 WI: Further LTE Physical Layer Enhancements for MTC

(LTE\_MTCe2\_L1-Core, leading WG: RAN1, REL-13; started: Sep. 14, closed: Mar. 16, WID: RP-150492)

*Documents in this agenda item will be handled in a break out session*

#### LS in

- R2-1712111 LS on MBSFN subframe configuration in handover signalling for eMTC (R1-1719091; contact: Qualcomm) RAN1 LS in Rel-13 LTE\_MTCe2\_L1 To:RAN2  
 - QC think that R2 need to make the correction that Rel-13 assumption is used when MBSFN subframe config is not provided. There is a CR.

⇒ **noted**

## 7.1.0 In principle agreed CRs

R2-1713088 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
 CR Rel-13 36.331 13.7.0 3045 3 F LTE\_MTCe2\_L1-Core R2-1711881  
 - Ericsson think that the summary of change only indicates one of the affected subclauses and is thus not fully correct.  
 - Work with Ericsson to produce a good summary.  
 ⇒ **Revised in R2-1713963 (rev 4) which is agreed unseen**

R2-1713089 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
 CR Rel-14 36.331 14.4.0 3046 2 A LTE\_MTCe2\_L1-Core R2-1711211  
 ⇒ **Revised in R2-1713964 (rev 3) which is agreed unseen**

R2-1713222 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
 CR Rel-13 36.300 13.9.0 1054 3 F LTE\_MTCe2\_L1-Core R2-1711882  
 ⇒ **Agreed**

R2-1713091 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
 CR Rel-14 36.300 14.4.0 1055 3 A LTE\_MTCe2\_L1-Core R2-1711213  
 ⇒ **Tick the RAN box, Revised in R2-1713965 (rev 4), agreed unseen**

R2-1713094 Correction to description of uplink and downlink shared channel physical layer model for MTC and NB-IoT. Huawei, HiSilicon CR Rel-13 36.302 13.6.0 0116 2 F  
 LTE\_MTCe2\_L1-Core, NB\_IOT-Core R2-1711887  
 ⇒ **agreed**

R2-1713095 Correction to description of uplink and downlink shared channel physical layer model for MTC and NB-IoT. Huawei, HiSilicon CR Rel-14 36.302 14.3.0 0117 1 A  
 LTE\_MTCe2\_L1-Core, NB\_IOT-Core R2-1711233  
 ⇒ **agreed**

R2-1713624 Alignment of FGI4 (Short DRX) for Cat M1 Ericsson CR Rel-13 36.331 13.7.1 3119  
 1 F LTE\_MTCe2\_L1-Core R2-1711644  
 - Huawei think the date is wrong.  
 ⇒ **agreed**

R2-1713625 Alignment of FGI4 (Short DRX) for Cat M1 and M2 Ericsson CR Rel-14 36.331  
 14.4.0 3120 1 F LTE\_MTCe2\_L1-Core R2-1711645  
 ⇒ **agreed**

*Withdrawn*

R2-1713090 Corrections on paging monitoring in RRC\_CONNECTED in Rel-13 eMTC Huawei, HiSilicon  
 CR Rel-13 36.300 13.9.0 1055 2 F LTE\_MTCe2\_L1-Core R2-1711213

## 7.1.1 Other

### Terminology and CE barring

R2-1712634 Introducing a definition for the term UE in CE Intel Corporation, Ericsson, Huawei, HiSilicon,  
 LG CR Rel-13 36.331 13.7.0 3139 - F LTE\_MTCe2\_L1-Core  
 - Ericsson think that the main part of the issue is whether a normal UE in normal coverage can access a network in CE mode, e.g. due to power consumption saving, so Ericsson think this opens up an agreement from the past.  
 - QC think that "intends to" means that the UE want to also do the RACH in CE mode.  
 - Sequans think that the "intends to" changes previous definitions.  
 - Intel think that if "intends to" is problematic we can remove it.

- Intel think that in the situation that the UE is configured it is clear. Huawei point out that the RACH procedure alternative is determined by the S criteria in 36.304. ZTE agrees with this. Gemalto agrees that the standard is clear.
  - Thus, there is currently no ambiguity in Stage-3 w.r.t. "intends to". The UE intention at RACH is fully defined by radio measurement comparison to S criteria.
  - Chair wonders if we should have identical definitions in 36.300 and 36.331
  - Ericsson think this definition is better than the current one in 36.300, but would prefer to not use "intends to"
- ⇒ **Use the following definition: "UE in CE: Refers to a UE that is capable of using coverage enhancement, and requires coverage enhancement mode to access a cell or is configured in a coverage enhancement mode."**
- ⇒ **Revised in R2-1713967, which is agreed unseen.**

R2-1712635 Introducing a definition for the term UE in CE Intel Corporation, Ericsson, Huawei, HiSilicon,  
 LG CR Rel-14 36.331 14.4.0 3140 - A LTE\_MTCe2\_L1-Core  
 ⇒ **Revised in R2-1713968, which is agreed unseen.**

R2-1713100 Correction to cell barring for coverage enhancement Huawei, HiSilicon, Intel Corporation  
 CR Rel-13 36.304 13.7.0 0396 - F LTE\_MTCe2\_L1-Core  
 - Ericsson suggests to edit offline  
 - ZTE think this is not needed. ZTE are concerned that this may involve additional requirement to check the radio conditions of a cell.  
 - QC think there are no additional requirements.  
 ⇒ **No intention to impose additional requirements on the UE**

Work offline (302), revisions in R2-1713969 & 70 (Huawei).

R2-1713969 Correction to cell barring for coverage enhancement Huawei, HiSilicon, Intel Corporation  
 CR Rel-13 36.304 13.7.0 0396 - F LTE\_MTCe2\_L1-Core  
 ⇒ **agreed**

R2-1713101 Correction to cell barring for coverage enhancement Huawei, HiSilicon, Intel Corporation  
 CR Rel-14 36.304 14.4.0 0397 - A LTE\_MTCe2\_L1-Core  
 ⇒ **revised**

R2-1713970 Correction to cell barring for coverage enhancement Huawei, HiSilicon, Intel Corporation  
 CR Rel-14 36.304 14.4.0 0397 - A LTE\_MTCe2\_L1-Core  
 ⇒ **agreed**

R2-1713223 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
 CR Rel-13 36.331 13.7.0 3095 3 F LTE\_MTCe2\_L1-Core R2-1711886  
 - Ericsson proposes further changes.  
 - ZTE think we might need to change SIB5 as well. There is no field description for SIB5. Sequans agrees and think explanations can be added for absence.  
 - Intel think these parameters are both for intra and inter-frequency. Huawei think that also inter-frequency values are needed, but they are different than these.  
 - QC agrees with this change, and think that the proposal gives the possibility to use configuration for intrafreq neighbours that is different to serving cell.  
 - Intel think we should say that the fields in SIB3 are for intra and inter-freq, but if SIB5 value is provided then SIB3 values don't apply to interfreq.  
 - Huawei think that there are cases when CE is provided only on the current frequency, and would for such cases not like to have a common value for intra and inter-freq.  
 - Intel wonders what happens if values are absent. Intel indicate that for legacy the qrxlevmin is always provided.  
 ⇒ **Values in SIB3 is for intra-freq, SIB5 is used for Inter-freq**  
 ⇒ **The behaviour at absence need to be specified.**

Offline (303), revisions in R2-1713971 & 72 (Huawei).

- R2-1713971 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
 CR Rel-13 36.331 13.7.0 3095 4 F LTE\_MTCe2\_L1-Core R2-1711886  
 - ZTE think that for the parameters CE1 the field description text is different for the SIBs.  
 ⇒ **Revised, make field descriptions consistent**

Revisions in R2-1713997 & 98 (Huawei)

- R2-1713997 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
 CR Rel-13 36.331 13.7.0 3095 5 F LTE\_MTCe2\_L1-Core R2-1711886  
 - ZTE think that for the parameters CE1 the field description text is different for the SIBs.  
 ⇒ **agreed**

- R2-1713224 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
 CR Rel-14 36.331 14.4.0 3096 2 A LTE\_MTCe2\_L1-Core R2-1711231  
 ⇒ **revised**

- R2-1713972 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
 CR Rel-14 36.331 14.4.0 3096 3 A LTE\_MTCe2\_L1-Core R2-1711231  
 ⇒ **revised**

- R2-1713998 Corrections on field description of cellSelectionInfoCE for eMTC Huawei, HiSilicon, CMCC  
 CR Rel-14 36.331 14.4.0 3096 4 A LTE\_MTCe2\_L1-Core R2-1711231  
 ⇒ **agreed**

## PDCCH

- R2-1713671 Correction on PDCCH-subframe NTT DOCOMO INC. CR Rel-13 36.321 13.7.0 1200  
 - F LTE\_MTCe2\_L1-Core  
 - LG think that the current spec is ok and that this may impact also legacy LTE. Docomo clarifies that for legacy LTE the current text is ok, but for MTC with repetitions, the UE doesn't monitor PDCCH in every subframe and think thus that the clarification is needed.  
 - QC think that the UE cannot know which subframe is with PDCCH. Intel agrees. QC think that what could be clarified is possible the relation between DRX and partial PDCCH monitoring.  
 - Docomo are concerned about misunderstandings and the interpretation of DRX timers.  
 - Docomo think that the text can be changed somewhat ..  
 - Blackberry think that the first sentence "Refers to a subframe with PDCCH" makes it clear.  
 - Chair point out that if more specific problems can be identified they can be resolved of course.  
 ⇒ **Not pursued**

- R2-1713672 Correction on PDCCH-subframe NTT DOCOMO INC. CR Rel-14 36.321 14.4.0 1201  
 - A LTE\_MTCe2\_L1-Core  
 ⇒ **Not pursued**

## Handover

- R2-1713102 Correction to Radio Resource common configuration during CE->NC Handover for Rel-13 eMTC  
 Huawei, HiSilicon CR Rel-13 36.331 13.7.0 3167 - F  
 LTE\_MTCe2\_L1-Core  
 - Sequans think that a UE not configured to use CE mode A/B would not apply this configuration at all.  
 - QC think that if OR is applied then the information need to be provided very often which makes the HO cmd larger. LG agrees.  
 - Nokia wonders if the full configuration can be used. LG agrees and think that the target knows the SRC configuration. Intel agrees that full config can be used and point out that for RRC we don't use "non used / dangling configuration"  
 - Blackberry think that anyway this CR may not work as it will not be clear what behaviour a specific UE applies.  
 - Intel confirms that full configuration will work, and the previous configuration in the UE is completely removed, i.e. the CE related configuration will not remain if a UE is handed over to a eNB/cell that doesn't support CE and uses full configuration.  
 - There is not much support to do any change.

Report after offline (307)

- There seems to be mixed opinions, some companies think that full configuration is sufficient, some companies want to optimize.
  - Huawei would like to extend the proposal in the tdoc to also cover actual handover.
  - QC think there is a value in this and would like to make change to procedure text.
  - Intel still think this is not needed.
  - Huawei point out that delta configuration is very much desirable in this case as we are in CE and do repetitions etc. LG think we could make conditions to make this work. QC point out that this is an useful optimization.
  - Blackberry wonders how the network knows if the UE has implemented this.
  - Chair: there seems to be significant support to be able to use delta configuration
- ⇒ **postponed**

R2-1713103 Correction to Radio Resource common configuration during CE->NC Handover for Rel-13 eMTC  
 Huawei, HiSilicon CR Rel-14 36.331 14.4.0 3168 - A  
 LTE\_MTCe2\_L1-Core  
 ⇒ **Not pursued**

R2-1712292 MBSFN subframes for target cell during handover to CE cell Qualcomm Incorporated CR  
 Rel-13 36.331 13.7.1 3128 - F LTE\_MTCe2\_L1-Core  
 - Intel think this is already clear from the field description.  
 - LG think the text is needed but think that the word “may” should be “shall”. QC indicates that the “may” is for backwards compatibility.  
 - Huawei think this clarification is needed for the HO case.  
 - QC indicates that there is a typo  
 ⇒ **Use the text: “If the field is present when *SystemInformationBlockType1-BR-r13* is transmitted in *RRCCONNECTIONRECONFIGURATION*, the UE may assume the valid subframes in *fdd-DownlinkOrTddSubframeBitmapBR* are not indicated as MBSFN subframes.”**  
 ⇒ **Revised in R2-1713985 (rev1), which is agreed unseen**

R2-1712293 MBSFN subframes for target cell during handover to CE cell Qualcomm Incorporated CR  
 Rel-14 36.331 14.4.0 3129 - F LTE\_MTCe2\_L1-Core  
 ⇒ **Use the text: “If the field is present when *SystemInformationBlockType1-BR-r13* is transmitted in *RRCCONNECTIONRECONFIGURATION*, and if *RRCCONNECTIONRECONFIGURATION* does not include *systemInformationBlockType2Dedicated*, the UE may assume the valid subframes in *fdd-DownlinkOrTddSubframeBitmapB* are not indicated as MBSFN subframes.”**  
 ⇒ **Revised in R2-1713986 (rev1), which is agreed unseen**

R2-1712294 Reply LS on Issue with handovers in eMTC Qualcomm Incorporated discussion Rel-  
 13 LTE\_MTCe2\_L1-Core  
 ⇒ **Respond to the R1 question**  
 ⇒ **Attach agreed CRs**  
 ⇒ **Revised in R2-1713973**

R2-1713973 Reply LS on Issue with handovers in eMTC Qualcomm Incorporated discussion Rel-  
 13 LTE\_MTCe2\_L1-Core  
 ⇒ **Approved, final version in R2-1713999**

**UE Capabilities**

R2-1713041 TM6 capabilities in CE mode Ericsson, Sequans, Qualcomm Incorporated CR Rel-  
 13 36.306 13.7.0 1527 - F LTE\_MTCe2\_L1-Core  
 - QC think that CR number of affected spec should be added  
 ⇒ **Revised in R2-1713974 (rev 1), which is agreed unseen**

R2-1713042 TM6 capabilities in CE mode Ericsson, Sequans, Qualcomm Incorporated CR Rel-  
 14 36.306 14.4.0 1528 - A LTE\_MTCe2\_L1-Core  
 ⇒ **Revised in R2-1713975 (rev 1), which is agreed unseen**

- |            |   |   |    |      |
|------------|---|---|----|------|
| R2-1713043 | TM6 capabilities in CE mode<br>13 36.331 13.7.1 3159 -  | Ericsson, Sequans, Qualcomm Incorporated<br>F LTE_MTCe2_L1-Core | CR | Rel- |
|            | <ul style="list-style-type: none"> <li>- In the first added IE, QC think we don't need the first three OPTIONAL indications, and in the second added IE, the OPTIONAL is not needed.</li> <li>- QC think we should insert the numbers rather than xy.</li> </ul> <p>⇒ <b>Revised in R2-1713976 &amp; 77 (rev 1)</b></p> |   |    |      |
| R2-1713976 | TM6 capabilities in CE mode<br>13 36.331 13.7.1 3159 1  | Ericsson, Sequans, Qualcomm Incorporated<br>F LTE_MTCe2_L1-Core | CR | Rel- |
|            | ⇒ <b>agreed</b>   |   |    |      |
| R2-1713044 | TM6 capabilities in CE mode<br>14 36.331 14.4.0 3160 -  | Ericsson, Sequans, Qualcomm Incorporated<br>A LTE_MTCe2_L1-Core | CR | Rel- |
|            | ⇒ <b>revised</b>  |   |    |      |
| R2-1713977 | TM6 capabilities in CE mode<br>14 36.331 14.4.0 3160 -  | Ericsson, Sequans, Qualcomm Incorporated<br>A LTE_MTCe2_L1-Core | CR | Rel- |
|            | ⇒ <b>agreed</b>   |   |    |      |

Above 4 tdocs moved from 7.2

*Withdrawn*

- |            |  |  |  |            |
|------------|--|--|--|------------|
| R2-1713092 | Corrections on field description of cellSelectionInfoCE for eMTC<br>CR Rel-13 36.331 13.7.0 3096 1 | Huawei, HiSilicon, CMCC<br>F LTE_MTCe2_L1-Core |  | R2-1711231 |
| R2-1713093 | Corrections on field description of cellSelectionInfoCE for eMTC<br>CR Rel-14 36.331 14.4.0 3095 2 | Huawei, HiSilicon, CMCC<br>A LTE_MTCe2_L1-Core |  | R2-1711886 |

## 7.2 WI: Narrowband IOT

(NB\_IOT-Core; leading WG: RAN1; started: Sep. 15; target: Jun. 16; WID: RP-152284)  
*Documents in this agenda item will be handled in a break out session*

### LS in

- R2-1712146 LS on no dedicated bearer support over NB-IoT (S2-176723; contact: MediaTek) SA2 LS in  
 Rel-13 Clot To:RAN5, RAN2, CT1
- There is a CR
- ⇒ **Was already treated last meeting in the common session**

### 36.300

- R2-1712291 Clarification early contention resolution not supported in NB-IoT Qualcomm Incorporated CR  
 Rel-14 36.300 14.4.0 1070 - F NB\_IOT-Core, TEI14
- Ericsson think that we had a MAC CR and decided to not change.
  - Huawei think this is clear in R1 specifications.
  - Chair think that R1 specification determining when the UE switches to USS makes early contention resolution impossible. QC agrees. Nokia also think this is the case
  - Ericsson wonders if this is also for Rel-13. Huawei think it is also for Rel-13 but we don't need a CR for Rel-13. QC agrees. Nokia think we need a CR for Rel-13.
  - Huawei would be ok with a Rel-13 CR if it says on the cover sheet that this is just removing an inconsistency between Stage-3 and Stage-2.
- Check offline.
- QC reports that Early contention resolution cannot be done and cannot be changed for Rel-13 and Rel-14 and there is compatibility concerns so if this is to be changed it need to be done carefully. Nokia agrees and think we might need to send and LS to R1.
  - Ericsson think that the R1 specifications allows early contention resolution.
  - Chair think that the UE will start monitor USS when USS configuration is received.
  - QC think that for Rel-13 at least we need this clarification.
  - ZTE think we can agree this for Rel-13 but hopes that we can have early contention resolution for Rel-14
  - Chair think it is unavoidable to introduce this clarification for Rel-13
- ⇒ **It seems agreeable to clarify that early contention resolution is not supported for Rel-13, two UE vendors confirm that this has been the assumption, one network vendor want to check further.**
- ⇒ **Postpone to e.g. confirm the Rel-13 assumption and what can be done for Rel-14 and later**

### 36.331

- R2-1712983 NRS-CRS power offset configuration for NB-IoT ZTE Corporation, Sanechips discussion  
 Rel-13
- Chair wonders why R2 should discuss this as it was specified according to R1 decisions. Huawei also think this is a R1 issue. Ericsson think there is an issue that need to be fixed, and that R2 can fix this. Nokia are also not sure, but would refer to discuss first in R1. QC also think we need R1 updates.
- Check offline.
- ⇒ **noted**
- R2-1712994 NRS-CRS power offset configuration for NB-IoT ZTE Corporation, Sanechips CR Rel-  
 13 36.331 13.7.1 3152 - F NB\_IOTenh-Core
- ⇒ **Not pursued**
- R2-1713001 NRS-CRS power offset configuration for NB-IoT ZTE Corporation, Sanechips CR Rel-  
 14 36.331 14.4.0 3153 - F NB\_IOTenh-Core
- ⇒ **revised**
- R2-1713996 NRS-CRS power offset configuration for NB-IoT ZTE Corporation, Sanechips CR Rel-  
 14 36.331 14.4.0 3153 - F NB\_IOTenh-Core
- Ericsson wonders if the R1 CR has been agreed.



- Ericsson wonders if the R1 CR also includes other deployment cases, anchor SA – non-Anchor in-band. ZTE think this cases is covered.
- ZTE think that the most important case is Anchor-GuardBand and Non-Anchor inband.
- Huawei think this is ok, but think we could have a one week email check.
- Ericsson are ok with the R2 CR, but think the R1 CR need to be checked.
- Chair: The CR seems agreeable.

☒ **[100#12][NB-IoT R14] email discussion one week CR approval, NRS-CRS power offset configuration, mainly to check R1-R2 consistency (ZTE)**

Deadline: Thursday 2017-12-07

=> This CR is agreed in R2-1714250.

R2-1713215	NB-IoT UE capability extension correction	Nokia, Nokia Shanghai Bell	CR	Rel-13
	36.331 13.7.1 3174 - F NB_IOT-Core			
R2-1713221	NB-IoT UE capability extension correction	Nokia, Nokia Shanghai Bell	CR	Rel-14
	36.331 14.4.0 3177 - F NB_IOT-Core			

### 36.304

R2-1713129	Clarification on eDRX in NB-IoT	Nokia	CR	Rel-13	36.304	13.7.0	0398	-	F
	NB_IOT-Core								
	- QC and LG think that some wording need to be changed.								
	=> <b>We need an update as the current text seems wrong.</b>								
	=> <b>Revised, revisions in R2-1713960 &amp; 61</b>								

Perfect the wording offline (301) (Nokia).

R2-1713960	Clarification on eDRX in NB-IoT	Nokia	CR	Rel-13	36.304	13.7.0	0398	1	F
	NB_IOT-Core								
	=> <b>agreed</b>								
R2-1713180	Clarification on eDRX in NB-IoT	Nokia	CR	Rel-14	36.304	14.4.0	0399	-	A
	NB_IOT-Core								
	=> <b>revised</b>								
R2-1713961	Clarification on eDRX in NB-IoT	Nokia	CR	Rel-14	36.304	14.4.0	0399	1	A
	NB_IOT-Core								
	=> <b>agreed</b>								

## 7.3 Other LTE Rel-13 WIs

Including corrections related to the following WIs:

- (LTE\_LAA-Core, leading WG: RAN1, REL-13; started: June 15, closed: Dec. 15, WID: RP-151045)
- (LTE\_CA\_enh\_b5C-Core, leading WG: RAN1, REL-13; started: Dec. 14, closed: Dec. 15, WID: RP-151984)
- (LTE\_SC\_PTM-Core, leading WG: RAN2, REL-13; started: June 15, closed: Dec. 15, WID: RP-151110)
- (LTE\_eD2D\_Prox-Core, leading WG: RAN2, REL-13; started: Dec. 14, closed: Mar. 16, WID: RP-150441)
- (LTE\_MC\_load-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: RP-152181)
- (LTE\_dualC\_enh-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: RP-151739)
- (LTE\_extDRX-Core; leading WG: RAN2; started: Mar. 15; closed: Mar. 16; WID: RP-150493)
- (LTE\_EBF\_FDMIMO-Core; leading WG: RAN1; started: June. 15; closed: Dec. 15; WID: RP-151085)
- (LTE\_eMDT2-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: RP-151611)
- (UTRA\_LTE\_iPos\_enh-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: RP-152251)
- (LTE\_WLAN\_radio-Core, leading WG: RAN2, started: Mar. 15, closed: Mar. 16, WID: RP-152213)
- (LTE\_WLAN\_radio\_legacy-Core; leading WG: RAN2; started: Sep. 15; closed: Mar 15; WID: RP-151615)

Including any LTE corrections related to the following joint UMTS/LTE WIs:

- (ACDC-RAN-Core; leading WG: RAN2; REL-13; started: Mar. 15; closed: Dec. 15; RP-150662)

*Documents in this agenda item will be handled in a break out session*

### 7.3.0 In principle agreed CRs

- R2-1712288 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm  
Incorporated CR Rel-13 36.331 13.7.1 3106 2 F LTE\_SC\_PTM-Core  
R2-1711444  
=> The CR is agreed
- R2-1712289 Define requirement for reception of number of simultaneous SC-PTM services Qualcomm  
Incorporated CR Rel-14 36.331 14.4.0 3108 1 A LTE\_SC\_PTM-Core  
R2-1711453  
=> The CR is agreed
- R2-1713664 SFN desynchronizaion between eNB and eDRX UE NTT DOCOMO INC. CR Rel-  
14 36.331 14.4.0 3194 - F LTE\_extDRX-Core  
=> The CR is agreed

### 7.3.1 Other

- R2-1713155 Clarification to WLAN status monitoring Nokia, Nokia Shanghai Bell CR Rel-13  
36.331 13.7.1 3171 - F LTE\_WLAN\_radio-Core  
=> The CR is not pursued
- R2-1713156 Clarification to WLAN status monitoring Nokia, Nokia Shanghai Bell CR Rel-14  
36.331 14.4.0 3172 - F LTE\_WLAN\_radio-Core  
=> The CR is not treated
- R2-1713559 Clarification on csi-RS-ConfigNZPId Qualcomm Incorporated, Ericsson CR Rel-  
13 36.331 13.7.1 3111 1 F LTE\_EBF\_FDMIMO-Core R2-1711467  
=> The CR is revised in R2-1714054
- R2-1714054 Clarification on csi-RS-ConfigNZPId Qualcomm Incorporated, Ericsson CR Rel-  
[CB 524]
- R2-1713564 Clarification on csi-RS-ConfigNZPId Qualcomm Incorporated, Ericsson CR Rel-  
14 36.331 14.4.0 3112 1 A LTE\_EBF\_FDMIMO-Core R2-1711471  
=> The CR is revised in R2-1714055
- R2-1714055 Clarification on csi-RS-ConfigNZPId Qualcomm Incorporated, Ericsson CR Rel-  
[CB 524]
- R2-1713561 Signaling of NCSG Support for Inter-F Measurement Qualcomm Incorporated, Ericsson  
CR Rel-14 36.331 14.4.0 3110 2 B LTE\_meas\_gap\_enh-Core R2-  
1711466 Withdrawn
- R2-1713626 Missing optionality bit in UE capability signalling Ericsson CR Rel-13 36.331  
13.7.1 3191 - F LTE\_CA\_enh\_b5C-Core  
- Nokia thinks that this that this is a non-backward compatible change  
- Intel explains that there is a 12-13% increase  
- Qualcomm doesn't think that we are gaining much as we would just send an empty IE.  
=> The CR is not pursued
- R2-1713627 Missing optionality bit in UE capability signalling Ericsson CR Rel-14 36.331  
14.4.0 3192 - A LTE\_CA\_enh\_b5C-Core  
=> The CR is not treated

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## 8 LTE Rel-14

### 8.1 WI: Enhanced LAA for LTE

(LTE\_eLAA-Core; leading WG: RAN1; REL-14; started: Dec. 15; closed: Mar. 17; WID:RP-162229)

This agenda item is for correction CRs to the closed WI.

*Documents in this agenda item will be handled in a break out session*

## 8.2 WI: Support for V2V services based on LTE sidelink

*(LTE\_SL\_V2V-Core; leading WG: RAN1; started: Dec. 15; closed: Sept 16; WID: RP-161603)*

*Documents in this agenda item will be handled in a break out session*

### 8.2.1 User plane

### 8.2.2 Control plane

### 8.3 Void

### 8.4 Void

## 8.5 WI: Enhanced LTE-WLAN Aggregation (eLWA)

*(LTE\_WLAN\_aggr-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Mar. 17; WID: RP-160923)*

*Documents in this agenda item will be handled in a break out session*

R2-1712954 Correction to RLC UM for LWA Ericsson CR Rel-14 36.323 14.4.0 0210 -  
F TEI14  
=> The CR is agreed

## 8.6 WI: Further mobility enhancements in LTE

*(LTE\_eMob-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Mar. 17; WID:RP-162503)*

*Documents in this agenda item will be handled in a break out session*

## 8.7 WI: Further Indoor Positioning enhancements for UTRA and LTE

*(UTRA\_LTE\_iPos\_enh2-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Dec. 16; WID: RP-162026)*

*Documents in this agenda item will be handled in a break out session*

## 8.8 WI: L2 latency reduction techniques for LTE

*(LTE\_LATRED\_L2-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Sep. 16; WID: RP-160667)*

*Documents in this agenda item will be handled in a break out session*

### 8.9 Void

## 8.10 WI: eMBMS enhancements for LTE

*(MBMS\_LTE\_enh2-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Sep. 17; WID:RP-162231)*

*Documents in this agenda item will be handled in a break out session*

R2-1714120 Reply LS on CR for Reference Signals for MBSFN with 1.25kHz and 7.5kHz sub-carrier spacing (R1-1721431; contact: Intel) RAN1 LS in Rel-14 MBMS\_LTE\_enh2-Core RAN2  
- Intel think a CR is required.  
=> Check whether a CR is available (Qualcomm)  
=> The previous in principle agree CR from previous meeting is incorrect and was not submitted to this meeting. It will corrected and submitted to next meeting

### 8.10.0 In principle agreed CRs

### 8.10.1 Other

## 8.11 WI: Enhancements of NB-IoT

*(NB\_IOTenh-Core; leading WG: RAN1; REL-14; started: June 16; closed: Jun. 17; WID: RP-171060)*

Note: SC-PTM for eNB-IoT is handled under 8.12.1

Documents in this agenda item will be handled in a break out session

LS in

R2-1714202 LS on correction of interference in NB-IoT RACH procedure RAN1 LS in  
 - Crs exists, We treat them by email  
 ⇒ **noted**

### 8.11.0 In principle agreed CRs

R2-1713040 Clarification on Interference Randomisation in NB-IoT in 36.331 Ericsson, Qualcomm  
 Incorporated CR Rel-14 36.331 14.4.0 3090 2 F NB\_IOTenh-Core  
 R2-1711879  
 ⇒ **Agreed**

R2-1713039 Removal of FFS for RAI in 36.321 Ericsson CR Rel-14 36.321 14.4.0 1186 1  
 F NB\_IOTenh-Core R2-1710748  
 ⇒ **Agreed**

### 8.11.1 Other

Including output of email discussion [99bis#33][NB-IoT R14] UE-Capability-NB extension (Sequans)

#### UE capability-NB extension

R2-1713532 Report of [99bis#33][NB-IoT R14] UE-Capability-NB extension Sequans Communications  
 discussion NB\_IOTenh-Core  
 DISCUSSION

- P1: Nokia think that Rel-14 proposal is ok but is not sufficient and we need to do a corresponding change for Rel-13 (change to dummy and not to use). Huawei think we don't need this. Nokia indicate that if we ever want to extend the Rel-13 we anyway need to use the R-14 extension and it will be uglier. Ericsson think there no strict need to update Rel-13. Sequans think the main part for the Rel-13 CR if we agree to it is the latenoncritical extension
- P2: Sequans indicate that the intention is to make indication on 3GPP website. QC support this.
- P4: Huawei and Nokia think we can use the r14 naming as this is anyway the first usable version for Rel-14. Nokia think it may be understood that we then indicate that r13 cannot be used together with r14. Sequans think that if we use R14 naming we can modify the name to ...ext. Sequans wonders if we need to change - ue-CapabilityContainer-r13 into ue-Capability-r13. Nokia think that if we do this, we also need to have a CR to Rel-13.
- P5: QC think we don't need yet latenoncritical extension in Rel 14 as we don't have rel-15 specs yet. Sequans think we didn't do this for rel-13 when we did Rel-14. Huawei think we need this for the handover preparation message. Nokia think we should have this for Rel-13 and for later releases we don't necessarily need it. LG agrees with Nokia. QC think we have sufficient possibility to extend in Rel-13 and don't think this is needed. Nokia proposes to go offline.

- ⇒ **UE-Capability-NB-r13 non-critical extension mechanism shall be deactivated as proposed in [1]**
- ⇒ **Clarify on the cover-sheet that earlier versions of release 14 shall not be used by the UE to signal REL-14 UE capabilities, and there is a non-backwards compatibility. MCC can indicate the issue of non-usable versions on the 3GPP web-site as well.**
- ⇒ **The NOTE is not needed.**
- ⇒ **Include the whole UECapabilityInformation-NB message in UERadioAccessCapabilityInformation-NB-IEs non-critical extension (in a container), from Rel-14.**
- ⇒ **Use r14 style naming.**
- ⇒ **Keep ue-CapabilityContainer-r13**
- ⇒ **On P5, we don't introduce release-14 latenoncritical extension now**

Offline 300, discuss details, on the need for R13 additional extension, arrive at an agreeable CR revision (as below) (sequans).

R2-1713355 Correction to UE-Capability-NB extension Sequans Communications CR Rel-14  
 36.331 14.4.0 3113 2 F NB\_IOTenh-Core R2-1711830  
 ⇒ **Revised, revision in R2-1713959**

R2-1713959 Correction to UE-Capability-NB extension and provision for late rel-13 corrections CR Rel-14  
 36.331 14.4.0 3113 2 F NB\_IOTenh-Core R2-1711830  
 - Nokia think we now have to inform ETSI,  
 - QC and Huawei think we need to update the interoperability statement on the coversheet.  
 ⇒ **No “-“ between Info and Ext**  
 ⇒ **Same Field description for ue-RadioAccessCapabilityInfo-Ext and ue-RadioAccessCapabilityInfo**  
 ⇒ **update the interoperability statement on the coversheet (discuss offline, QC, Huawei)**  
 ⇒ **Chair to include in report that indication on 3GPP website is needed.**  
 ⇒ **Revised in R2-1714000**

R2-1714000 Correction to UE-Capability-NB extension and provision for late rel-13 corrections CR Rel-14  
 36.331 14.4.0 3113 4 F NB\_IOTenh-Core R2-1711830  
 ⇒ **agreed**

R2-1714175 Correction to UE-Capability-NB extension and provision for late rel-13 corrections CR Rel-13  
 36.331 F NB\_IOT-Core  
 ⇒ **agreed**

**Dedicated bearer**

R2-1713038 No dedicated bearer support in NB-IoT Ericsson CR Rel-14 36.300 14.4.0 1075  
 - F NB\_IOTenh-Core  
 - Huawei think that we need no change to R2 this is a purely Core Network issue.  
 - Nokia wonders if this means that we can have only 1 bearer.  
 - Ericsson think we discuss default and dedicated bearers in CH 13, and we should be consistent.  
 - LG think the CR could be ok but could say “dedicated EPS bearer” if clarification is needed.  
 - QC think we don’t need it as it doesn’t impact AS.  
 ⇒ **Not pursued**

**36.321**

R2-1713216 Clarification on carrier index in PDCCH order Huawei, HiSilicon CR Rel-14  
 36.321 14.4.0 1188 2 F NB\_IOTenh-Core R2-1711883  
 - Ericsson clarifies that there is a 36.213 CR that has been agreed in R1 and that fixes this problem.  
 - Huawei think only the last change is now needed and reference to R1 CR to be added to the cover page  
 ⇒ **Revised in R2-1714001**

R2-1714001 Clarification on carrier index in PDCCH order Huawei, HiSilicon CR Rel-14  
 36.321 14.4.0 1188 3 F NB\_IOTenh-Core R2-1711883  
 ⇒ **Update the coversheet, incomplete impact analysis**  
 ⇒ **Revised in R2-1714007, revision agreed unseen.**

**36.331**

R2-1713217 Small corrections for NB-IoT enhancements Huawei, HiSilicon CR Rel-14  
 36.331 14.4.0 3175 - F NB\_IOTenh-Core  
 - LG wonders about the intention to remove nonAnchor. Huawei explains that in Rel14 the eNB can decide to move a UE to and configure the anchor carrier using these IEs.  
 - QC think that we could also just introduce “Anchor / nonAnchor” instead and be more compatible towards the Rel-13 spec. Huawei would be ok with this.  
 - Blackberry think that it would be good to have a better Title.

- Change the title to “Small Corrections to CarrierConfigDedicated, T322 and t-reordering default configuration”
- ⇒ **Change the title to “Small Corrections to CarrierConfigDedicated, T322 and t-reordering default configuration”**
- ⇒ Use “anchor / nonAnchor” instead.

Revision in R2-1713962

R2-1713962 Small corrections to CarrierConfigDedicated, T322 and t-reordering default configuration  
Huawei, HiSilicon CR Rel-14 36.331 14.4.0 3175 1 F NB\_IOTenh-Core  
⇒ **agreed**

### Radio Issues

R2-1713218 Correction of interference in NB-IoT RACH procedure Huawei, HiSilicon CR Rel-14 36.306 14.4.0 1534 - F NB\_IOTenh-Core  
R2-1713219 Correction of interference in NB-IoT RACH procedure Huawei, HiSilicon CR Rel-14 36.321 14.4.0 1199 - F NB\_IOTenh-Core  
R2-1713220 Correction of interference in NB-IoT RACH procedure Huawei, HiSilicon CR Rel-14 36.331 14.4.0 3176 - F NB\_IOTenh-Core

Comeback later wait for R1.

- Huawei indicates that there is an LS from R1
- QC think we should change the title of the CRs and they should be called “introduction of blabla” instead.
- Huawei indicates that two of the CRs above need to be updated acc to R1 agreements.

☒ **[100#13][NB-IoT R14] Interference in RACH procedure, CR approval 1 week (revisions of R2-1713218, 19, 20), update CRs based on R1 LS (Huawei)**  
Deadline: Thursday 2017-12-07

⇒ The CRs are agreed in R2-1714254, R2-1714255, R2-1714256.

R2-1713239 DL and UL CE level non-corresponding issue in NB-IoT CMCC discussion Rel-14  
NB\_IOTenh-Core

- Chair wonders if we cannot configure UL and DL differently for a specific CE level? ZTE think there may be some problems.
- ZTE think there cannot be a CE level for the UL as the UE cannot know the UL interference. LG agrees with ZTE and think this can be handled by the eNB, i.e. to configure more UL repetitions for a high UL interference situation.
- Mediatek wonders is the repetition levels for UL and DL cannot be decoupled. CMCC think this punishes UEs in good coverage.
- QC think that the max number of repetitions is not changed during a connection.
- LG would like to understand whether RSRQ can be useful.
- Nokia think that after the RACH procedure the eNB can do link adaptations. Nokia think that the RACH problem can be resolved by different configuration. CMCC think this is not possible and that the UE would need to do ramping.
- Chair think we need to understand the character of the problem in more detail.
- Ericsson think this is interesting and would like to better understand, but have concerns on some solutions e.g. further RACH resource partitioning.
- Huawei think that this is also related to current R1 discussions, and in several cases it can be resolved by configuration.
- QC wonders if this is a R1 issue. Huawei agrees this is mainly R1. Ericsson agrees and think this shall be discussed with RACH interference disc in R1. LG think that also R4 should be in the loop.
- CMCC think we can have an email discussion.

⇒ **R2 suggest the discussion to continue in R1.**

R2-1713240 Introduction of DL CE level estimation for NB-IoT CMCC CR Rel-14 36.331 14.4.0 3179  
- F NB\_IOTenh-Core

R2-1713241 Introduction of Measurement Report for NB-IoT CMCC discussion Rel-14 NB\_IoTenh-Core

Proposal 1: NB-IoT UE reports the latest serving cell's measurements in MSG3 or MSG5.

Proposal 2 : At least the serving cell's NRSRP is reported. NRS-SINR is also report if available.

Proposal 3 : Measurement reporting threshold is broadcasted in SI or unicast transmitted in MSG4.

#### DISCUSSION

- MTK has sympathy for this but as NB-IoT don't have support for mobility, will the impact be large? Is the RSRP for serving cell enough? CMCC want low impact and think the proposals represents a very small impact that is also useful, e.g. no new requirements for measurements. CMCC think that the UE will anyway always measure RSRP and SINR.
- Ericsson think this is good, but think it can be more related RACH reporting in UMTS than e.g. Measurement reporting in LTE
- LG think that measurements can be reported by the application and think we already agreed to not support measurement reporting in Rel-14 and think it can maybe be a point in Rel-15
- QC think that serving cell measurements are ok from security point of view.
- QC think that interference could indeed be interesting.
- QC think that for e.g. EDT think can maybe not be done, and think we need to consider the size of MSG3.
- Gemalto think that if this is about reporting of available measurements this can be ok.
- Huawei think we have already discussed this.
- CMCC think that the granularity of "CE level" is too coarse information.
- ZTE support that the UE can report serving cell measurements. Blackberry also support.
- Huawei think we at least need to check with SA3. CMCC think we already have CQI reporting without security in all systems so we can do this without SA3 involvement.
- LG wonders whether the signalling would be RRC or physical layer. Chair wonders if there is a principal difference?
- Nokia point out that there is work ongoing on early CA activation where early measurements are needed.

⇒ **There seems to be interest, at least if only a) serving cell measurements and b) "available" measurements are considered.**

✉ **[100#37][NB-IoT R14] Email discussion for next meeting on Measurement Report for NB-IoT, what could be the possible solution(s), which release, pave the way for decisions, (CMCC).**

Intended outcome: Report to next meeting

Deadline: Thursday 2017-02-08

## 8.12 WI: Further Enhanced MTC for LTE

(LTE\_feMTC-Core; leading WG: RAN1; REL-14; started: June 16; closed: Jun. 17; WID: RP-170532)

*Documents in this agenda item will be handled in a break out session*

### LS in

- R2-1712106 Reply LS on Restricted Use of Enhanced Coverage (C1-174627; contact: Nokia) CT1 LS in  
Rel-15 Clot\_Ext To:RAN6, SA2 Cc:RAN2  
⇒ **Noted**
- R2-1712112 LS on Comb 2 SRS enhancements for BL/CE UEs (R1-1719093; contact: Qualcomm) RAN1  
LS in Rel-14 LTE\_feMTC-Core To:RAN2  
⇒ **Take into account**  
⇒ **Noted**
- R2-1712153 Data support for "voice centric" UE supporting CE mode B (S2-178179; contact: Intel) SA2  
LS in Rel-14 Clot\_Ext To:RAN2, RAN3  
⇒ **Take into account**  
⇒ **Noted**

### 8.12.0 In principle agreed CRs

- R2-1712290 Target cell optional PBCH repetition status indication Qualcomm Incorporated CR Rel-14  
36.331 14.4.0 3037 3 F LTE\_feMTC-Core R2-1711889  
- Ericsson point out that there are several spelling errors on the cover page, and think the interoperability text can be somewhat enhanced  
- Huawei think that the (revision of R2-xxxx) notation is not for CRs and should be removed. QC think that Juha has checked this and is ok. QC to decide if to keep or remove.  
⇒ **Revision in R2-1713978, which is agreed unseen**
- R2-1713096 Correction on downlink reception type combination for SC-PTM in feMTC Huawei, HiSilicon  
CR Rel-14 36.302 14.3.0 0115 2 F LTE\_feMTC-Core R2-1711884  
- Ericsson think now that the change is wrong  
Offline discussion (304) Huawei.  
⇒ **revised**
- R2-1713991 Correction on downlink reception type combination for SC-PTM in feMTC Huawei, HiSilicon  
CR Rel-14 36.302 14.3.0 0115 3 F LTE\_feMTC-Core R2-1711884  
⇒ **agreed**
- R2-1713098 Correction on TS 36.300 for support of larger maximum PDSCH/PUSCH channel bandwidth for feMTC Huawei, HiSilicon CR Rel-14 36.300 14.4.0 1066 1 F  
LTE\_feMTC-Core R2-1711227  
⇒ **agreed**
- R2-1713225 Minor correction on the IE of pusch-EnhancementsConfig in feMTC Huawei, HiSilicon  
CR Rel-14 36.321 14.4.0 1187 1 F LTE\_feMTC-Core R2-1711225  
⇒ **agreed**

#### Withdrawn

- R2-1713097 Minor correction on the IE of pusch-EnhancementsConfig in feMTC Huawei, HiSilicon  
CR Rel-14 36.302 14.3.0 1187 1 F LTE\_feMTC-Core R2-1711225

### 8.12.1 Multicast for feMTC and eNB-IoT

### 8.12.2 Other

#### SRS enhancement



R2-1712235 UE capability for support of SRS enhancements without support of comb 4 Qualcomm Incorporated, Ericsson CR Rel-14 36.331 14.4.0 3127 - F LTE\_feMTC-Core  
 ⇒ **agreed**

R2-1712236 UE capability for support of SRS enhancements without support of comb 4 Qualcomm Incorporated, Ericsson CR Rel-14 36.306 14.4.0 1514 - F LTE\_feMTC-Core  
 - Huawei wonders if they are mutually exclusive. QC confirms that this is the case.  
 ⇒ **agreed**

**Dynamic Change of CE mode B Restriction**

R2-1712638 Discussion on CE mode B restriction change in RRC connected mode Intel Corporation discussion Rel-14 LTE\_feMTC-Core  
 - Proposal: RAN2 agree to provide feedback to SA2 in a reply LS that there is no issue in updating the CE mode B restriction parameter at eNB by MME in RRC connected mode.  
 - QC think there may be R2 TS impact for Idle mode. LG think there is no impact at UE side. In Idle mode and Scriterion is enough. Intel think we can focus on connected mode as the question is about connected mode.  
 - Ericsson wonders what is exactly the scenario for the change in connected mode.  
 - Nokia wonders if the AS capability is dependent on data / voice centric setting. Intel think this is independent.  
 - It seems agreeable that "R2 has found no issue in updating the CE mode B restriction parameter at eNB by MME in RRC connected mode." But there is confusion as to how the feature is supposed to work and concerns expressed that there may be an impact in Idle.

Offline discussion (305) (Intel) to address concerns and arrive at an agreeable LS. Companies that have concerns are required to clarify their concerns.

⇒ **noted**

R2-1712637 [DRAFT] Reply LS on Data support for "voice centric" UE supporting CE mode B Intel Corporation LS out Rel-14 LTE\_feMTC-Core To:SA2  
 ⇒ **revised**

R2-1713995 [DRAFT] Reply LS on Data support for "voice centric" UE supporting CE mode B Intel Corporation LS out Rel-14 LTE\_feMTC-Core To:SA2  
 - Ericsson think that companies should review the whole mechanism, i.e. NAS + AS, for both connected and Idle to ensure that there are no problems. QC agrees that we need to check this also in connected mode. Gemalto agrees. Intel think that for connected mode there is no problem, just eNB implementation.  
 - Huawei think we can wait.  
 - Chair think that this can be discussed next meeting based on contributions.  
 - Chair: So far we have not found any issues for connected mode, but it seems that some companies want more time to check and understand.  
 ⇒ **postponed**

**36.321**

R2-1712938 Correction on mac-ContentionResolutionTimer for FeMTC and eNB-IoT Nokia, Nokia Shanghai Bell CR Rel-14 36.321 14.4.0 1194 - F LTE\_feMTC-Core, NB\_IOTenh-Core  
 - LG think there is still a problem. What happens if the PDU is not successfully decoded.  
 - Intel think that extending the timer is preferable to making this change.  
 - Nokia think that the transmission procedure is now changed compared to LTE, as PDCCH and PDSCH is transmitted one after the other, and this motivates the change of behaviour.  
 - The current CR anyway need update to cover the case of non-correctly decoded MAC PDU.  
 - 3 options  
     a) Do Nothing, 1  
     b) increase the timer, 2  
     c) change the scope of the timer to cover the time of the PDCCH 5

Work offline (306) to find an agreeable CR taking into the case of non-correctly decoded MAC PDU (Nokia),

⇒ **Revision in R2-1713979**

- R2-1713979 Correction on mac-ContentionResolutionTimer for FeMTC and eNB-IoT Nokia, Nokia Shanghai Bell CR Rel-14 36.321 14.4.0 1194 - F LTE\_feMTC-Core, NB\_IOTenh-Core
- LG agrees with the intention of the CR but think this can be resolved in a more compact way.
  - QC agrees
  - QC point out that the Styles used in the CR seems wrong.
- ⇒ **Agree to do the change as functionally done in the CR, but can consider changes to make the CR more compact**

☒ **[100#14][NB-IoT/MTC R14] CR approval One Week, Contention Resolution Timer (Nokia).**

Deadline: Thursday 2017-12-07

⇒ The CR is agreed in R2-1714264.

### 36.331

- R2-1712939 Correction on FGI bit-13 for FeMTC Nokia, Nokia Shanghai Bell CR Rel-14 36.331 14.4.0 3150 - F LTE\_feMTC-Core
- Ericsson think we should not do this change. This would be a RP decision.
  - Chair understands that with the current text Rel14 Cat M1 M2 UE can indicate Yes or No for this FGI, and if we do the proposed change it means that Cat M1 M2 UEs are no longer allowed to indicate non-support for Rel-14.
- ⇒ **Not Pursued**
- R2-1713104 Correction on the field description of ce-PDSCH-TenProcesses Huawei, HiSilicon CR Rel-14 36.331 14.4.0 3169 - F LTE\_feMTC-Core
- Should tick the RAN box
- ⇒ **Revision in R2-1713980, which is agreed unseen.**
- R2-1712632 Clarification on srs-UpPtsAdd in SRS coverage enhancement Intel Corporation CR Rel-14 36.331 14.4.0 3137 - F LTE\_feMTC-Core
- Impact analysis should be moved to summary of change.
  - QC think that the Interoperability statement should be updated. Intel think this is not needed, as also today without the change, the network should not configure different values as this is not reasonable.
- ⇒ **Revision in R2-1713981, move the impact analysis, which is agreed unseen.**
- R2-1712633 Scheduling information of SIB1-BR when skipping MIB during HO Intel Corporation CR Rel-14 36.331 14.4.0 3138 - F LTE\_feMTC-Core
- QC are ok with the CR but wonders why there is a new CR number (the previous CR in R2-1711893 was postponed)
  - Huawei think that the text in the Field description should be changes to .."If absent when *sameSFN-Indication* is present, UE assumes that *SystemInformationBlockType1-BR* scheduling information in target cell may be different from source cell". (change is to may be).
  - OQ point out that the interoperability statement should be in the summary of change.
  - Nokia wonders what is the impact if this is not provided.
- ⇒ **Field description should be changed to .."If absent when *sameSFN-Indication* is present, UE assumes that *SystemInformationBlockType1-BR* scheduling information in target cell may be different from source cell". (change is to may be).**
- ⇒ **interoperability statement should be in the summary of change**
- ⇒ **Revision in R2-1713982, with above changes, revision agreed unseen**
- R2-1712470 Correction to actions related to InterFreqRSTDMeasurementIndication message Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3135 - F LTE\_feMTC-Core

- Huawei think that the consequences if not approved is not consistent with the impact analysis, and think that TEI14 should be added to the WI code.
- ⇒ **Remove the text on the coversheet saying this is a typo, keep text saying it is an error.**
- ⇒ **Add TEI14 to the WI code**
- ⇒ **Revised in R2-1713983, agreed unseen**

### 36.355

- R2-1713099 Correction on PRS hopping configuration Huawei, HiSilicon CR Rel-14 36.355  
 14.3.0 0187 1 F LTE\_feMTC-Core R2-1711229
- In the impact analysis, include the word "Rel-14" when indicating the non-usable versions of specifications, use capitals when writing ASN.1
  - ⇒ **Revision in R2-1713984, which is agreed unseen.**

## 8.13 WI: LTE-based V2X Services

*(LTE\_V2X-Core, leading WG: RAN1; REL-14; started: June 16; closed: Mar. 17; WID: RP-162519)  
 Documents in this agenda item will be handled in a break out session*

### 8.13.0 In principle agreed CRs

- R2-1712192 CR on SIB21 reading OPPO, Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3073  
 3 F LTE\_V2X-Core R2-1711860  
 => the CR is agreed
- R2-1712558 Correction on SubframeBitmap Configuration in Band 47 Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3085 2 F LTE\_V2X-Core R2-1711848  
 => the CR is agreed
- R2-1712741 Corrections to V2X in TS 36.300 Huawei, HiSilicon CR Rel-14 36.300 14.4.0 1062  
 3 F LTE\_V2X-Core R2-1711859  
 => The CR is agreed
- R2-1713413 Correction to UE capabilities Nokia, Nokia Shanghai Bell CR Rel-14 36.331  
 14.4.0 3107 2 F LTE\_V2X-Core R2-1711854  
 => The CR is agreed

### 8.13.1 Stage 2

- R2-1712742 Correction to V2X descriptions in TS 36.302 Huawei, HiSilicon CR Rel-14  
 36.302 14.3.0 0114 1 F LTE\_V2X-Core R2-1710099  
 => The CR is revised R2-1714051
- R2-1714051 Correction to V2X descriptions in TS 36.302 Huawei, HiSilicon CR Rel-14  
 36.302 14.3.0 0114 1 F LTE\_V2X-Core R2-1710099  
 => The CR is agreed
- R2-1713509 Clarification to Mapping Between Service Types and V2X Frequencies Ericsson CR  
 Rel-14 36.300 14.4.0 1083 - F LTE\_V2X-Core  
 => The CR is revised in R2-1714053
- R2-1714053 Clarification to Mapping Between Service Types and V2X Frequencies Ericsson CR  
 R2-1713509 Rel-14 36.300 14.4.0 LTE\_V2X-Core  
 => The CR is agreed
- R2-1713510 Clarification to Mapping Between Service Types and V2X Frequencies Ericsson  
 discussion Rel-14 LTE\_V2X-Core  
 => Not treated

### 8.13.2 User plane

- Including output of email discussion [99bis#46][LTE/V2X] CR to 36.321 - LG*
- R2-1713817 Corrections to V2X functionality LG Electronics Inc. CR Rel-14 36.321 14.4.0 1190  
 2 F LTE\_V2X-Core R2-1711852  
 => the CR is agreed

### 8.13.3 Control plane

R2-1712622 Clarifications on V2X SL communications Intel Corporation discussion Rel-14  
LTE\_V2X-Core

=> The CR is revised in R2-1714011

R2-1714011 Clarifications on V2X SL communications Intel Corporation discussion Rel-14  
LTE\_V2X-Core

=> Noted

*[Proposal1]: RAN2 is asked to discuss and confirm total number of SL processes for V2X transmissions is "8"*

- LG confirms
- Nokia thinks that 2 were sufficient for Rel-14 and 2 were decided during WI phase. Intel thought that 2 were for booking processes but we may have one-shot transmission as well.
- Ericsson thinks that we should clarify booking process applies to all cases.
- Ericsson doesn't see why we should change the 2.
- LG explains that the UE has to support up to 8 SL SPS so to support this we would need at least 8 HARQ process

*[Proposal3]: RAN2 is asked to discuss and confirm how to select TX resource pool when UE's positioning information is not available and zone specific TX resource pool is configured for the concerned frequency:*

*Option1: Select the first TX resource pool*

*Option2: Select the exceptional TX resource pool*

- Qualcomm ask if the UE doesn't have positioning information why is it sending information
- Intel explains that there are regulatory requirements/test that the UE should transmit within a few second after powering up and at that point the UE may not have positions info.
- Qualcomm thinks that we can leave it up to UE implementation as it is a temporary situation.
- Ericsson thinks that the UE should just fallback to use the normal pool
- Huawei thinks UE implementation is sufficient. LG thinks this is a very rare case and there is no need to specify anything.

#### Agreements

- 1 We will support up to 8 SL processes (e.g. HARQ) for V2X transmission
- 2 Clarify in MAC that the restriction of 2 SL booking processes per carrier is applicable for transmission of multiple MAC PDUs (e.g. not just with sensing)
- 3 It is up to UE implementation which resource within allowed pools to select in case positioning information is not available. We will add a NOTE in 36.331.
- 4 CR will be prepared for next meeting

R2-1712740 Correction to Inter-frequency reception for V2X sidelink communication Huawei, HiSilicon  
CR Rel-14 36.331 14.4.0 3072 1 F LTE\_V2X-Core R2-1710100

=> check the ME and RAN box

- Intel asks if we can configure v2x-InterFreqInfoList in the handover case outside the mobilityInfo IE

=> The v2x-InterFreqInfoList will not be included in dedicated signalling except in the handover command

=> The CR is revised in R2-1714039

R2-1714039 Correction to Inter-frequency reception for V2X sidelink communication Huawei, HiSilicon CR  
Approval R2-1710100, R2-1712740 Rel-14 36.331 14.4.0 LTE\_V2X-  
Core 3072 2 F

=> Add: This field is absent within v2x-InterFreqInfoList included in  
*RRCConnectionReconfiguration* except if received with *MobilityControlInfo* or  
*MobilityControlInfoV2X*.

=> The CR is agreed in R2-1714064

R2-1713377 Correction on zone configuration in transmission pool selection Qualcomm Incorporated CR  
Rel-14 36.331 14.4.0 3184 - F LTE\_V2X-Core

- Spirent asks if it is ok that that zones are strangely shaped. Qualcomm doesn't see a problem with that. Companies think that as long as there is a uniform UE behaviour there should be no problem.

- Qualcomm explains that we should use a predictable model, the one use by 3GPP, WGS84. Spirent agrees and indicates that this is only for zone calculations.
- Huawei would like to have some more time to check

☒ **[100#03][LTE/V2X] – agree to CR – Qualcomm**

- confirm the earth model used, WGS84
  - agree to CR
  - one week after the meeting
- => The CR is agreed in R2-1713377.

R2-1713384 Transmission of P2X sidelink communication in Exceptional Pool Qualcomm Incorporated  
 Rel-14 36.331 14.4.0 3084 1 F LTE\_V2X-Core R2-1710686

- Intel is ok with the intention but there are duplication and some bullets can be combined
  - Nokia thinks we should update the coverage to reference an agreement
- => The CR is updated in R2-1714035

R2-1714035 Transmission of P2X sidelink communication in Exceptional Pool Qualcomm Incorporated  
 49530 CR Agreement R2-1710686, Rel-14 36.331 14.4.0 LTE\_V2X-  
 Core 3084 1 F

- => change “transmit” to “perform” in all the instances
- => The CR is agreed in R2-1714065

R2-1713385 UE behavior for using provisioned ITS carrier Qualcomm Incorporated  
 LTE\_V2X-Core R2-1710688 discussion

*Proposal 1: The UE shall be allowed to use pre-configuration for V2X sidelink communication in non-operator-controlled frequency (e.g., ITS carrier) if no normal resource on that carrier is provided in SIB21 nor in dedicated signalling by the serving eNB, even though the carrier frequency is included in v2x-InterFreqInfoList within SIB21 by the cell.*

*Proposal 2: it is left to UE implementation how UE evaluate whether TX resource in provisioned carrier is provided or not by the serving eNB.*

*Proposal 3: RAN2 to agree the change in subclause 5.10.13.1 as shown in the associated CR in R2-1710689.*

- Intel agrees with intention
  - Oppo and Ericsson don't think this is a valid scenario and SA2 already covered this scenario. Huawei agrees.
  - Samsung agrees with Intel. Huawei thinks we can trust the network. The network can just deconfigure carrier frequency in SIB21 if it can't provide resources for the UE.
- => Noted

R2-1713386 Correction on transmission of V2X sidelink communication in provisioned frequency  
 Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3086 1 F LTE\_V2X-  
 Core R2-1710689

R2-1713825 SLSS resource configuration LG Electronics Inc. discussion Rel-14  
 LTE\_V2X-  
 Core

- => RAN2 acknowledges that there may be a problem and there is a strong preference to try to solve this in RAN1 without ASN.1 impact
- => Noted

R2-1713826 Correction to SLSS resource configuration LG Electronics Inc. discussion Rel-14  
 36.331 LTE\_V2X-Core Withdrawn

R2-1713835 Correction to SLSS resource configuration LG Electronics Inc. CR Rel-14 36.331  
 14.4.0 3200 - F LTE\_V2X-Core

- => Not treated

## 8.14 WI: SRS switching between LTE component carriers

(LTE\_SRS\_switch; leading WG: RAN1; REL-14; started: Mar.16; closed: Dec. 16; WID: RP-160935)

*Documents in this agenda item will be handled in a break out session*

## 8.14.0 In principle agreed CRs

R2-1712327 Correction on SRS switching capabilities field description Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3088 1 F LTE\_SRS\_switch R2-1710891  
=> The CR is agreed

## 8.14.1 Other

## 8.15 WI: Measurement Gap Enhancement for LTE

*(LTE\_meas\_gap\_enh-Core; leading WG: RAN4; REL-14; started: Mar. 16; closed: Jun. 17; WID: RP-160912)*

R2-1713541 Signaling of NCSG Support for Inter-F Measurement Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3110 1 B LTE\_meas\_gap\_enh-Core R2-1711466  
Withdrawn

R2-1713566 Signaling of NCSG Support for Inter-F Measurement Qualcomm Incorporated, Ericsson, Nokia CR Rel-14 36.331 14.4.0 3110 3 B LTE\_meas\_gap\_enh-Core R2-1711466  
=> The CR is agreed

## 8.16 Void

## 8.17 WI: Performance enhancements for high speed scenario in LTE

*(LTE\_high\_speed-Core; leading WG: RAN4; REL-14; started: Dec. 15. 16; closed: Dec. 16; WID: RP-160172)*  
*Documents in this agenda item will be handled in a break out session*

## 8.18 WI: Voice and Video enhancement for LTE

*(LTE\_VoLTE\_ViLTE\_enh; leading WG: RAN2; REL-14; started: Sep. 16; closed: Mar. 17; WID: RP-161856)*  
*Documents in this agenda item will be handled in a break out session*

R2-1713875 Clarification on averaging window for RAN assisted codec rate adaptation Qualcomm Incorporated CR Rel-14 36.321 14.4.0 1202 - F LTE\_VoLTE\_ViLTE\_enh  
=> Add reference  
=> Remove the last sentence  
=> Correct the typo  
=> With these changes, the CR is agreed in R2-1714177.

## 8.19 New UE category with single receiver based on Category 1 for LTE

*(LTE\_UE\_cat\_1Rx-Core; leading WG: RAN4; REL-14; started: Sep. 16; closed: Jun. 17; WID: RP-171149)*  
*Documents in this agenda item will be handled in a break out session*

## 8.20 Uplink Capacity Enhancements for LTE

*(LTE\_UL\_CAP\_enh-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Mar. 17; WID: RP-162488)*  
*Documents in this agenda item will be handled in a break out session*

R2-1712119 LS on higher layer signalling for special subframe configuration 10 (R1-1719204; contact: CMCC) RAN1 LS in Rel-14 LTE\_UL\_CAP\_enh-Core To:RAN2  
=> Noted

R2-1713242 Introduction of a new UE capability for ssp10 with less CRS CMCC CR Rel-14 36.306 14.4.0 1536 - B LTE\_UL\_CAP\_enh-Core  
=> The CR is revised in R2-1714040

R2-1714040	Introduction of a new UE capability for ssp10 with less CRS Rel-14 36.306 14.4.0 LTE_UL_CAP_enh-Core	CR 1536 1	R2-1713242 B
	[CB]		
R2-1713243	Introduction of a new configuration for ssp10 with less CRS 36.331 14.4.0 3180 - B LTE_UL_CAP_enh-Core	CMCC CR	Rel-14
	- Qualcomm thinks that TDD-Config-v14xy should be one bit only. => Change the TDD-Config-v14xy to be a single one bit IE and fix where we put the optional capabilities => The CR is revised in R2-1714041		
R2-1714041	Introduction of a new configuration for ssp10 with less CRS Rel-14 36.331 14.4.0 LTE_UL_CAP_enh-Core	CR 3180 1	R2-1713243 B
	[CB 502]		

## 8.21 WI: Enhancements on Full-Dimension (FD) MIMO for LTE

(LTE\_eFD\_MIMO-Core; leading WG: RAN1; REL-14; started: Mar. 2016; closed: Mar. 17: WID: RP-160623)  
Documents in this agenda item will be handled in a break out session

## 8.22 Void

## 8.23 WI: Downlink Multiuser Superposition Transmission for LTE

(LTE\_MUST-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Dec. 16: WID: RP-161019)  
Documents in this agenda item will be handled in a break out session

R2-1713081	MUST capability MediaTek Inc. CR LTE_MUST-Core R2-1710986	Rel-14 36.331 14.4.0 3091 1	F
	=> The CR is agreed		
R2-1713128	MUST capability MediaTek Inc. CR LTE_MUST-Core	Rel-14 36.306 14.4.0 1533 -	F
	=> The CR is agreed		

## 8.24 Other LTE Rel-14 WIs

This agenda item may be used for documents relating to Rel-14 WIs with no allocated RAN2 time but which might have minor RAN2 impact.

Including any LTE corrections related to the following joint UMTS/LTE WI:

(eDECOR-UTRA\_LTE-Core; leading WG: RAN3; REL-14; started: Dec. 16; closed: Mar. 17: WID: RP-162543)

Documents in this agenda item will be handled in a break out session

R2-1712644	Introduction of Enhanced CRS and SU-MIMO Interference Mitigation Performance Requirements for LTE Intel Corporation CR Withdrawn	Rel-14 36.331 14.4.0 3141 -	B TEI14
R2-1712645	Introduction of Enhanced CRS and SU-MIMO Interference Mitigation Performance Requirements for LTE Intel Corporation CR LTE_eCRSIM_eSUMIMO	Rel-14 36.306 14.4.0 1518 -	B
	=> Add receive "antenna" port => Add reference to 36.101 in 4.3.4.49a => The CR is agreed with the changes above in R2-1714042		

### 8.24.0 In principle agreed CRs

R2-1713453	UE capability, retrieval of fallback combinations Samsung Telecommunications CR 14 36.331 14.4.0 3117 1 F LTE_CA_enh_b5C-Core, TEI14	R2-1711512
	- Nokia thinks this is not needed and there is text before that already covers this issue => the CR is not pursued	

## 8.25 LTE TEI14 enhancements

Small Technical Enhancements affecting LTE Rel-14 that do not belong to any Rel-14 WI.

*Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!*

*This agenda item is for items already discussed under TEI14. New proposals should be submitted to TEI15, AI 9.19.*

## 8.25.0 In principle agreed CRs

### Overheating

R2-1712555 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.300 14.4.0 1048 6 B TEI14 R2-1712039

*moved from 8.25.1 to 8.25.0*

=> Revised in R2-1714009 (Offline discussion #03)

R2-1714009 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.300 14.4.0 1048 7 B TEI14

=> Agreed

R2-1712556 Introduction of the UE capability for overheating indication Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell CR Rel-14 36.306 14.4.0 1490 5 B TEI14 R2-1711878

*moved from 8.25.1 to 8.25.0*

=> Agreed

R2-1712557 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom CR Rel-14 36.331 14.4.0 2982 7 B TEI14 R2-1712053

*moved from 8.25.1 to 8.25.0*

=> Minor wording issues to be corrected

=> UE capability to be added

=> Revised in R2-1714010 (Offline discussion #03)

R2-1714010 Introduction of the overheating indication Huawei Device, Huawei, HiSilicon, ICom CR Rel-14 36.331 14.4.0 2982 8 B TEI14

=> Agreed

### Other

*Documents under this 'Other' sub heading will be handled in a break out session*

R2-1713489 Restructuring of CQI-ReportConfig (email discussion 99#21) Nokia, Nokia Shanghai Bell CR Rel-14 36.331 14.4.0 2968 4 F TEI14 R2-1711930

=> The CR is agreed

R2-1713578 Introduction of DL 2Gbps Category Qualcomm Incorporated CR Rel-14 36.331 14.4.0 3071 3 B TEI14 R2-1710246

=> The CR is technically endorsed

R2-1713587 Introduction of DL 2Gbps Category Qualcomm Incorporated CR Rel-14 36.306 14.4.0 1508 2 B TEI14 R2-1710247

=> UL 15 with DL 20 category has been removed from this version of the CR

=> The CR is technically endorsed

R2-1713712 Deliver stored PDCP SDUs for LWA bearer with RLC UM at PDCP re-establishment LG Electronics France CR Rel-15 36.323 14.4.0 0216 - F

LTE\_WLAN\_aggr-Core

=> The CR is agreed

### Withdrawn

R2-1713157 Restructuring of CQI-ReportConfig (email discussion 99#21) Nokia, Nokia Shanghai Bell CR Rel-14 36.331 14.4.0 3173 - F TEI14 Withdrawn

## 8.25.1 Other

### Overheating

R2-1712399 Stage 2 text for UE overheating Ericsson, Deutsche Telekom discussion Rel-14 TEI14



- Intel think the proposal is quite similar to what was previously not agreed. Ericsson confirm it is the same as that previously proposed, and think it is not clear from the stage 3
  - Vodafone would like this statement in the stage 2. It is the UE responsibility to avoid harm to the customer. The network provides the option for the UE to avoid just switching off.
  - Intel think the UE will trigger this indication when there is nothing the UE can do without network action, but if there is no support of the feature in the network at all then the UE must handle it itself.
  - LG think the UE may be prepared to resolve the problem itself but reluctant to mention this in the stage 2.
  - MediaTek think this sentence is not in the scope of 3GPP. OPPO share the view of LG and MediaTek.
  - DT thinks everyone understands that ultimately the UE has to resolve it itself if the network does not do it
  - Qualcomm think the problem is that we referred to overheating and this is causing the problem.
- => Keep the first sentence reworded to say "UE is not dependent on specific network response when indicating overheating problems". Further detail wording can be discussed offline.
- => To be included in revision of the 36.300 CR.

*Other*

*Documents under this 'Other' sub heading will be handled in a break out session*

- R2-1712349 MIMO spatial multiplexing continuity Nokia, Nokia Shanghai Bell CR Rel-14  
 36.331 14.4.0 3130 - F TEI10  
 - Qualcomm thinks that the benefits are limited. Nokia indicates that there are operator papers that show that there is a problem.  
 - Ericsson thinks that we would need a UE capability and then it is getting complex for something that may not be too useful.  
 => The CR is not pursued
- R2-1713020 Segmentation of LPP messages Qualcomm Incorporated discussion  
 - Nokia asks if we can change the procedural part. Qualcomm explains that it would be non-backward compatible so we would need a new IT.  
 - Nokia would like more time to understand the use cases and maybe see if we can do this as part of another WI. Qualcomm explains that this is independent of the positioning method.  
 => Noted
- R2-1713021 Segmentation of LPP Messages Qualcomm Incorporated CR Rel-14 36.355 14.3.0 0189  
 - F TEI14  
 => Not treated
- R2-1712400 Bandwidths in fallback band combinations Ericsson discussion Rel-14 TEI14  
 - Nokia supports the proposal  
 - Qualcomm thinks that Option 2 defeats the purpose. Intel also prefers to stick to option 1. Nokia thinks that with Option 1 now the eNB has to request the UE about capability and the signalling will end up being increased.  
 => Noted
- R2-1712401 Supported bandwidths in Fallback band combination Ericsson CR Rel-14  
 36.306 14.4.0 1515 - F TEI14  
 => Not treated
- R2-1713246 Addition of missing figure for R-PDCCH Ericsson India Private Limited CR Rel-10  
 36.300 10.12.0 1077 - F TEI10  
 => Not treated
- R2-1713249 Addition of missing figures for R-PDCCH and EPDCCH Ericsson India Private Limited CR  
 Rel-11 36.300 11.14.0 1078 - F TEI11  
 => Not treated

- R2-1713252 Addition of missing figures for R-PDCCH and EPDCCH Ericsson India Private Limited CR  
 Rel-12 36.300 12.10.0 1079 - A TEI12  
 => Not treated
- R2-1713254 Addition of missing figures for R-PDCCH, EPDCCH and MPDCCH Ericsson India Private Limited  
 CR Rel-13 36.300 13.9.0 1080 - F TEI13  
 => Not treated
- R2-1713261 Addition of missing figures for R-PDCCH, EPDCCH and MPDCCH Ericsson India Private Limited  
 CR Rel-14 36.300 14.4.0 1081 - A TEI14  
 => The CR is postponed and will be implemented for Rel-15 specs only
- R2-1713492 Correction of the remarks for DL reception type of Sidelink and FeMBMS Ericsson CR  
 Rel-14 36.302 14.3.0 1188 - F TEI14  
 => The changes of this CR will be combined with R2-1713551  
 => The CR is not pursued
- R2-1713717 Reduce LTE UECapabilityInformation signaling size Qualcomm Korea discussion  
 Rel-14  
 - Nokia is concerned that this would introduce some complexity related to storing the capabilities  
 => Noted
- R2-1713718 Reduction of LTE UECapabilityInformation signaling size Qualcomm Korea CR Rel-14  
 36.331 14.4.0 3197 - C TEI14  
 => Not treated

## 9 LTE Rel-15

### 9.1 SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

*(FS\_feD2D\_IoT\_relay\_wearable; leading WG: RAN2; REL-15; started: Mar. 16; target: Dec. 17; SID: RP-170295)  
 Time budget: 0.5TU*

*Documents in this agenda item will be handled in a break out session*

- R2-1712148 LS on FS\_REAR SI conclusion (S2-177943; contact: Huawei) SA2 LS in Rel-15  
 FS\_REAR To:RAN, RAN1, RAN2, RAN3, SA3, CT1, SA3-LI  
 => RAN2 considers that it has addressed SA2 concerns/key issues and doesn't expect any additional issues to be discussed for this SI  
 => Noted

#### 9.1.0 In principle agreed CRs

- R2-1712553 Clarification that bearers are distinguished by LCID on PC5 Huawei, HiSilicon CR  
 Rel-15 36.746 15.0.0 0001 1 F FS\_feD2D\_IoT\_relay\_wearable R2-1710547  
 => The CR is not pursued.
- R2-1713576 Introduction of DL 2Gbps Category Qualcomm Incorporated CR Rel-14 36.331  
 14.4.0 3071 2 B TEI14 R2-1710246 Withdrawn

#### 9.1.1 Other

- R2-1712184 Discussion on target scenarios for 1PRB bandwidth limited UE OPPO discussion Rel-15  
 FS\_feD2D\_IoT\_relay\_wearable  
 => Capture in the TR: RAN2 did not evaluate RAN2 related impacts of 1PRB bandwidth limited UE
- R2-1712185 Discussion on path switch options OPPO discussion Rel-15  
 FS\_feD2D\_IoT\_relay\_wearable

- Intel asks if we should look at the options separately for different cases or have one aligned behaviour. Oppo sees benefits of Option 2 from indirect to direct and we should wait to de-select it.
- => Downscoping of Option 2 may take place during the WI phase
- => Noted

- R2-1712631 Discussion on path switching option 2 Intel Corporation discussion Rel-15  
 FS\_feD2D\_loT\_relay\_wearable  
 Proposal: Option 2 for path switching is considered to be aligned with SA2 assumptions on service continuity  
 => Noted
- R2-1712884 Feasibility evaluation on path switch option 2 LG Electronics Inc. discussion Rel-15  
 FS\_feD2D\_loT\_relay\_wearable  
 => Noted
- R2-1713411 UE initiated path switch Nokia, Nokia Shanghai Bell discussion Rel-15  
 FS\_feD2D\_loT\_relay\_wearable  
 => Noted
- R2-1712554 Signalling for association of PC5 radio resources Huawei, HiSilicon discussion Rel-15  
 FS\_feD2D\_loT\_relay\_wearable  
 => Noted

## 9.2 WI: Shortened TTI and processing time for LTE

*(LTE\_sTTIandPT-core; leading WG: RAN1; REL-15; started: June 16; target: Dec. 17; WID: RP-171468)  
 Time budget: 0.5 TU*

*Documents in this agenda item will be handled in a break out session*

*Including output of email discussion [99bis#47][LTE/sTTI] CR to 36.300 – Ericsson  
 Including output of email discussion [99bis#48][LTE/sTTI] CR to 36.321 – Ericsson  
 Including output of email discussion [99bis#49][LTE/sTTI] CR to 36.331 – Ericsson  
 Including output of email discussion [99bis#50][LTE/sTTI] CR to 36.302 – Ericsson  
 Including output of email discussion [99bis#51][LTE/sTTI] CR to 36.306 – Ericsson  
 Including output of email discussion [99bis#52][LTE/sTTI] – Remaining open issues on sTTI – Ericsson*

- R2-1712116 LS reply on SPS for short TTI (R1-1719154; contact: Huawei) RAN1 LS in Rel-15  
 LTE\_sTTIandPT To:RAN2  
 => Noted
- R2-1712120 LS on updates to TS36.300 for short TTI and short processing time (R1-1719205; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2  
 => the TP will be included in the running CR
- R2-1712138 Reply LS on UE capability signalling for sTTI configurations (R4-1711726; contact: Ericsson) RAN4 LS in Rel-15 LTE\_sTTIandPT To:RAN1 Cc:RAN2  
 => Noted
- R2-1713928 Reply LS on short processing time and short TTI (R1-1719223; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2  
 => Noted
- R2-1713929 LS on RRC parameters for WI on shortened TTI and processing time for LTE (R1-1719231; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2  
 => Noted
- R2-1713930 LS on maximum TA and processing time for LTE shortened processing time and short TTI (R1-1719238; contact: Nokia) RAN1 LS in Rel-15 LTE\_sTTIandPT To:RAN2, RAN4  
 => Noted

- R2-1713931 LS reply on SPS for short TTI (R1-1719248; contact: Huawei) RAN1 LS in Rel-15  
 LTE\_sTTIandPT To:RAN2  
 => Noted
- R2-1712449 Running CR for introduction of shortened TTI and processing time for LTE Ericsson  
 draftCR Rel-15 36.300 14.4.0 B LTE\_sTTIandPT  
 => The CR is endorsed
- R2-1712450 Running CR for introduction of shortened TTI and processing time for LTE Ericsson  
 draftCR Rel-15 36.302 14.3.0 B LTE\_sTTIandPT  
 => The CR is endorsed
- R2-1712451 Running CR for introduction of shortened TTI and processing time for LTE Ericsson  
 draftCR Rel-15 36.306 14.4.0 B LTE\_sTTIandPT  
 => The CR is endorsed
- R2-1712452 Running CR for introduction of shortened TTI and processing time for LTE Ericsson  
 draftCR Rel-15 36.321 14.4.0 B LTE\_sTTIandPT  
 => The CR is endorsed
- R2-1712453 Running CR for introduction of shortened TTI and processing time for LTE Ericsson  
 draftCR Rel-15 36.331 14.4.0 B LTE\_sTTIandPT  
 - Nokia asks if the short processing should be per MAC entity or per cell. Ericsson explains it is per cell as per RAN1 agreement  
 => The CR is endorsed
- R2-1712445 Summary of e-mail discussion on remaining open issues for sTTI Ericsson discussion  
 Rel-15 LTE\_sTTIandPT  
 - Nokia thinks that the restrictions is for the new transmission. Retransmission is up to eNB.  
 - LG asks what happens if the TTI length is not enough to perform the retransmission. Lenovo explains that the UE should just follow the grant.  
 => Noted  
  
 => TTI restrictions for the logical channel apply to only the first transmission. It is up the eNB how it schedules the retransmissions.
- R2-1712444 Outstanding issues for sTTI Ericsson discussion Rel-15 LTE\_sTTIandPT  
 => Noted
- R2-1712446 Remaining issues of sTTI and SPS Ericsson discussion Rel-15  
 LTE\_sTTIandPT  
 => Noted

*Proposal 2 SPS and sSPS are not active at the same time.*

- LG doesn't think that it is complicated to support simultaneous activation
- Ericsson doesn't see the use case
- Nokia supports proposal 2
- Qualcomm thinks that if we agree to 2 we should allow proposal 3. We have a use where you can have SPS for voice on low band and we want to support another low latency service in another carrier.

*Proposal 3 sSPS is not supported on SCells.*

- Qualcomm understands that in NR this is supported
  - LG thinks that we shouldn't support in SCell.
- => Noted

Agreements

- => Truncated BSR includes the LCG with the highest priority logical channel with data available for transmission
- => No new BSR triggers will be added

=> The current LTE prioritization between MAC CE and logical channel is maintained  
=> The following SPS interval values are supported in DL and UL: sTTI1, sTTI2, sTTI4, sTTI6, sTTI8, sTTI12, sTTI20, sTTI40, sTTI60, sTTI80, sTTI120, sTTI240  
=> SPS and sSPS are not active at the same time  
=> sSPS is not supported on SCells

- R2-1713322 Remaining Issues for sSPS Huawei, HiSilicon discussion Rel-15  
LTE\_sTTIandPT-Core  
=> Noted
- R2-1713245 SPS in sTTI LG Electronics Mobile Research discussion LTE\_sTTIandPT-Core  
=> Noted
- R2-1712447 Remaining SR and BSR issues Ericsson discussion Rel-15 LTE\_sTTIandPT
- oposal 1 The restrictions on scheduling request resources allowed for a logical channel shall be logicalChannelSrRestriction instead of sr-Config.*
- LG proposes *logicalChannelSrAllowed*. Ericsson thinks that allowed implies that we have to include always
- Proposal 2 After dssr-TransMax SPUCCH SR transmissions without the SR(s) being cancelled, release all SPUCCH resources on all serving cells on the next SPUCCH occasion when sss-ProhibitTimer is not running.*
- Huawei thinks that we should adopt the NR
  - LG thinks that we should make it simple and release all PUCCH resources. Ericsson thinks that going to RACH increases the latency. Qualcomm agrees. Nokia and Intel agree with the proposal.
  - LG asks what is the difference with NR. Nokia explains that in NR we have a one to one mapping and in LTE we allow to map to more than one SR
- Proposal 3 If a UE has no SR resources configured that match the logical channel logicalChannelSrRestriction, the UE shall send SR on any resource configured for SR.*
- Qualcomm is concerned that all logical channels can use sPUCCH. Intel doesn't think there will be a case in which we have a sSR resource and no SR.
  - LG thinks that we should have the same behaviour for release and not configured.
  - Qualcomm think that for the case that there is no PUCCH configured the UE should trigger RACH.
  - Samsung thinks that this defeats the purpose of the restriction.
  - Intel thinks that it may complicate UE implementation if we RACH while we have sPUCCH.
  - Huawei agrees with the proposal.
- Proposal 4 Base the SR resource selection on logicalChannelSrRestriction for the highest priority logical channel, belonging to a LCG, with data available for transmission.*
- Nokia asks if this is only for first transmission case
  - Nokia thinks that for retransmission all the SRs can be used. Intel agrees. Ericsson thinks its better to align.
  - LG thinks that for retx the UE should use the SRs for logical channels that have available data. Ericsson asks what does the UE do when you have two logical channel. Nokia explains that the UE would send it on the earliest occasion, similar to the case where the same logical channel is mapped to both SRs.
- Proposal 5 Adopt the text proposal above.*
- Proposal 6 dssr-Transmax have the same values as dsr-TransMax: dssr-TransMax ENUMERATED {n4, n8, n16, n32, n64, spare3, spare2, spare1}*

#### Agreements

=> The restrictions on scheduling request resources allowed for a logical channel shall be logicalChannelSrRestriction instead of sr-Config.  
=> After dssr-TransMax SPUCCH SR transmissions without the SR(s) being cancelled, release all SPUCCH resources on all serving cells on the next SPUCCH occasion when sss-ProhibitTimer is not running

=> If a UE releases the SR resources that match the logical channel logicalChannelSrRestriction, the UE shall send SR on any resource configured for SR  
=> If the UE is configured with only one SR resource, any logical channel can use this resource.  
=> For retransmission BSR, base the SR resource selection on logicalChannelSrRestriction for logical channels with data available for transmission. The UE transmits on the earliest available SR occasion, similar to the case where a logical channel can be mapped to both SRs.  
=> dssr-TransMax have the same values as dsr-TransMax: dssr-TransMax ENUMERATED {n4, n8, n16, n32, n64, spare3, spare2, spare1}

- R2-1712972 Remaining issues on SR for sTTI Nokia, Nokia Shanghai Bell discussion Rel-15  
LTE\_sTTIandPT  
=> remove the “else” in the SR on PUCCH for this TTI condition  
=> Noted
- R2-1713247 SR triggered by retransmission BSR LG Electronics Mobile Research discussion  
LTE\_sTTIandPT-Core  
=> not treated
- R2-1713250 SR on PUCCH and sPUCCH LG Electronics Mobile Research discussion  
LTE\_sTTIandPT-Core  
=> not treated
- R2-1712448 Scheduling Requests with short TTI Ericsson draftCR Rel-15 36.321 14.4.0 B  
LTE\_sTTIandPT  
=> not treated
- R2-1713316 SR failure handling for sTTI Huawei, HiSilicon discussion Rel-15  
LTE\_sTTIandPT-Core  
=> not treated
- R2-1713318 Handling of SR configurations for CA case in sTTI Huawei, HiSilicon discussion Rel-15  
LTE\_sTTIandPT-Core  
=> The intention of the proposals are agreeable but need to check if there is any specification impacts  
=> noted
- R2-1713317 Handling of SR triggered by retxBSR-Timer in sTTI Huawei, HiSilicon discussion  
Rel-15 LTE\_sTTIandPT-Core  
=> not treated
- R2-1712454 sPUCCH Utilization Strategy Ericsson discussion Rel-15 LTE\_sTTIandPT  
R2-1712455 Further MAC impacts of sTTI Ericsson discussion Rel-15 LTE\_sTTIandPT  
=> Include a general statement in 36.321 saying that the actions to be executed “for each TTI” shall be executed for all TTIs also in the case of overlapping TTIs.  
*Proposal 3: Add clarification regarding ability to decode a TB in 36.321.*  
- Nokia asks if this is an error case  
- Qualcomm and Nokia thinks that if you don't decode the UE behaviour is according to legacy, it will send an NACK.  
=> No note needed  
=> Noted
- R2-1712456 Further MAC impacts of sTTI Ericsson draftCR Rel-15 36.321 14.4.0 B  
LTE\_sTTIandPT  
=> Noted
- R2-1713315 MAC impact of HARQ process sharing between TTI and sTTI Huawei, HiSilicon discussion Rel-15 LTE\_sTTIandPT-Core  
- Intel thinks that a note can be added to just say the eNB should ensure this doesn't happen  
=> Noted

- R2-1713319 Handling of MAC CE Priority in sTTI Huawei, HiSilicon discussion Rel-15  
 LTE\_sTTIandPT-Core  
 => Not treated
- R2-1713320 Impacts of sTTI on L2 Timers Huawei, HiSilicon discussion Rel-15  
 LTE\_sTTIandPT-Core R2-1710401  
 => Not treated
- R2-1713321 HARQ Process ID Calculation to support SPS for sTTI Huawei, HiSilicon discussion  
 Rel-15 LTE\_sTTIandPT-Core  
 => Not treated
- R2-1713323 Running CR for SPS in sTTI TS 36.321 Huawei, HiSilicon, Ericsson CR Rel-15  
 36.321 14.4.0 1185 1 B LTE\_sTTIandPT-Core R2-1710404  
 => Not treated
- R2-1713328 Consideration on PHR for sTTI Huawei, HiSilicon discussion Rel-15  
 LTE\_sTTIandPT-Core  
*Proposal 1: no need to enhance the PHR triggering condition for sTTI.*  
*Proposal 2: PHR MAC CE should be extended to include the factor of sPUCCH/sPUSCH.*  
 - Ericsson and Nokia think that we need to wait for RAN1.  
 Option1: New MAC CE for sTTI  
 Option 2: One PHR and a mechanism indicate whether it is sPHR or PHR  
 Option 3: No changes to current PHR reporting. The eNB implicitly determines  
 => FFS how to report PHR for sTTI  
 => noted
- R2-1713813 Remaining Issues on SR for short TTI Qualcomm Incorporated discussion  
 => Not treated
- R2-1713882 TTI restriction for retransmission LG Electronics UK discussion LTE\_sTTIandPT  
 => Not treated
- R2-1714144 LS on additional agreements for shortened TTI and processing time for LTE (R1-1721216; contact: Ericsson) RAN1 LS in Rel-15 LTE\_sTTIandPT ToRAN2  
 => Noted

## 9.3 Void

## 9.4 Study on Enhanced Support for Aerial Vehicles

(FS\_LTE\_Aerial; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: SID: RP-171050)  
 Time budget: 1.5 TU

*Documents in this agenda item will be handled in a break out session*

### 9.4.1 General

(work plan and TR skeleton)

Including output of email discussion [99bis#08][LTE/UAV] Running TR36.777 (DCM)

LSs:

- R2-1712123 LS on RAN1 observation on RSRP statistics for aerial vehicles (R1-1719052; contact: NTT DOCOMO) RAN1 LS in Rel-15 FS\_LTE\_Aerial To:RAN2  
 => Noted
- R2-1712152 Reply LS on Certification/License and Identification of Aerial Vehicles (S2-178175; contact: Ericsson) SA2 LS in Rel-15 FS\_LTE\_Aerial To:RAN2 Cc:RAN3, SA3, SA1  
 => Noted
- R2-1714113 Reply LS on Certification/License and Identification of Aerial Vehicles (S1-174512; contact: Qualcomm)  
 => Noted
- R2-1713927 Liaison Statement on defining a common value for SPID for Unmanned Aircraft GSM Association LS in To:SA2, RAN2, RAN3  
 - Qualcomm think defining SPID is out of the scope of RAN2.

- Nokia think we should reply the request.
  - DCM think the key point is to identify the UE and control them.
  - Ericsson prefer to reply the LS in WI phase.
- => Noted

Running TR:

R2-1713543 TR 36.777 v040 NTT DOCOMO INC. draft TR Rel-15 36.777 0.4.0  
FS\_LTE\_Aerial

## 9.4.2 Requirements and parameter identification

*(Identify the heights, speeds, latency, reliability, data rate, positioning accuracy, etc , taking into account the regulation viewpoints)*

*No contribution is expected since the requirements studied are finalized.*

## 9.4.3 Potential enhancements for UAV interference problem

*(Solutions to detect whether UL signal from an air-borne UE increases interference in multiple neighbour cells and whether an air-borne UE incurs interference from multiple cells)*

*Including output of email discussion [99bis#30][LTE/UAV] Capture potential solutions for DL and UL Interference detection [DCM]*

R2-1713544 Summary of email discussion [99bis#30][LTE/UAV] Capture potential solutions for DL and UL Interference detection NTT DOCOMO INC. discussion Rel-15  
=> TP is endorsed.

R2-1713408 Interference detection in UAV scenarios Nokia, Nokia Shanghai Bell discussion Rel-15  
FS\_LTE\_Aerial  
=> Noted

R2-1713410 TP on mechanism for interference detection and UAV identification Nokia, Nokia Shanghai Bell discussion Rel-15 FS\_LTE\_Aerial  
- Qualcomm think we don't need to capture such details. Huawei and Ericsson have the same view.  
=> Noted

R2-1713536 Potential enhancements for UAV interference problem Ericsson discussion Rel-15  
FS\_LTE\_Aerial  
- Qualcomm support the TP and detailed wording can be improved.  
- Huawei think "on the type of backhaul" is not right.  
- DCM thin P3 is already captured in the TR.  
=> The TP is endorsed.

R2-1712901 Discussion for signaling exchange issues for UL interference detection Lenovo, Motorola Mobility discussion Rel-15 FS\_LTE\_Aerial

## 9.4.4 Potential enhancements for handover

*(Identify if enhancements in terms of cell selection and handover efficiency as well as robustness in handover signalling can be achieved)*

### 9.4.4.1 Handover simulation results

*Capturing the UAV simulation result into the TR 36.777*

*Including output from email discussion [99bis#31][LTE/UAV] Capture handover simulation results with observations [Huawei]*

R2-1713329 Summary of email discussion [99bis#31][LTE/UAV] Capture handover simulation results with observations Huawei discussion Rel-15 FS\_LTE\_Aerial  
=> Noted

R2-1713330 TP outcome of email discussion 99bis#31 Capture handover simulation results with observations Huawei discussion Rel-15 FS\_LTE\_Aerial

☞ **CBF to find a way to capture the simulation results. (Offline #111, Huawei). TP can be provided in R2-1714088.**



- R2-1713324 Discussion on New Measurement Events for Drones Huawei, HiSilicon discussion  
Rel-15 FS\_LTE\_Aerial
- R2-1713325 Discussion on Network Coordination solution Huawei, HiSilicon discussion Rel-15 FS\_LTE\_Aerial
- R2-1713332 Measurement Report Mechanism for Drones Huawei, HiSilicon discussion Rel-15 FS\_LTE\_Aerial
- R2-1713452 Mobility Simulations of Aerial UEs - full buffer case Ericsson discussion Rel-15 FS\_LTE\_Aerial R2-1711938
- R2-1713537 Mobility Simulations of Aerial UEs - full buffer RMa case Ericsson discussion Rel-15 FS\_LTE\_Aerial  
=> The simulation results should be captured in the TP R2-1714088 without changing any observations.
- R2-1713897 Simulation Results and Analysis of Mobility Issues for Drones Huawei, HiSilicon discussion Rel-15 FS\_LTE\_Aerial

#### 9.4.4.2 Mobility related field trial result

*Capturing the mobility field trial result into the TR36.777*

*Including output from email discussion [99bis#60][LTE/UAV] Capture field trial results (Qualcomm)*

- R2-1712586 Email discussion report [99bis#60] Field trial results for aerial vehicles Qualcomm  
Incorporated report Rel-15 FS\_LTE\_Aerial  
=> Remove "Editor's note: It is FFS whether to capture some or all of these observations in the main text of TR (in Section 6 and/or in Conclusion)."  
=> Remove "The number of strongest cell changes per second does decrease when the UE gets airborne."  
=> With this change, the TP should be captured in Annex in TR 36.777.
- R2-1713449 TP with corrections to field trials description Nokia, Nokia Shanghai Bell discussion  
Rel-15 FS\_LTE\_Aerial
- R2-1713326 Mobility related field trial result for drones Huawei, HiSilicon discussion Rel-15 FS\_LTE\_Aerial
- R2-1713538 Mobility performance for aerial vehicles in field trials Ericsson discussion Rel-15 FS\_LTE\_Aerial  
=> The simulation results which not overlapped with RAN1 can be merged into the TP and it should be addressed through email discussion of the running TR.

#### 9.4.4.3 Potential enhancements solutions

*Identify potential solutions for enhancements of UAV handover.*

*Including output from email discussion [99bis#61][LTE/UAV] Identify potential solutions on mobility enhancement (Ericsson)*

- R2-1713451 Summary on [99b#61][LTE/UAV] Identify potential solutions on mobility enhancement  
Ericsson discussion FS\_LTE\_Aerial  
=> Noted

Show hands on how to capture the handover procedure:

Capture the handover procedure (10)

Not Capture the handover procedure (3)

Show hands on how to capture flying path information:

Capture flying path information (9)

Not Capture flying path information (2)

Capture the following content into TR:

#### 7.X Potential enhancements for mobility performance

In this section, potential enhancements for mobility performance are presented.

Existing mobility enhancement mechanisms (e.g., mobility history reporting, mobility state estimation and UE assistance information, etc.) can be assessed first if they work for drones and if they need enhancements.

Handover procedure and related parameters for aerial UEs may be adjusted, based on UE's airborne status and location information.  
Existing measurement reporting mechanisms may be enhanced, e.g., by defining new events, enhancing triggering condition, controlling the amount of measurement reporting, etc.  
Flying path plan information might be used for mobility enhancement.

R2-1713953	TP on potential enhancements for mobility performance 15 FS_LTE_Aerial	Ericsson	discussion	Rel-
	- Nokia think the TP is not aligned with the email discussion report. Ericsson clarify that that is the reason why providing a company TP. Qualcomm share the view of Nokia.			
R2-1713264	Mobility enhancements for UAVs – planned route Rel-15 FS_LTE_Aerial R2-1711445	Nokia, Nokia Shanghai Bell	discussion	
R2-1713265	Mobility enhancements for UAVs – reference altitude discussion Rel-15 FS_LTE_Aerial	Nokia, Nokia Shanghai Bell		
R2-1713507	Considerations for cell selection and reselection with UAVs discussion	Kyocera, KT Corp, KDDI		
R2-1713539	Potential enhancements for mobility performance FS_LTE_Aerial	Ericsson	discussion	Rel-15
R2-1712306	RRC Reestablishment problem for UAV - DCM think solving interference issue can fix the problem. Nokia don't think so. - Ericsson think if no X2 interface, S1 handover is assumed and there will be no problem. => Noted	KDDI Corporation	discussion	
R2-1713790	Handover Failure Handling of Aerial UE FS_LTE_Aerial R2-1711376	LG Electronics Inc.	discussion	Rel-15
R2-1712469	Handover Enhancements for UAVs	Fraunhofer HHI	discussion	
R2-1713313	Consideration for potential mobility enhancement for aerial UE discussion Rel-15 FS_LTE_Aerial	Lenovo, Motorola Mobility		
R2-1713314	State management for aerial UEs 15 FS_LTE_Aerial	Lenovo, Motorola Mobility	discussion	Rel-
R2-1713526	UE-based mobility solution with Uplink Interference coordination	Kyocera	discussion	
R2-1713788	Handover Support using Positioning Identification 15 FS_LTE_Aerial R2-1711375	LG Electronics Inc.	discussion	Rel-
R2-1713789	Handover Support using TTT for Aerial UELG FS_LTE_Aerial R2-1711378	Electronics Inc.	discussion	Rel-15
R2-1712992	Discussion on measurement for Aerial Vehicles handover FS_LTE_Aerial R2-1711027	Sony	discussion	Rel-15

## 9.4.5 Identify certification

*(Identification of an air-borne UE that does not have proper certification for connecting to the cellular network while air-borne)*

R2-1714153	Text Proposal for UE Identification DoCOMo ☞ <b>CB on Friday=&gt;</b> Try to endorse the revised TP (offline#168, DCM) in R2-171XXXX			
R2-1713331	Potential enhancements for drones in idle state 15 FS_LTE_Aerial R2-1710409	Huawei, HiSilicon	discussion	Rel-
	- DCM think we need to first identify the mechanism before capturing the observations. LG and Qualcomm share the same view. => Noted			
R2-1713409	Discussion on SA2 LS on UAV certification Rel-15 FS_LTE_Aerial	Nokia, Nokia Shanghai Bell	discussion	
	=> Reply to SA2 LS to provide the endorsed TP, which is the revision of R2-1714153. => Draft LS in R2-171xxxx (Offline #168, Nokia)			
R2-1712944	Discussion on certification issues for response LS from SA2 discussion Rel-15 FS_LTE_Aerial	Lenovo, Motorola Mobility		

R2-1712945	Consideration for identification issues for drone UE discussion	Rel-15 FS_LTE_Aerial	Lenovo, Motorola Mobility	R2-1711380
R2-1712991	Discussion on identification and certification of Aerial Vehicles	Rel-15 FS_LTE_Aerial	Sony discussion	Rel-1711026
R2-1713327	Identification of Air-borne UE	FS_LTE_Aerial	Huawei, HiSilicon discussion	Rel-15
R2-1713447	Identify certification for drones	Ericsson	discussion	Rel-15 FS_LTE_Aerial
R2-1713488	Discussion on LS exchange with SA2 regarding "Certificate/Licence/Authorization"	Incorporated discussion	FS_LTE_Aerial	Qualcomm
R2-1713546	UAV UE Certification and License Identification	Rel-15 FS_LTE_Aerial	NTT DOCOMO INC. discussion	Rel-15

## 9.4.6 Others

Conclusion of the SI:

- R2-1714152 Text Proposal for Conclusion section of TR36.777
- ✍ **CB on Friday:**=> Revised in R2-171xxxx (offline#169, DCM)
    - The observations from field trial part should be considered.
    - RAN1 related conclusion should be endorsed by RAN1 first
  - ☒ **[100#09][LTE/UAV]TR 36.777(DCM)**
    - All endorsed TPs from RAN2 and RAN1 should be merged into the TR
    - Intended outcome: Agreed TR
    - Deadline: one week
    - => Agreed in R2-1714276 (v0.5.0)

## 9.5 Further video enhancements for LTE

*(LTE\_ViLTE\_enh2-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: WID: RP-171392)  
Time budget: 0.5 TU*

### 9.5.1 General

*(work plan)*

### 9.5.2 Local caching for UE assistance video request

*Including output from email discussions [99#33][LTE/eViLTE] UE assistance information (CMCC)*

R2-1713234	[99#33][LTE/eViLTE] UE assistance information	CMCC discussion	Rel-15
	LTE_ViLTE_enh2-Core		

#### Agreements:

- 1 the assistance bit is carried in PDCP layer, i.e. an indication inserted into the reserved bits of the PDCP header.
- 2 Activation / de-activation procedure of the assistance information transmission is performed via RRC signalling.
- 3 Activation / de-activation procedure is performed per UE.
- 4 UE reports its capability of assistance information for local cache through dedicated RRC signalling.

R2-1713236	Introduction of assistance information for local cache	Rel-15 36.306 14.4.0 1535 - B	CMCC, Intel Corporation	LTE_ViLTE_enh2-Core	CR
R2-1713237	Introduction of assistance information for local cache	Rel-15 36.323 14.4.0 0211 - B	CMCC, Intel Corporation	LTE_ViLTE_enh2-Core	CR
R2-1714159	Introduction of assistance information for local cache	Rel-15 36.323 14.4.0 0211 1 B	CMCC, Intel Corporation	LTE_ViLTE_enh2-Core	CR
	=> change "PDCP data SDU" to "PDCP SDU"				

=> The name should be further polished during email discussion.

✉ **[100#43][LTE/ViLTE] Introduction of assistance information for local cache in 36.331, 36.323 and 36.306 (CMCC)**

Use R2-1714159, R2-1714160, R2-1714158 as baseline

Intended outcome: Agreed CRs

Deadline: one week

=> Agreed in R2-1714281/82/83 (36.306 / 36.323 / 36.331)

R2-1713238	Introduction of assistance information for local cache	CMCC, Intel Corporation	CR
	Rel-15 36.331 14.4.0 3178 - B LTE_ViLTE_enh2-Core		
R2-1714160	Introduction of assistance information for local cache	CMCC, Intel Corporation	CR
	Rel-15 36.331 14.4.0 3178 1 B LTE_ViLTE_enh2-Core		

R2-1713235	Introduction of assistance information for local cache	CMCC, Intel Corporation	CR
	Rel-15 36.300 14.4.0 1076 - B LTE_ViLTE_enh2-Core		
	<ul style="list-style-type: none"> <li>- Huawei concerns on capturing the note in stage-2 CR.</li> <li>- Nokia think the CR is too detailed. Nokia think some of the content in the CR is not discussed.</li> <li>- CMCC just tries to provide the whole picture.</li> </ul>		
	=> Revised to R2-1714083.		

**CB on Thursday: Revised stage-2 CR [offline 124, CMCC]**

R2-1714083	Introduction of assistance information for local cache	CMCC, Intel Corporation	CR
	Rel-15 36.300 14.4.0 1076 1 B LTE_ViLTE_enh2-Core		
	<p>=&gt; Change to "UE assisted local cache is a solution to address long backhaul latency issue. The UE is allowed to transmit assistance information bit to eNB to enable the eNB to identify whether an uplink data needs to be transferred to the local cache entity, which may be co-sited with eNB or has direct connection with eNB, by operator implementation.</p> <p>UE can report to the network its capability of supporting UE assistance information for local cache. If supported, the UE assisted local cache function can be activated by the eNB. After that, the UE may indicate the assistance information in the uplink PDCP PDU. Whether the UE includes this assistance information is based on for instance the service from the application layer the UE requests that support local cache handling."</p>		
	=> With this change, the CR is agreed in R2-1714179.		

R2-1712724	Discussion on UE assistance information	Huawei, HiSilicon	discussion	Rel-15
	LTE_ViLTE_enh2-Core			

R2-1713770	Solutions on UE assisted information for local cache	Qualcomm Incorporated	discussion
	Rel-15 LTE_ViLTE_enh2-Core		

R2-1713771	Introduction of assistance information for local cache (PDCP)	Qualcomm Incorporated
	draftCR Rel-15 36.323 14.4.0 B LTE_ViLTE_enh2-Core	

R2-1713779	Introduction of assistance information for local cache (RRC)	Qualcomm Incorporated
	draftCR Rel-15 36.331 14.4.0 B LTE_ViLTE_enh2-Core	

R2-1713780	Introduction of assistance information for local cache (capabilities)	Qualcomm Incorporated
	draftCR Rel-15 36.306 14.4.0 B LTE_ViLTE_enh2-Core	

### 9.5.3 Enhancement to solve the problem of critical data discard

R2-1712617	Solution details on awareness of critical data	Intel Corporation	discussion	Rel-15
	LTE_ViLTE_enh2-Core			
	<ul style="list-style-type: none"> <li>- LG think the awareness of critical data for eNB cannot help.</li> <li>- Intel think this solution can work together with discard timer solution.</li> <li>- Intel think how to use the indication depending on eNB implementation.</li> <li>- Qualcomm wonders how to set the reserved bit.</li> <li>- Ericsson think introducing this indication will impact the existing framework of QoS. Ericsson think the indication is not useful.</li> <li>- Nokia concerns how UE identifies the critical data.</li> <li>- Nokia think it is hard and complicated for eNB implementation.</li> <li>- Intel trust network vendor to sue the indication properly.</li> </ul>			

- Huawei think the indication benefits.
  - LG think the existing QoS can handle the critical data. Ericsson share the same view.
  - Intel think the indication can provide useful information for the existing QoS framework.
- => Noted.

R2-1712618	Introduction of reporting of critical data stored in the UL buffer (R bit)	Intel Corporation	
	CR Rel-15 36.321 14.4.0 1191 - B LTE_ViLTE_enh2-Core		
R2-1712619	Introduction of reporting of critical data stored in the UL buffer (BSR content)	Intel Corporation	
	CR Rel-15 36.321 14.4.0 1192 - B LTE_ViLTE_enh2-Core		
R2-1712620	Introduction of reporting of critical data stored in the UL buffer	Intel Corporation	CR
	Rel-15 36.331 14.4.0 3136 - B LTE_ViLTE_enh2-Core		
R2-1712621	Introduction of reporting of critical data stored in the UL buffer	Intel Corporation	CR
	Rel-15 36.306 14.4.0 1517 - B LTE_ViLTE_enh2-Core		

R2-1712725	Discussion on L2 differentiated handling for upper layer critical data discussion	Huawei, HiSilicon	
	Rel-15 LTE_ViLTE_enh2-Core R2-1707940		
	- Ericsson think adjusting the discard timer benefits.		
	- Huawei wonders whether Ericsson would like to introduce a new timer. Ericsson clarifies that using the same timer with different values.		
	- Qualcomm wonders the difference between one timer with two values and two timers.		
	- Ericsson think timer value can be dynamically adjusted according the data type in the buffer.		
	- OPPO wonder how to reconfigure the value of the timer accordingly.		
	- OPPO think the adjusting is complicated and prefer to use one value.		
	- LG think adjusting value should introduce new PDCP procedure.		
	- CMCC think adjusting value is complicated. CMCC prefer to introduce a new timer. Ericsson request CMCC to see the CR provided by Ericsson.		
	- OPPO prefer to use one timer with one value.		
	=> Noted		

R2-1713421	L2 differentiated handling for critical data	Ericsson	discussion	Rel-15
	LTE_ViLTE_enh2-Core			
R2-1713685	Discussion on different handling for critical data	LG Electronics France	discussion	Rel-15
	LTE_ViLTE_enh2-Core			
R2-1713420	eNB awareness of critical data in UE buffer	Ericsson	discussion	Rel-15
	LTE_ViLTE_enh2-Core			

**CB on Thursday: WF on enhancement to solve the problem of critical data discard [offline 123, Ericsson]**

=> Because there is no consensus on the benefit of the solutions among different companies, RAN2 have to conclude that no solution for solving the problem of critical data discard will be specified in this WI due to limited time.

=> Companies in RAN2 are fine to complete the WI without the solution for solving the problem of critical data discard.

R2-1712726	Introduction of new PDCP discard timer	Huawei, HiSilicon	CR	Rel-15	36.300
	14.4.0 1074 - B LTE_ViLTE_enh2-Core				
R2-1712727	Introduction of new PDCP discard timer	Huawei, HiSilicon	CR	Rel-15	36.323
	14.4.0 0207 - B LTE_ViLTE_enh2-Core				
R2-1712728	Introduction of new PDCP discard timer	Huawei, HiSilicon	CR	Rel-15	36.306
	14.4.0 1520 - B LTE_ViLTE_enh2-Core				
R2-1712729	Introduction of new PDCP discard timer	Huawei, HiSilicon	CR	Rel-15	36.331
	14.4.0 3146 - B LTE_ViLTE_enh2-Core				
R2-1713422	L2 differentiated handling of critical data	Ericsson	CR	Rel-15	36.331 14.4.0 3185
	- B LTE_ViLTE_enh2-Core				
R2-1713423	L2 differentiated handling for critical data	Ericsson	CR	Rel-15	36.323 14.4.0 0213
	- B LTE_ViLTE_enh2-Core				
R2-1713424	L2 differentiated handling for critical data	Ericsson	CR	Rel-15	36.306 14.4.0 1539
	- B LTE_ViLTE_enh2-Core				

R2-1713686	Differant handling for critical data	LG Electronics France	CR	Rel-15	36.323	14.4.0	0214
-	B	LTE_ViLTE_enh2-Core					
R2-1713689	Differant handling for critical data	LG Electronics France	CR	Rel-15	36.331	14.4.0	3196
-	B	LTE_ViLTE_enh2-Core					

#### 9.5.4 Others

### 9.6 QoE Measurement Collection for streaming services in E-UTRAN

(LTE\_QMC\_Streaming; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17; WID: RP-170956)  
Time budget: 0 TU

*Documents in this agenda item will be handled in a break out session*

The WI has no time budget allocated for this meeting. CRs to conclude the WI were agreed in principle in RAN2#99bis, and hence this AI is only for handling of those CRs and any necessary modifications/corrections to those CRs.

R2-1712159	LS on adding new service type in QMC reporting (S4-170952; contact: Ericsson)	SA4	LS in
Rel-15	LTE_QMC_Streaming, EQoE_MTSI, QOED	To:RAN2, RAN3, SA5	
-	Ericsson point that the attached CR was already agreed.		
-	Huawei think SA4 did some work which should be done in RAN2.		
-	Huawei think adding new service type is out of the scope of current WI.		
-	Nokia prefer to discuss this in TEI15.		
=>	Adding new service type should discussed in TEI15.		

#### 9.6.0 In principle agreed CRs

R2-1712705	Introduction of QoE Measurement Collection for LTE	Huawei, HiSilicon	CR	Rel-
15	36.300 14.4.0 1073 - B	LTE_QMC_Streaming-Core		
=>	CR is agreed			
R2-1712706	Introduction of QoE Measurement Collection for LTE	Huawei, HiSilicon	CR	Rel-
15	36.306 14.4.0 1519 - B	LTE_QMC_Streaming-Core		
=>	CR is agreed			
R2-1712707	Introduction of QoE Measurement Collection for LTE	Huawei, HiSilicon	CR	Rel-
15	36.331 14.4.0 3144 - B	LTE_QMC_Streaming-Core		
=>	CR is agreed			

#### 9.6.1 Others

R2-1712464	Handling of incoming LS on new service type in QMC reporting	Ericsson	discussion	
Rel-15	LTE_QMC_Streaming			
R2-1712465	Introduction of QoE Measurement Collection for MTSI services	Ericsson	CR	Rel-
15	36.300 14.4.0 1072 - B	LTE_QMC_Streaming		
R2-1712466	Introduction of QoE Measurement Collection for MTSI services	Ericsson	CR	Rel-
15	36.306 14.4.0 1516 - B	LTE_QMC_Streaming		
R2-1712467	Introduction of QoE Measurement Collection for MTSI services	Ericsson	CR	Rel-
15	36.331 14.4.0 3134 - B	LTE_QMC_Streaming		
R2-1712461	Outstanding problem with QoE configuration	Ericsson	discussion	Rel-15
	LTE_QMC_Streaming			
-	Nokia think it is optimisation. Nokia think the solution is complicated.			
-	Huawei think we need to identify the whole the picture of the solution and expect that other working groups will be involved.			
-	Ericsson indicate that RAN3 CR is already provided by Ericsson.			
=>	Noted.			
R2-1712462	Improved handling of QoE configuration	Ericsson	CR	Rel-15 36.300 14.4.0 1071
-	C	LTE_QMC_Streaming		
R2-1712463	Improved handling of QoE configuration	Ericsson	CR	Rel-15 36.331 14.4.0 3133
-	C	LTE_QMC_Streaming		

## 9.7 LTE connectivity to 5G-CN

(*LTE\_5GCN\_connect-Core*; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171432)

Time budget: 1.5 TU

At this meeting, due to the commonality with NR, this WI will be handled in the main session.

### 9.7.1 Organisational

*Including incoming LSs, rapporteur inputs, running CRs*

*Principles on what to specify in which specs, terminology, etc*

LSs

- R2-1712103 Reply LS on CN node selection for LTE features when E-UTRA is connected to 5G CN (C1-174593; contact: Qualcomm) CT1 LS in Rel-15 5GS\_Ph1-CT To:RAN2  
Cc:SA2
- Ericsson think the answers are ambiguous. There was not clear answer if the lower layers can be involved in selecting the core in the case that the certain functionality is not supported by the 5GC is not supported. in SA2 is says that 5GC should be selected in the PLMN supports it.
  - Huawei also think there is no answer for this case but is being discussed by CT1 that in some cases the 5GC mode can be disabled.
  - Samsung think in the end it is up operator preferences and it might not follow the SA2 requirement.
  - Intel think we agreed the selection is in NAS and CT1 have confirmed this. But it might make sense if some AS information is provided for NAS to make the decision, e.g. if a service is not support in 5GC.
- => Noted  
=> RAN2 confirm that understanding that if cell (re)selection takes the UE to a cell that only support EPC then this information is provided to NAS which will cause NAS to select EPC.
- R2-1712161 Reply LS to LS on supported features by 5GC for E-UTRA connected to 5G CN (S5-175495; contact: Nokia) SA5 LS in Rel-15 FS\_5GS\_Ph1\_CH, QOED To:RAN2  
Cc:SA1, SA2, CT1, RAN3
- Ericsson think that we cannot respond on MDT but we can respond on the QMC streaming part. Intel think QMC just reuses MDT and hence if we don't have MDT then we can't have QMC.
  - Huawei think we have already responded on MDT and the reason they ask if that we said it could be supported, and they want confirmation.
  - DT think we can response it can be supported from AS point of view and it is up to other groups to decide.
  - Nokia point out there is a trace id that does not distinguish between CN types.
- => Respond that the RAN2 point of view the E-UTRA radio interface functionality for MDT and QMC streaming is the same for EPC and 5GC and hence can be supported. It is up to other groups to indicate if it can be supported from their perspective.  
=> Draft LS in R2-1714157 (Offline discussion #35, Nokia)
- R2-1714157 [DRAFT] Reply LS on supported features by 5GC for E-UTRA connected to 5G CN Nokia LS out Rel-15 LTE\_5GCN\_connect-Core To:SA5  
=> Approved in R2-1714203

*Rapporteur inputs*

- R2-1712661 The impact on TS36.331 due to E-UTRA connected to 5GC Intel Corporation  
discussion Rel-15 LTE\_5GCN\_connect-Core
- P1
- Nokia has some concern about a generic note. We would be very careful how we do this.
- P2
- OPPO is not clear that we should not distinguish between the 2 cores. Intel think we can continue to refer to upper layers without being specific.
  - Samsung think we can agree with this in general and we generally only refer to upper layers. But in 304 we might need to be more specific.
  - LG think P1 and P2 are a good target.

P5

=> Offline discussion to progress the on the principles to be used when trying to capture the E-UTRA connected to 5GC in 36.331. (Offline discussion #36, Intel)

R2-1714181 Offline discussion #36-the principles on capturing eLTE into RRC Intel discussion Rel-15 LTE\_5GCN\_connect-Core

**Agreements**

- 1: Do not change the terms E-UTRAN, EPC, MME, eNB which are used in relation to E-UTRA connected to EPC unless necessary.
- 2: 'When UE connects to EPC...' and 'When UE connects to 5G-CN...' is used in procedure part when we need to define UE behaviour specific for a UE using E-UTRA with EPC and a UE using E-UTRA with 5G-CN. Other text may be needed for the case when 'When UE connects to EPC...' and 'When UE connects to 5G-CN...' is not suitable.
- 3: Do not change the term NAS/upper layer used in TS36.331 unless it is really needed.
- 4: RAN2 aim to reuse the fields/IEs/structures introduced for EN-DC if they are also applicable for E-UTRA connected to 5GC, e.g. NR PDCP configuration

R2-1712662 Running 36.331 CR for E-UTRA connected to 5GC Intel Corporation CR Rel-15 36.331 14.4.0 3142 - B LTE\_5GCN\_connect-Core

**[100#24][LTE/5GC] 36.331 running CR (Intel)**

Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14

=> Endorsed in R2-1714286

**[100#25][LTE/5GC] 36.300 running CR (Huawei)**

Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14

=> Endorsed in R2-1714285

## 9.7.2 Stage 2 aspects independent from NR/5GC

*Including AS support for EPC/5GC selection, inter-RAT mobility (e.g. between E-UTRA/5GC and E-UTRA/EPC but not mobility in inactive which is addressed by AI 10.4.1.7.4), etc.  
PDCP version change*

R2-1713134 NR PDCP configuration for SRB for UE accessing 5GC via ng-eNBHuawei, HiSilicon discussion Rel-15 LTE\_5GCN\_connect-Core

P1

- Qualcomm think that we can reuse the legacy security elements here.

P2

- Nokia is not sure of the status in SA3 of security for this case. Will they reuse existing security or new 5G security.
- ZTE think the message should support the new algorithms but which to use should be discussed in SA3.
- Qualcomm think we could use the LTE algorithms only so there would be no change to the message. Think we could continue to use them until 5G adds new algorithms in the future.
- Ericsson assume this is NR PDCP and support the proposal

P3

- ZTE support the explicit reconfiguration. This is anyway needed if the network wants to change the default configuration.
- Lenovo think this rules out changing PDCP type after SMC. But think an implicit method might be safer. But if we go with explicit then we need to consult SA3 about an unprotected reconfiguration. ZTE think his just changes a configuration that was first done without security protection.
- LG prefer to use an explicit configuration.
- Ericsson think an explicit reconfiguration before the SMC.
- Qualcomm think that it should be explicit but before or after the SMC.



- Intel think the implicit method could be used.

**Agreements**

- 1: The legacy LTE SMC procedure (possibly with extensions to SMC message) is reused to activate initial AS security for the UE accessing 5GC via E-UTRA connected to 5GC.  
FFS: Whether the SMC message indicates security algorithm ID using existing LTE code points or new 5G code points(i.e. neaX and niaX algorithms).
- 2 UE reconfigures to NR PDCP before the SMC is received  
FFS Whether the reconfiguration to NR PDCP is performed via an explicit or implicit reconfiguration for SRB1 before SMC.
- 3 The UE is configured with NR PDCP for SRB2 when SRB2 is established.

=> Offline discussion to try to progress the second FFS on the method to reconfigure to NR PDCP (Offline discussion #37, Huawei)

- R2-1714174 Report from offline discussion #037 Huawei report Rel-15 LTE\_5GCN\_connect-Core  
=> Discussion to be continued to the next meeting
- R2-1712263 SRB1 PDCP version change for UEs connecting to 5GCN through E-UTRAN Qualcomm Inc discussion Rel-15 LTE\_5GCN\_connect-Core
- R2-1712610 PDCP type change for eLTE ZTE Corporation, Sane Chips discussion Rel-15
- R2-1712658 Usage of NR PDCP for SRBs Intel Corporation discussion Rel-15 LTE\_5GCN\_connect-Core
- R2-1712779 Consideration on SRB configuration in eLTE vivo discussion Rel-15 LTE\_5GCN\_connect-Core R2-1710951
- R2-1713610 Consideration on PDCP version change in eLTE LG Electronics France discussion LTE\_5GCN\_connect-Core
- CN selection/CN type availability*
- R2-1713270 Barring legacy UEs from 5GC only cells Ericsson discussion Rel-15 LTE\_5GCN\_connect-Core

Proposal 1 The cellReservedForOperatorUse flag in SIB1 is used to bar legacy UEs from camping on a 5GC cell in the case when some PLMNs hosted by the eNB are connected to 5GC only.

- R2-1712659 Further consideration on CN type indication and CN type selection Intel Corporation discussion Rel-15 LTE\_5GCN\_connect-Core
- Discussed jointly with previous paper
  - Qualcomm think the reserved for operator use flag is meant for a different use case and our design should be more backward compatible for legacy UEs.
  - Ericsson is concerned about the size by adding the new list in SIB1. The AC11/15 case is a corner case.
  - Vodafone is concern about the action of the UE when it sees the cell reserved.
  - Samsung think using the reserved flag is an ugly solution and also this approach does not prevent UEs from attempting emergency calls. Think it is straight forward to add a new list.
  - ZTE think we can't ensure that there are no AC11/15 UEs in the network that don't support 5GC.
  - CATT prefer to avoid impacts to legacy UEs hence prefer to add a new PLMN. OPPO also prefer this.

P1

- Ericsson thinks there would be need to bar new UEs capable for 5GC for test purposes so a new flag is needed.
- Vodafone think the cellReservedForOperatorUse is mainly used for cell testing purposes and hence one bit per PLMN per cell is ok.
- 

**Agreements**

- 1 Introduce a new 5GC PLMN list containing PLMNs that can connect to 5GC (coding details to be worked offline to avoid any need for repeating a PLMN ID if already present in the legacy PLMN list)
- 2 "cellReservedForOperatorUse" is introduced for PLMNs which can connect to 5GC only.
- 3 5GC specific "cellReservedForOperatorUse" is introduced for PLMNs which can connect both EPC and 5GC.
- 4 UE AS indicates available CN types to upper layers for CN type selection.

- R2-1712171 Further considerations on the CN selection for E-UTRAN connected to 5G CN Samsung  
discussion Rel-15 LTE\_5GCN\_connect-Core
- R2-1712172 CN type indication for E-UTRAN connected to 5G CN Samsung discussion Rel-  
15 LTE\_5GCN\_connect-Core
- R2-1712217 Clarification on NAS and AS Function Division for CN Type Selection OPPO discussion  
Rel-15
- R2-1712222 Discussion on EPC and 5GC Selection During for Intra-LTE Handover with CN Type Change  
OPPO discussion Rel-15 LTE\_5GCN\_connect-Core
- R2-1712264 Preventing Legacy LTE UEs from camping on eLTE Cells & PLMNs connected to New 5G Core  
Network only Qualcomm Inc discussion Rel-15 LTE\_5GCN\_connect-Core R2-  
1710157
- R2-1712285 How to Handle the Case Only Some PLMNs Have Access to 5GC? OPPO discussion  
LTE\_5GCN\_connect-Core
- R2-1712588 Multi-PLMN aspects of E-UTRA cell connected to 5GC ZTE Corporation, Sane Chips  
discussion Rel-15 R2-1710420
- R2-1712778 CN selection for LTE connected to 5GC vivo discussion Rel-15 LTE\_5GCN\_connect-  
Core R2-1710950
- R2-1712864 Further Consideration on CN Type Selection CATT discussion R2-1710305
- R2-1713130 Discussion on CN selection Huawei, HiSilicon discussion Rel-15  
LTE\_5GCN\_connect-Core
- R2-1713131 Draft LS to CT1 on CN selection Huawei LS out Rel-15 LTE\_5GCN\_connect-Core  
To:CT1
- R2-1713132 Handling on E-UTRA cell where some PLMNs only have access to 5GC Huawei, HiSilicon  
discussion Rel-15 LTE\_5GCN\_connect-Core R2-1711109
- R2-1713745 Discussion on CN type selection in RRC connection re-establishment HTC Corporation  
discussion LTE\_5GCN\_connect-Core

*Inter-RAT mobility*

- R2-1713271 Inter-system and inter-RAT mobility for LTE connected to 5GC Ericsson discussion  
Rel-15 LTE\_5GCN\_connect-Core
- R2-1712780 Mobility issue in LTE connected to NextGen Core vivo discussion Rel-15  
LTE\_5GCN\_connect-Core R2-1710949
- R2-1712989 Handover involving EPC and 5GC Sony discussion Rel-15 LTE\_5GCN\_connect-Core  
R2-1711024
- R2-1713135 Stage 3 design on intra-E-UTRA inter-system HO Huawei, HiSilicon discussion Rel-  
15 LTE\_5GCN\_connect-Core

*Security*

- R2-1713266 Security aspects of supporting LTE connected to 5GC Ericsson discussion Rel-  
15 LTE\_5GCN\_connect-Core

=> LS to SA3 to ask about (detail wording to questions to be worked offline):

- key derivation mechanisms at mobility events
  - AS security algorithms (and labels for the algorithms)
  - provision of UE AS security capabilities (CT1 cced)
  - addition of future NR algorithms (including 256 bit algorithms)
- => Draft LS in R2-1714163 (Offline discussion #38, Ericsson)

=> Check offline what requirements SA3 have provided to us for UP IP when LTE connected to 5GC. If not clear requirement has been provided then we can ask them in the LS

R2-1714163	[DRAFT] LS on Security aspects of supporting LTE connected to 5GC out Rel-15 LTE_5GCN_connect-Core To:SA3 Cc:CT1 => Remove " based on the SA3 answer in R2-1714167" => Approved in R2-1714244	Ericsson	LS
R2-1712261	Draft LS on AS Security Aspects of LTE connectivity to 5G-CN 15 LTE_5GCN_connect-Core To:CT1, SA3	Qualcomm Inc	LS out Rel-
R2-1712262	Access Stratum Security aspects of E-UTRAN connected to 5GCN Rel-15 LTE_5GCN_connect-Core R2-1710159	Qualcomm Inc	discussion
R2-1712660	Support of security for eLTE LTE_5GCN_connect-Core	Intel Corporation	discussion Rel-15
R2-1713136	Support of 5GS security in E-UTRA connected to 5GC Rel-15 LTE_5GCN_connect-Core	Huawei, HiSilicon	discussion
R2-1713233	Discussion on execution time of SMC Core	CMCC	discussion Rel-15 LTE_5GCN_connect-
R2-1713267	Draft LS on Security aspects of supporting LTE connected to 5GC 15 LTE_5GCN_connect-Core To:SA3	Ericsson	LS out Rel-
R2-1713742	Discussion on Intra-Cell Handover with CN Type Change LTE_5GCN_connect-Core	OPPO	discussion Rel-15

*Other*

R2-1712663	Support of positioning for E-UTRA connected to 5GC Rel-15 LTE_5GCN_connect-Core	Intel Corporation	discussion
R2-1712223	Discussion on Radio Bearer and Lower Layers Configuration in eLTE Rel-15 LTE_5GCN_connect-Core	OPPO	discussion
R2-1712286	Discussion on ANR Functionality for eLTE Rel-15 LTE_5GCN_connect-Core	OPPO	discussion NR_newRAT-Core R2-1710201
R2-1713133	Handling the features not supported in 5GC but supported in EPC discussion Rel-15 LTE_5GCN_connect-Core	Huawei, HiSilicon	
R2-1713268	QoS for LTE connected to 5GC Core	Ericsson	discussion Rel-15 LTE_5GCN_connect-
R2-1713269	Inactive state in LTE	Ericsson	discussion Rel-15 LTE_5GCN_connect-Core
R2-1713272	Handling of Collision between UE Identifier in LTE connected to 5GC discussion Rel-15 LTE_5GCN_connect-Core	Ericsson	
R2-1713273	Message 3.5 in LTE connected to 5GC Core	Ericsson	discussion Rel-15
R2-1713611	RRC procedures for LTE connectivity to 5G-CN 15 LTE_5GCN_connect-Core R2-1711122	LG Electronics France	discussion Rel-

*Withdrawn*

R2-1712218	Preventing Legacy UE and 5GC UE from Camping on 5GC-only and EPC-only eLTE Cells	OPPO	discussion Rel-15 LTE_5GCN_connect-Core R2-1710176	Withdrawn
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### 9.7.3 Stage 2 aspects dependent on NR/5GC

*Including impact to E-UTRA DC due to flow based QoS, operation of flow based QoS at intra system handover and inter system handover, access control, inactive state, and slicing. These will be discussed when NR has made more progress on these items, and hence will not be discussed at this meeting.*

R2-1712220	Discussion on Access Control for eLTE Core	OPPO	discussion Rel-15 LTE_5GCN_connect-
R2-1712265	RRC INACTIVE State aspects for E-UTRAN connected to 5GCN Rel-15 LTE_5GCN_connect-Core	Qualcomm Inc	discussion
R2-1712865	Inactive State Modelling in LTE Connectivity to 5G-CN	CATT	discussion R2-1708244
R2-1712918	Number of DRBs in E-UTRA connected to 5GC Core	Ericsson	discussion Rel-15
R2-1713632	Support for PLMN selection while in INACTIVE state in eLTE discussion Rel-15 LTE_5GCN_connect-Core R2-1711127	LG Electronics Inc.	

R2-1713634 INACTIVE state in eLTE LG Electronics Inc. discussion Rel-15 LTE\_5GCN\_connect-  
Core R2-1711145  
R2-1713757 Assistance information delivery for E-UTRA connected 5GC LG Electronics Inc.  
discussion Rel-15 R2-1711157

## 9.8 Positioning Accuracy Enhancements for LTE

(LCS\_LTE\_acc\_enh-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-171508)  
Time budget: 0 TU

*This AI is a placeholder only - no documents to be submitted to this AI. The WI has no time budget allocated for this meeting and will be discussed again at RAN2#101.*

### 9.8.1 Organisational

*Including incoming LSs, rapporteur inputs, running CRs*

### 9.8.2 GNSS positioning enhancements

*RTK payload transmission, transparent or not? Supported RTK techniques, SSR, VRS, PPP, etc? The details on the support of UE based and UE assisted; The details about unicast and broadcast of RTK assistance data;*

### 9.8.3 Support for IMU positioning

*The details of IMU raw data; the scenario and benefits on how to use IMU raw data;*

### 9.8.4 UE-based OTDOA positioning

*What additional assistance information is required? Note, as second priority*

### 9.8.5 Broadcasting of assistance data

*SIB design for the transmission of A-GNSS, RTK and, as second priority, UE-based OTDOA assistance information. Encryption of assistance data broadcasting (SA3 input is needed);*

## 9.9 Enhancing CA Utilization

(LTE\_euCA-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-170805)  
Time budget: 1 TU

*Documents in this agenda item will be handled in a break out session*

### 9.9.1 General

*Including incoming LSs, work plan, rapporteur inputs, running CRs*

R2-1713158 Discussion on running CRs for euCA Nokia, Nokia Shanghai Bell discussion Rel-  
15 LTE\_euCA-Core  
=> Noted

R2-1713159 Stage-2 running CR for euCA Nokia, Nokia Shanghai Bell discussion Rel-15  
LTE\_euCA-Core  
=> used as the starting point for email discussion.  
 **[100#28][LTE/euCA]Running stage-2 CR for euCA (Nokia)**  
Capture related the agreements from this meeting and the previous meetings.  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14=> Endorsed in R2-1714289

R2-1713160 RRC running CR for euCA Nokia, Nokia Shanghai Bell discussion Rel-15  
LTE\_euCA-Core  
=> used as the starting point for email discussion.  
 **[100#29][LTE/euCA]Running stage-3 CR for euCA (Nokia)**  
Capture related the agreements from this meeting and the previous meetings.  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14

=> Endorsed in R2-1714287 (RRC) and R2-1714288 (MAC)

1714148 Reply LS on RAN2 agreements for enhanced CA utilization WID  
=> Noted

1714149 LS response on reduced SCell activation time for enhanced CA utilization WID  
- Ericsson think there is misunderstanding in RAN4 for the state change.  
- Huawei think the delay mostly coming from obtaining resource for CQI report according to the LS.  
- Nokia think according the LS, introducing new state has no gain in latency.  
=> Noted

## 9.9.2 Delay reduction for SCell set-up

*Including output of email discussion [99bis#32][LTE/euCA] Faster activation for Scells (Nokia)*

R2-1713170 Report of email discussion [99bis#32][LTE/euCA] Faster activation for Scells Nokia  
(rapporteur) report Rel-15 LTE\_euCA-Core  
- Huawei think the existing mechanism of activation should not be ruled out. Nokia indicate that nothing from the existing mechanism is ruled out.  
- vivo indicate that there is CQI ambiguous issue for further study.

### Agreements:

- 1 Support configuring SCell directly in activated/deactivated state in Rel-15. FFS how to solve the CQI ambiguous and PDCCH monitoring timing issues.

*New state:*

R2-1712255 Fast SCell activation for enhanced CA utilization Qualcomm , AT&T, Verizon discussion  
Rel-15 LTE\_euCA, LTE\_euCA-Core R2-1710138  
- Nokia prefer to not introduce L1 signalling.  
- LG concern the power consumption.  
- Huawei think the latency gain is limited.  
- ATT and Sprint support to introduce the new state.  
- Ericsson think the power consumption should be compared with DRX.  
- Qualcomm indicate the DRX is not configured in their assessment.

Show hands on "Introduce a New SCell fast activation state"

- 1) Not introduce L1 signalling
- 2) Only period CQI report
- 3) without PDCCH monitoring

- Support to introduce this new state (6+Verizon)
- Not support (3)

### Agreements:

- Introduce a New SCell fast activation state as follows:
- 1) Not introduce L1 signalling
  - 2) Only period CQI report based on CRS
  - 3) without PDCCH monitoring

=> Send LS to RAN1 & RAN4 about L1 signalling usage for SCell state transition and timeline requirements

☞ **CB on Friday:** => Draft LS in R2-171xxxx to inform RAN1 and RAN4 our agreements of introducing new SCell fast activation state. (Offline 144, Qualcomm)

### Agreements:

- 1 Transition between legacy SCell deactivated state and fast activation state is via MAC-CE (i.e., similar to legacy).
- 2 Legacy state transition mechanisms are applicable for transition between legacy SCell activated and SCell deactivated states.

*Direct activation:*

- R2-1713164 Direct activation of configured Scells Nokia, Nokia Shanghai Bell discussion Rel-15 LTE\_euCA-Core
- R2-1712256 Fast SCell Configuration through Quick SCell Measurement Reporting Qualcomm Inc discussion Rel-15 LTE\_euCA, LTE\_euCA-Core
- R2-1712258 Draft LS on usage of L1 Signaling and timeline for SCell State transition Qualcomm Inc LS out Rel-15 LTE\_euCA-Core R2-1710770 To:RAN1, RAN4
- R2-1713226 Initial status of SCell for enhancing CA utilization LG Electronics Mobile Research discussion LTE\_euCA-Core
- R2-1713622 Direct activation at configuration Ericsson discussion Rel-15 LTE\_euCA-Core

*Enhance the existing SCell activation:*

- R2-1713336 Delay reduction for SCell Activation Huawei, HiSilicon discussion Rel-15 LTE\_euCA-Core
- Qualcomm don't think there is real gain.

**Agreements:**

- 1 The short period of the CQI reporting resource could be only available upon receiving the SCell activation command. FFS when the UE fall back to longer periodicity.

Show hands on the proposal "The short period of the CQI reporting resource could be only available upon receiving the SCell activation command and be disabled after the eNB scheduling the UE on the activated SCell"

- Support (4)
- Not (2)

*Idle measurement:*

- R2-1712831 UE selection for measurement of faster Scells activation vivo discussion
- Nokia wonder how to use the indication.
  - LG and Nokia think it should be controlled by eNB.
- => Noted
- => Postpone the proposal 2 until when we have detailed solution of idle measurement.
- R2-1713162 Security aspects of IDLE mode measurements Nokia, Nokia Shanghai Bell discussion Rel-15 LTE\_euCA-Core
- R2-1712832 Analysis on the Security and Configuration Issues of IDLE State Measurement vivo discussion
- R2-1713161 Faster IDLE mode measurements Nokia, Nokia Shanghai Bell discussion Rel-15 LTE\_euCA-Core
- R2-1713163 Draft LS to SA3/RAN3 on RAN2 agreements for SCell delay reduction Nokia, Nokia Shanghai Bell discussion Rel-15 LTE\_euCA-Core
- R2-1713334 Message selection for IDLE Mode Measurement Report Huawei, HiSilicon discussion Rel-15 LTE\_euCA-Core
- R2-1713620 CA establishment from Idle Ericsson discussion Rel-15 LTE\_euCA-Core
- R2-1713724 Reporting condition of IDLE measurements LG Electronics Inc. discussion Rel-15 LTE\_euCA-Core

*Suspend state:*

- R2-1713621 RRC Suspended and CA establishment Ericsson discussion Rel-15 LTE\_euCA-Core

*Others:*

- R2-1713623 Measurement improvements for euCA Ericsson discussion Rel-15 LTE\_euCA-Core

CRs:

### 9.9.3 Signalling overhead reduction for configuration activation

R2-1712257	Signalling Optimization for SCell Configuration and Handover Rel-15 LTE_euCA, LTE_euCA-Core	R2-1710154	Qualcomm Inc	discussion
R2-1713491	Common SCell configuration LTE_euCA-Core	R2-1710999	Nokia, Nokia Shanghai Bell	discussion Rel-15
R2-1713165	Common SCell configuration LTE_euCA-Core	Withdrawn	Nokia, Nokia Shanghai Bell	discussion Rel-15
R2-1713333	Signalling overhead reduction for SCell Configuration Rel-15 LTE_euCA-Core		Huawei, HiSilicon	discussion
R2-1713335	Signalling overhead reduction for SCell (de)Activation Rel-15 LTE_euCA-Core	R2-1710411	Huawei, HiSilicon	discussion

☒ **[100#36][LTE/euCA] Solutions on signalling overhead reduction (Nokia)**

Try to have a unified solution based on the contributions so far.

Intended outcome: Report to the next meeting

Deadline: Thursday 2018-02-08

### 9.9.4 Others

## 9.10 Enhancements on LTE-based V2X Services

*(LTE\_eV2X-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-171740)*

*Time budget: 1 TU*

*Documents in this agenda item will be handled in a break out session*

### 9.10.1 General

*Including incoming LSs, work plan and rapporteur inputs.*

[R2-1712115](#) LS to RAN2 on carrier selection rules for Rel-15 V2X (R1-1719151; contact: Huawei) RAN1  
LS in Rel-15 LTE\_eV2X-Core To:RAN2

Noted

[R2-1712750](#) Reconsideration on sidelink HARQ entity and sidelink process in PC5 CA Huawei, HiSilicon  
discussion Rel-15 LTE\_eV2X-Core  
Huawei: No SL HARQ entity per SL carrier  
Ericsson, Samsung: No problem with keeping the agreement, it is same as UL case.  
=> Noted

[R2-1712117](#) LS to RAN4 on resource selection for Mode-4 sidelink CA (R1-1719159; contact: Intel) RAN1  
LS in Rel-15 LTE\_eV2X To:RAN4 Cc:RAN2  
Samsung: What should be RAN2 impact?  
Intel: No much RAN2 impact foreseen  
=> Noted

[R2-1712155](#) LS on the support of Unicast and Groupcast transmission over PC5 for eV2X (S2-178181; contact: LGE) SA2 LS in Rel-15 LTE\_eV2X, FS\_eV2XARC To:RAN, RAN2  
Cc:SA, SA1, SA3  
ZTE: In Rel-14, destination id is linked with service type. How to realize unicast?  
OPPO: Shares similar question as ZTE and wonders the ID space will be exclusive or overlapped?  
Qualcomm: Nothing is specified for group management. They may configure ID for any group.  
OPPO: Different MAC HD for destination ID between Rel-12 and Rel-14.  
Ericsson: V2X is based on SL and in that sense, it's not new.  
LG: Even though the destination ID is mapped to service id, the application layer can distinguish the receiver/transmitter.  
=> Noted

## 9.10.2 Carrier aggregation (up to 8 PC5 carriers)

Focus should be on RAN2 aspects.

### 1) Handling of the UE with limited Rx chains

- Do we need to introduce a mechanism to sync the selected carrier between Tx and Rx?

[R2-1712745](#) Need of Rx carrier selection for UEs with limited Rx capability Huawei, Qualcomm Incorporated, OPPO, CATT, HiSilicon discussion Rel-15 LTE\_eV2X-Core  
Huawei: In multiple services, the problem becomes severe.

[R2-1713515](#) Sidelink Carrier Selection Criteria for RX Ericsson discussion Rel-15 LTE\_eV2X-Core

Intel: Mismatch between TX and RX is possible issue and how to guarantee the sync between TX and RX (e.g. due to PPPP-CBR, etc.)?

Huawei: We can consider PPPP-CBR and carrier priority in joint manner.

Nokia: Why not select RX carrier based on the existing CBR?

CATT: It may bring the carrier congestion issue.

ZTE: RX carrier selection is the optimization issue

LG: RX should be able to monitor all carriers associated with service type.

OPPO: Rel-14 PPPP-CBR can be simply reused to sync TX and RX.

ZTE: If we consider both PPPP-CBR and carrier priority, how RX knows what TX selects?

Huawei: Let's first discuss and decide if needed to consider limited RX in carrier selection.

Ericsson: Don't want to mandate to monitor certain carrier and it can be left to UE.

LG: For important service (e.g. ITS safety service), that should not happen to miss the packet.

Huawei: For non ITS safety service, it's better to have it.

OPPO: Whether we will have additional optimization beyond Rel-14 PPPP-CBR mechanism?

Supporting companies (Yes, we need enhancement): 5

Supporting companies (No, we don't need it): 7

=> Working Assumption: No enhancement for the limited RX UE in RX&TX carrier selection beyond Rel-14 mechanism.

### 2) Protocol architecture and details for packet duplication

#### 2.1) Packet duplication at PDCP or MAC?

#### 2.2) Specification impacts to be considered?

[R2-1713513](#) Packet duplication for PC5 Ericsson discussion Rel-15 LTE\_eV2X-Core  
Proposal 1 Sidelink packet duplication in LTE is anchored at PDCP.  
=> Agreed

Proposal 2 As for the Uu packet duplication, duplicated sidelink PDCP PDUs are submitted to two different RLC entities and associated to two different logical channels.

ZTE: How many RLC entities should be assigned to duplicated packet?

Ericsson: Only two

LG: Do we have any restriction on the number of duplicated packets? We may not need it.

OPPO: In Rel-15, no strong reason to have too many.

CATT: Agrees with OPPO.

Ericsson: For Uu, only two are supported and it will make UE easier in implementation.

Samsung: Agrees with Ericsson

=> Agreed

Proposal 3 As for the Uu packet duplication, sidelink packet duplication on a single carrier is not supported, i.e. the MAC layer cannot multiplex the two logical channels associated to a duplicate packet into the same HARQ entity.

Lenovo: No restriction

Huawei: Packet duplication is for F-diversity

Samsung, LG: Shares the view with Huawei

=> Agreed

Proposal 4 The LCID(s) that can be used for transmission of one replica of a duplicate packet are reserved, i.e. they cannot be used by non-duplicated packet transmission. RAN2



to discuss whether this LCID(s) for the duplicated packet should be (pre)configured or hard-coded or up to the UE implementation.

CATT: It should be (pre)configured

OPPO: How "up to the UE implementation" works?

Ericsson: Prefer (pre)configuration option

OPPO: Two options, i.e. i) fixed or ii) (pre)configured. What's Ericsson view?

OPPO: Prefer fixed one (simplest one)

LG: No need of reservation. In Rel-14, already somewhat duplication is allowed and the application layer handles duplicated packets.

ITL: Agrees with LG

Samsung: RX UE also needs to know the LCID for the duplicated packet

LG: From TX, it is duplicated in PDCP but from RX, it will detect duplication in application

=> Agreed with FFS (pre)configuration or hard-coded or up to the UE implementation. Option should be worked for both mode3 and mode4.

Proposal 5 (Pre)configuration may indicate the needed reliability for which a packet can be duplicated over the sidelink by the UE.

ZTE: Agrees with Ericsson

Intel: Can we derive the reliability requirement from the service (type)?

Samsung: Agrees with Ericsson

OPPO: Shouldn't we need both reliability information and the associated threshold?

Huawei: Will reliability impact on TX carrier selection. Want to associate reliability to PPPP and it's reluctant to introduce new dimension.

ITL: Agrees with Huawei

Samsung: How to combine them since PPPP is for PDB now?

OPPO: Agrees with Samsung and it should be also backward compatible with Rel-14 V2X

Huawei: No relationship between PPPP and service type

=> Will ask SA2 the possibility to derive reliability information. Will include some background information for packet duplication and the benefits of reliability indication. Includes background information of Rel-14 PPPP.

Proposal 6 In order to properly enable sidelink packet duplication, the AS layer needs to be provided with the reliability value of a packet to be transmitted over the PC5. The LS to SA2 is available in [5].

Proposal 7 (Pre)configuration determines channel conditions (e.g. CBR values) under which sidelink packet duplication can be used by the UE.

#### Agreements

- 1 Sidelink packet duplication in LTE is anchored at PDCP.
- 2 As for the Uu packet duplication, duplicated sidelink PDCP PDUs are submitted to two different RLC entities and associated to two different logical channels.
- 3 As for the Uu packet duplication, sidelink packet duplication on a single carrier is not supported, i.e. the MAC layer cannot multiplex the two logical channels associated to a duplicate packet into the same HARQ entity.
- 4 The LCID(s) that can be used for transmission of one replica of a duplicate packet are reserved, i.e. they cannot be used by non-duplicated packet transmission. RAN2 to discuss whether this LCID(s) for the duplicated packet should be (pre)configured or hard-coded or up to the UE implementation. (FFS (pre)configuration or hard-coded or up to the UE implementation. Option should be worked for both mode3 and mode4.)
- 5 Will ask SA2 the possibility to derive reliability information. Will include some background information for packet duplication and the benefits of reliability indication. Includes background information of Rel-14 PPPP.

[CB600]: LS on Reliability for eV2X (Ericsson, R2-1714131)

[R2-1712942](#) Discussion on activation of Duplication Nokia, Nokia Shanghai Bell discussion Rel-15 LTE\_eV2X-Core

Proposal 1: RAN2 is kindly requested to agree that eNB controls and configures the activation of duplication transmission on multiple carriers for PC5.

LG: How to handle OOC V2X UEs?

Nokia: Via preconfiguration option (like Rel-14)

CATT: For mode3, it's eNB control and for mode4, it's eNB configure.

ITL: How eNB can be aware whether packet duplication is needed or not? Some information from the UE would be required.

Proposal 2: UE should be allowed to autonomously activate duplication transmission on multiple carriers according to eNB configured CBR threshold and among the carriers allowed by the upper layer indication.

=> For mode4 (connected and idle), UE autonomous activation of duplication transmission on multiple carriers is allowed based on (pre)configuration. FFS on UE request to NW for duplication transmission.

Proposal 3: UE may request duplication transmission from eNB if UE cannot activate it autonomously based on eNB configuration, and eNB may respond to UE's request by providing either dedicated mode 4 configurations with different CBR threshold or dedicated mode 3 resource allocation in case eNB determines to accept the request.

**Agreements:**

1. For mode4 (connected and idle), UE autonomous activation of duplication transmission on multiple carriers is allowed based on (pre)configuration. FFS on UE request to NW for duplication transmission.

3) Details of carrier selection

- How to implement PPPP and CBR in carrier selection?

1st step: carriers by upper layer, eNB configuration and UE capability then?

Option1: Narrow down to carriers to allow Tx based on Rel-14 CBR-PPPP table + further narrow down for load-balance

Option2: Narrow down to carriers to meet new CBR-PPPP threshold for each carrier

Option3: Narrow down to carriers to meet lowest CBR measurement for each carrier (PPPP is handled as part of LCP)

[R2-1712178](#) Carrier selection in CA-based eV2x OPPO discussion Rel-15 LTE\_eV2X-Core  
 Huawei: How to reuse PPPP-CBR table?  
 OPPO: One TX resource pool for a given carrier is selected and PPPP-CBR will be applied.  
 Huawei: L1 parameters will be there anyway since CBR ranges for PPPP-CBR covers almost all ranges, which means all carriers will stay as candidate carriers.

[R2-1712751](#) Discussion on the Tx carrier selection for PC5 CA Huawei, HiSilicon discussion Rel-15 LTE\_eV2X-Core  
 Huawei: Carrier selection should be done before resource selection/L1 parameters determination.  
 LG: CR\_Limt can be used for TX carrier selection, so we can reuse the Rel-14 PPPP-CBR

[R2-1712869](#) Layer design aspect for Tx carrier selection LG Electronics Inc. discussion Rel-15 LTE\_eV2X-Core

☒ **[100#41][LTE – eV2X] TX carrier selection – LG**

- Identify the list of solutions by using PPPP and CBR in the TX carrier selection (based on the contributions this meeting)
  - Analyze pros and cons
  - Select the best option / the most preferred option
- Intended outcome: Report to next meeting  
 Deadline: Thursday 2017-02-08

[R2-1712626](#) Remaining aspects of TX Carrier Selection for CA over PC5 Intel Corporation discussion Rel-15 LTE\_eV2X-Core

[R2-1712947](#) Discussion on carrier selection details and handling Rx limited V2X UE Lenovo, Motorola Mobility discussion Rel-15 LTE\_eV2X-Core

<a href="#">R2-1713070</a>	Discussion on carrier selection in PC5 CA	ZTE Corporation	discussion	
<a href="#">R2-1713405</a>	Carrier and resource selection in carrier aggregation for V2X Phase 2	Incorporated	discussion	Rel-15 LTE_eV2X-Core Qualcomm
<a href="#">R2-1713516</a>	Sidelink Carrier Selection Criteria for TX	Ericsson	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712179</a>	Packet duplication in CA-based eV2x	OPPO	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712183</a>	Discussion on Carrier Set Configuration for PC5 CA		OPPO discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712625</a>	Limited RX chain UE considerations for CA over PC5	Intel Corporation	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712627</a>	Discussion on carrier reselection aspects for CA over sidelink		discussion	Rel-15 LTE_eV2X-Core Intel Corporation
<a href="#">R2-1712628</a>	Discussion on packet duplication for V2X CA	Intel Corporation	discussion	Rel-15 LTE_eV2X-Core <a href="#">R2-1710650</a>
<a href="#">R2-1712629</a>	Further considerations on packet duplication for CA based eV2X	Intel Corporation	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712744</a>	Discussion on how to deal with Destination L2 ID during Tx carrier selection		discussion	Rel-15 LTE_eV2X-Core Huawei, HiSilicon
<a href="#">R2-1712745</a>	Need of Rx carrier selection for UEs with limited Rx capability		discussion	Rel-15 LTE_eV2X-Core Huawei, Qualcomm Incorporated, OPPO, CATT, HiSilicon
<a href="#">R2-1712746</a>	Packet duplication for PC5 CA	Huawei, HiSilicon	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712749</a>	On UEs with limited Rx capability in PC5 CA	Huawei, HiSilicon	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712752</a>	Analysis on resource allocation for PC5 CA	Huawei, HiSilicon	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712852</a>	_Issues for carrier selection in CA-based eV2X	CATT	discussion	
<a href="#">R2-1712854</a>	some consideration of Rx limitatoin	CATT	discussion	
<a href="#">R2-1712873</a>	Tx/Rx Carrier selection	LG Electronics Inc.	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712948</a>	Discussion on packet duplication on PC5	Lenovo, Motorola Mobility	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1712970</a>	Packet Duplication for eV2X Sidelink CA	Potevio	discussion	Rel-15
<a href="#">R2-1713071</a>	Consideration on data duplication design for PC5 CA	ZTE Corporation	discussion	
<a href="#">R2-1713072</a>	Discussion on sidelink resource request mechanism for PC5 CA	ZTE Corporation	discussion	
<a href="#">R2-1713512</a>	LS on Reliability Values for eV2X	Ericsson	LS out	Rel-15 LTE_eV2X-Core To:SA2
<a href="#">R2-1713513</a>	Packet duplication for PC5	Ericsson	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1713515</a>	Sidelink Carrier Selection Criteria for RX	Ericsson	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1713707</a>	De-prioritization of duplicated transmission for V2X sidelink communication	LG Electronics Inc.	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1713823</a>	Consideration on packet duplication	LG Electronics Inc.	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1713828</a>	Considerations on sidelink packet duplication	ITL	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1713834</a>	Considerations on operating mode configuration for sidelink CA	ITL	discussion	Rel-15 LTE_eV2X-Core
<a href="#">R2-1713839</a>	Discussion on SPS support with enhanced Carrier Aggregation	Samsung	discussion	<a href="#">R2-1711775</a>
<a href="#">R2-1713841</a>	Packet Duplication for the Sidelink Carrier Aggregation	Samsung	discussion	<a href="#">R2-1711812</a>
<a href="#">R2-1713874</a>	Consideration on Required Reliability for Tx Carrier Selection	Samsung	discussion	

### 9.10.3 Radio resource pool sharing between UEs using mode 3 and mode 4

*Focus should be on RAN2 aspects.*

1) *Scenarios and pool configuration?*

<a href="#">R2-1712180</a>	Resource pool sharing in eV2x	OPPO	discussion	Rel-15 LTE_eV2X-Core
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[R2-1712630](#) Resource pool sharing between mode 3 and mode 4 Intel Corporation discussion  
Rel-15 LTE\_eV2X-Core [R2-1710652](#)

☒ **[100#42][LTE – eV2X] Radio resource pool sharing – OPPO**

- Identify possible scenarios
  - Clarify which scenario we'll take into account for the solution
  - Pool configurations with pool sharing
  - Possible solutions (RAN2 based one)
- Intended outcome: Report to next meeting  
Deadline: Thursday 2017-02-08

2) *Enhancements options?*

[R2-1712747](#) Discussion on resource pool sharing between mode3 and mode4 UEs Huawei, HiSilicon  
discussion Rel-15 LTE\_eV2X-Core

[R2-1713387](#) Resource pool sharing between Mode 3 and Mode 4 Qualcomm Incorporateddiscussion  
Rel-15 LTE\_eV2X-Core [R2-1710682](#)

[R2-1712748](#) On resource pool sharing between R15 UEs and R14 UEs Huawei, HiSilicon discussion  
Rel-15 LTE\_eV2X-Core

[R2-1712846](#) Discussion about exceptional pool for resource pool sharing between UEs using mode 3 and UEs using mode 4 Samsung R&D Institute UK discussion Rel-15 LTE\_eV2X-Core  
[R2-1711733](#)

[R2-1712853](#) Discussion on mode 3 and mode 4 shared resource pool CATT discussion

[R2-1712941](#) Resource pool sharing between mode 3 and mode 4 Nokia, Nokia Shanghai Bell  
discussion Rel-15 LTE\_eV2X-Core

[R2-1712967](#) Discussion on radio resource pool sharing in eV2X Potevio discussion Rel-15

[R2-1713078](#) Consideration on resource pool sharing between UEs using mode 3 and mode 4 ZTE  
Corporation discussion LTE\_eV2X-Core [R2-1711014](#)

[R2-1713514](#) Pool Sharing Between Mode-3 and Mode-4 Ericsson discussion Rel-15  
LTE\_eV2X-Core

[R2-1713748](#) Mode3/Mode 4 resource pool sharing on V2X phase 2 Samsung R&D Institute UK  
discussion [R2-1711754](#) Withdrawn

[R2-1713749](#) Mode 3 behaviour in shared resource pools for V2X phase 2 Samsung R&D Institute UK  
discussion [R2-1711754](#)

[R2-1713750](#) Mode 4 behaviour in shared resource pools for V2X phase 2 Samsung R&D Institute UK  
discussion

[R2-1713751](#) Shared resource pool configuration on V2X phase 2 Samsung R&D Institute UK  
discussion

[R2-1713822](#) Radio resource pool sharing between UEs using mode 3 and UEs using mode 4 LG  
Electronics Inc. discussion Rel-15 LTE\_eV2X-Core [R2-1709133](#)

## 9.10.4 Others

*Including RAN2 aspects, if any, on the WI objectives 1b (64 QAM), 1c (delay reduction at layer 1), 2 (transmit diversity), and 3 (short TTI).*

[R2-1712181](#) Resource selection for sTTI in eV2x OPPO discussion Rel-15 LTE\_eV2X-Core  
[R2-1710149](#)

[R2-1712182](#) Latency reduction in eV2x OPPO discussion Rel-15 LTE\_eV2X-Core

[R2-1712743](#) Consideration on latency related aspects in LTE eV2X Huawei, HiSilicon discussion  
Rel-15 LTE\_eV2X-Core

[R2-1713079](#) Consideration on latency reduction ZTE Corporation discussion LTE\_eV2X-  
Core [R2-1711015](#)

[R2-1713080](#) Discussion on support of 64QAM over sidelink ZTE Corporation discussion  
LTE\_eV2X-Core [R2-1711016](#)

[R2-1713404](#) Latency reduction for packet transmission in eV2X Qualcomm Incorporateddiscussion Rel-  
15 LTE\_eV2X-Core

[R2-1713407](#) Coexistence between Rel-14 and Rel-15 V2X UEs Qualcomm Incorporateddiscussion  
LTE\_eV2X-Core

[R2-1713511](#) Latency reduction for eV2V Ericsson discussion Rel-15 LTE\_eV2X-Core

- [R2-1713670](#) Latency reduction on V2X phase 2 for UEs using Mode 4 discussion [R2-1711744](#) Samsung R&D Institute UK
- [R2-1713759](#) Latency reduction on V2X phase 2 for sidelink SPS UEs discussion Samsung R&D Institute UK
- [R2-1713766](#) Sidelink SPS confirmation for multiple SPS configurations discussion Samsung R&D Institute UK
- [R2-1713824](#) RAN2 aspects regarding support of 64QAM and TX diversity discussion Rel-15 LTE\_eV2X-Core [R2-1711686](#) LG Electronics Inc.

## 9.11 High capacity stationary wireless and 1024 QAM

(LTE\_1024QAM\_DL-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Mar. 18: WID: RP-171738)  
Time budget: 0.5 TU

*Documents in this agenda item will be handled in a break out session*

### 9.11.1 General

*Including incoming LSs, work plan, rapporteur inputs, running CRs*

- R2-1712127 LS on HCS (R1-1719217; contact: Huawei) RAN1 LS in Rel-15 LTE\_1024QAM\_DL  
To:RAN2, RAN4
- Qualcomm would like to know the meaning of "band/band combination"
- => Noted

### 9.11.2 UE capability and potential new categories

- R2-1712899 Support of 1024QAM in TS 36.306 Huawei, HiSilicon CR Rel-15 36.306  
14.4.0 1521 - B LTE\_1024QAM\_DL-Core Revised to R2-1714081
- R2-1714081 Support of 1024QAM in TS 36.306 Huawei, HiSilicon CR Rel-15 36.306  
14.4.0 1521 - B LTE\_1024QAM\_DL-Core
- => Postponed until we received further information on the capability per CC.

### 9.11.3 Corresponding higher-layer procedures and signalling

- R2-1712898 Support of 1024QAM in TS 36.331 Huawei, HiSilicon CR Rel-15 36.331  
14.4.0 3149 - B LTE\_1024QAM\_DL-Core Revised to R2-1714082
- R2-1714082 Support of 1024QAM in TS 36.331 Huawei, HiSilicon CR Rel-15 36.331  
14.4.0 3149 - B LTE\_1024QAM\_DL-Core
- => Postponed until we received further information on the capability per CC.

## 9.12 Enhancements to LTE operation in unlicensed spectrum

(LTE\_unlic-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-170848)  
Time budget: 1 TU

*Documents in this agenda item will be handled in a break out session*

### 9.12.1 General

*Including incoming LSs, work plan, rapporteur inputs, running CRs*

- R2-1714086 Resource allocation for AUL discussion Rel-15 LTE\_unlic-Core

RLC reordering handling:

- Huawei think it is very rare case.

HARQ related topics:

#### Agreements

- 1 Add new separate RRC configurable timer X as follow:
  - When Timer X starts is FFS

- Timer X is stopped if it received SUL grant or HARQ feedback with SUL grant for the retransmission
  - UE shall not retransmit before the timer X stops/expires.
- 2** UE can select the HARQ process for new AUL transmission when the following conditions are fulfilled:
- the HARQ process for the corresponding HARQ process ID is not already being used for AUL (re)transmission in which HARQ ACK feedback has not been received for the HARQ process corresponding to the HARQ process ID
  - The HARQ process ID is not used by a SUL grant unless it has been ACK as agreed in RAN1.

LBT and Logical channel limitation:

- Agreements:**
- 1** Channel access priority for each UL LAA allowed logical channel can be configured via RRC Connection Reconfiguration as part of the Logical Channel Configuration per DRB or all DRBs.
  - 2** For AUL transmission, UE selects the lowest access priority class of the logical channel with MAC SDU multiplexed into the MAC PDU
  - 3** MAC CEs have highest priority access class

## 9.12.2 Autonomous uplink access on Frame structure type 3

HARQ operation:

R2-1712623	HARQ aspects of AUL	Intel Corporation	discussion	Rel-15	LTE_unlic-Core
R2-1712979	Autonomous Uplink HARQ Aspects	Motorola Mobility Germany GmbH	discussion		Rel-15 LTE_unlic-Core
R2-1713519	Coexistence Between AUL and Dynamically Scheduled UL Grants	Ericsson	discussion		Rel-15 LTE_unlic-Core
	=> The issue is confirmed and the solution should be discussed.				
R2-1713520	HARQ Retransmissions for Autonomous UL Access	Ericsson	discussion		Rel-15 LTE_unlic-Core
R2-1713883	HARQ process ID calculation for SPS with SkipULTx	LG Electronics UK	discussion		LTE_unlic-Core
	=> Noted				
R2-1713815	Further details of Autonomous Uplink Access for eLAA	Qualcomm Incorporated	discussion		

Other MAC:

R2-1712624	Other MAC aspects of AUL Core	Intel Corporation	discussion	Rel-15	LTE_unlic-Core
R2-1712896	Other MAC aspects of AUL Core	Huawei, HiSilicon	discussion	Rel-15	LTE_unlic-Core R2-1710365

AUL confirmation:

R2-1713521	On AUL Confirmation	Ericsson	discussion	Rel-15	LTE_unlic-Core
R2-1712893	Confirmation on AUL activation and deactivation	Huawei, HiSilicon	discussion		Rel-15 LTE_unlic-Core R2-1710363
R2-1713646	Necessity of multi bit confirmation MAC CE	LG Electronics Inc.	discussion		LTE_unlic-Core
R2-1713198	Autonomous Uplink Access details	Nokia, Nokia Shanghai Bell	discussion		Rel-15 LTE_unlic-Core
R2-1712895	Issues on RLC reordering with AUL	Huawei, HiSilicon	discussion	Rel-15	LTE_unlic-Core

BS and PH

R2-1712894	Issues on BS and PH calculation for AUL	Huawei, HiSilicon	discussion	Rel-15	LTE_unlic-Core R2-1710366
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R2-1713493 Miscellaneous MAC Issues for feLAA Ericsson discussion Rel-15 LTE\_unlic-Core

AUL configuration:

R2-1713517 AUL configuration for feLAA Ericsson discussion Rel-15 LTE\_unlic-Core

Channel Access Priority:

R2-1713518 Channel Access Priority Classes for feLAA Ericsson discussion Rel-15 LTE\_unlic-Core

### 9.12.3 Other operation on Frame structure type 3

R2-1713522 RAN2 Impact on Multiple Starting and Ending Positions in a Subframe Ericsson  
discussion Rel-15 LTE\_unlic-Core

### 9.12.4 Others

## 9.13 Further NB-IoT enhancements

*(NB\_IOTenh2-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18; WID: RP-172063)*

*Time budget: 2 TU*

*Documents in this agenda item will be handled in a break out session*

*Some sub-items in 9.13 and 9.14 may be treated jointly.*

*For WI objectives A-1 to A-5, the following approach has been concluded by RAN WG chairs for providing the "complete running CRs/draft CRs to RAN#78":*

*a/ Draft/running CRs for the prioritised features are endorsed by the RAN WGs as being complete*

*b/ The CRs are attached for information in an LS to RAN*

*c/ The CRs are referenced in the status report to demonstrate the objectives have been met*

*d/ RAN WGs do not provided the CRs to RAN as agreed or technically endorsed*

### 9.13.1 Organisational

*Including incoming LSs, rapporteur inputs, running CRs*

#### LS in

R2-1712122 LS on wake-up signal configuration and procedures for NB-IoT and BL/CE UEs in Rel-15 (R1-1719207; contact: HiSilicon) RAN1 LS in Rel-15 LTE\_eMTC4, NB\_IOTenh2  
To:RAN2  
- We should reply  
⇒ **Noted**

R2-1712142 Reply LS on measurement accuracy improvement (R4-1711893; contact: Huawei) RAN4 LS in Rel-15 NB\_IOTenh2-Core To:RAN1 Cc:RAN2  
⇒ **Noted**

R2-1714168 LS on Wake-up signal features for Rel-15 LTE-MTC (R1-1721282; contact: Ericsson)  
- QC think it is strange that the WA are identical. Ericsson cannot explain.  
⇒ **Noted**

R2-1714151 LS on wake-up signal (R1-1721241; contact: HiSilicon)  
- ZTE wonders if this means that we have one WUS per PO. Hisilicon clarifies that the exact mapping has not been agreed.  
⇒ **Noted**

#### Draft CRs

R2-1713197 Running 36.304 CR for Further NB-IoT enhancements Nokia, Nokia Shanghai Bell  
draftCR Rel-15 36.304 14.4.0 B NB\_IOTenh2-Core

R2-1713690 Introduction of further NB-IoT enhancements in 36.306 Ericsson CR Rel-15  
36.306 14.4.0 1513 1 B NB\_IOTenh2-Core R2-1710742  
*Above 2 docs not treated*

R2-1713691 Introduction of further NB-IoT enhancements in 36.322 Ericsson CR Rel-15  
36.322 14.1.0 0131 1 B NB\_IOTenh2-Core R2-1710743  
- Should be a DraftCR  
⇒ **Contents agreed, revise to DraftCR, provide with LS to RP**  
⇒ **DraftCR in R2-1714005**

R2-1714005 Introduction of further NB-IoT enhancements in 36.322 Ericsson draftCR Rel-15  
36.322 14.1.0 B NB\_IOTenh2-Core R2-1710743  
⇒ **Endorsed unseen**

General:

⇒ **We will prepare an LS for RP, with attached DraftCRs (one per TS).**

☒ **[100#10][NB-IoT R15] Email discussion one week, running Rel-15 36.331 CR for NB-IoT and LS to RP (Huawei)**

Intended outcome: Endorsed running CR and approved LS

Deadline: Thursday 2017-12-07

=> The running CR is endorsed in R2-1714272, the LS is approved in R2-1714258

☒ **[100#11][NB-IoT R15] Email discussion one week, running Rel-15 36.321 CR for NB-IoT (Ericsson)**

Intended outcome: Endorsed running CR

Deadline: Thursday 2017-12-07

=> Endorsed as a running CR in R2-1714262

R2-1713993 Draft LS on Rel-15 NB-IoT work progress Huawei  
- Nokia wonders what to state on the other features. Huawei think that we report as usual on these on the WI SR.  
⇒ **Change “RAN2 has captured the following enhancements” to “RAN2 has captured progress on the following WI objectives”. Otherwise the contents seems agreeable**  
⇒ **For email approval, Add to email discussion for the Rel-15 RRC Running CRs.**

## 9.13.2 Early Data Transmission

*Early Data transmission for NB-IoT is treated jointly with MTC under AI 9.14.2. Do not use this AI for any item that can be discussed jointly.*

## 9.13.3 System Acquisition Enhancements

*System acquisition Enhancements for NB-IoT is treated jointly with MTC under AI 9.14.3. Do not use this AI for any item that can be discussed jointly.*

*Moved from 9.14.3*

R2-1713192 Introduction of additional SIB1-NB transmissions in 36.331 Huawei, HiSilicon draftCR Rel-15  
36.331 14.4.0 B NB\_IOTenh2-Core  
- R1 may have draftCR for this, and we need this to be reflected in R2 CR as well.  
⇒ **Merged into the 36.331 Running CR**

## 9.13.4 Relaxed Monitoring for cell reselection

*Relaxed monitoring for cell reselection for MTC and NB-IoT is treated jointly under this AI. Including output of email discussion [99bis#35][NB-IoT/MTC] Relaxed Monitoring (Ericsson)*



R2-1713010 Email report 99bis\_35 Relaxed Monitoring Ericsson report Rel-15 NB\_IOTenh-Core, LTE\_eMTC4-Core  
DISCUSSION

P1:

- Nokia think we don't need this standardized periodic measurements. This can be left to UE implementation. Huawei agrees and don't understand how the network can configure certain values. Mediatek think is it ok to not specify this. Nokia think the purpose of relaxed monitoring is to not measure. Ericsson think this cannot be left to UE implementation.
- LG are ok with proposal 1. QC also think proposal 1 is ok as it will anyway be difficult to agree on a value. Huawei wonders why this would need to be configurable. LG think the configuration could be changed. ZTE think that a hardcoded value is sufficient. Huawei want to know how to configure.
- Ericsson think we have already agreed to do this, and there are two different aspects a) whether it is standardized, b) whether the period is configurable. Ericsson think we should only discuss b) Sierra Wireless agrees.
- SW think 24h would be acceptable.

P2

- Nokia think something is missing
- Understanding of the proposed mechanism:  
Detection of a drop serving cell signal strength.
  - o RSRP (serving cell) is stored in *REFrxlev*, FFS exactly when this happens (Alt1: at cell reselection/NB cell measurement trigger, Alt2: periodically but only store the value if stronger than previous).
  - o *REFrxlev* is compared to measured RSRP (serving cell), if the difference is  $> \text{RSRP delta}$  then: perform NB cell measurements and cell reselection evaluation (or does the UE exit "relaxed monitoring")
- Huawei think that we can have a mechanism that is significantly simpler than for GSM.
- Nokia think that we can have an absolute threshold. Chair think we have already discarded such mechanism. Nokia wonders if mobility can be detected by change in RSRP. Nokia think that a time scale is needed.
- Nokia think we have three different states: Normal monitoring, relaxed monitoring, and no monitoring (as today triggered by S threshold).
- Gemalto point out that the RSRP change is not very linear. We need to think about the delta.
- ZTE think we could follow the GSM approach and define a range rather than a value and the selection of the value is up to the UE.
- Sierra Wireless think that setting this value is not easy, especially since *Srxlev* relates very differently to physical movement in different geometry.
- LG think it can be hardcoded to 6dB.
- Gemalto think it is not clear what the 6dB means, in light of UE measurement accuracy. QC think that the accuracy limitations is somewhat systematic so for comparing measurements it is not so bad.

P3:

- Huawei wonders where the value 10 comes from.
- Gemalto think that we need to avoid slow lowering of *REFrxlev*.

P5:

- Gemalto think that stationary devices could benefit from specific configuration. Ericsson agrees and think that a signalled solution is needed as backup. Nokia think that the mechanism already proposed is sufficient. Sierra Wireless think that it will work for truly stationary devices the way it currently is. Huawei agrees.
- Chair: not that much support for additional mechanism for truly stationary devices.

*Chair's suggests to discuss the following proposals (replacing P3 above):*

For a UE that uses Relaxed Monitoring:

Proposal 3.1: Relaxed Monitoring Requirements for neighbour cell detection and measurements are applied when the following conditions both apply:

- a)  $Srxlev.Ref - Srxlev < Srxlev.Delta$
- b) *FFS criterion* since  $Srxlev.Ref - Srxlev < Srxlev.Delta$  last became false

(where b is a condition to stay in mobile state for a while when stationary/relaxed state has been left)

Proposal 3.2: The *FFS criterion* in condition b) is

- i) X Cell Reselection Evaluations ( $X=10?$ ) has been performed

Proposal 3.3: The *Srxlev.Ref* is a stored *Srxlev* value. The UE sets *Srxlev.Ref* = *Srxlev* when any of the following conditions apply (R2 to choose):

- 1) When a new serving cell has been selected or reselected to
- 2) When cell reselection evaluation is triggered.
- 3) When Condition b becomes applicable, i.e. when UE goes back to stationary/relaxed state.
- 4) Whenever  $Srxlev > Srxlev.Ref$

#### FURTHER DISCUSSION

- Huawei think that 3.1.a and 3.3.1 is the bare minimum that is needed.
- Gemalto wonders how often this is evaluated and whether this need to be applicable to a certain time. Chair think that consolidation of measurements can indeed be discussed but would like to first focus on the basic mechanism.
- Nokia wonders whether the UE would perform normal measurements when condition 3.1.a is not met. Chair think this is the proposal from all the CRs.
- QC think we might need to consider more exactly when measurements are being done. Maybe UE need to detect and measure then entering a new cell. Mediatek think that it just allows the UE to relax the measurements and the UE can measure in any case.
- Gemalto think that more conditions need.
- LG think that 3.3.4 is needed and think that 3.3.1 need to be updated to work. ZTE agrees. Sierra Wless agrees that 3.3.4 is needed and think that reset should also be done at 3.3.2. Nokia agrees with Sierra Wireless.
- Chair think that only 3.1.a and 3.3.1 is not sufficient, e.g. a UE that initializes *Srxlev* in good coverage, moves to worse coverage and becomes stationary there would not enter the relaxed monitoring. Gemalto agrees.
- QC think that only 3.3.4 doesn't work as this only increases the Reference to a higher value.
- MTK think that the update need to be able to decrease and increase the reference value.
- Ericsson and Huawei now think that the feature should only target cases where the UE is truly stationary. Sierra wireless think that a UE that goes stationary next to a cell border will anyway do cell reselection based on the timer.
- LG think that there may be changes in the environment that causes fluctuations in the signal strength measurements.
- SW anyway think that some additional criterion for updating *Srxlev.Ref* is needed.
- Veolia disagrees with the hard-coded 24h value abut can accept if this means there can be Rel-14 CRs.

⇒ **Relaxed Monitoring Requirements for neighbour cell detection and measurements are applied when the following condition apply  $Srxlev.Ref - Srxlev < Srxlev.Delta$ . Otherwise the UE perform neighbour cell detection and measurements according to current requirements.**

⇒ **The UE sets  $Srxlev.Ref = Srxlev$  when a new serving cell has been selected or reselected to.**

⇒ **When the UE applies relaxed monitoring, there will be periodic triggering of neighbor cell detection and measurements, and the period is hardcoded to 24h**

⇒ **The RSRP delta value range is {dB6, dB9, dB12, dB15} dB with default 6 dB**

⇒ **All UEs capable of relaxed monitoring can apply it in cells where it is configured by broadcast signalling.**

R2-1713765 Relaxed monitoring in NB-IoT and MTC LG Electronics Inc. discussion Rel-15

- A main point is that RSRP can change quite a lot also for stationary UEs, e.g. due to moving obstacles.
- P1: Huawei think that this is not needed. The UE can already filter measurements, based on freedom / flexibility in the standard. LG think that the P3 from the email discussion wasn't sufficient.

- P2: Nokia think this anyway need to be clear. Ericsson think that it is not nessecary but think that inter-frequency is most important. QC agrees.

⇒ **Relaxed monitoring applies to both intra-frequency and inter-frequency.**

- R2-1713011 Relaxed Monitoring in MTC Ericsson discussion Rel-15 LTE\_eMTC4-Core
- Nokia think that in general we should follow the WI and have this in Rel-15. Huawei agrees that we should have this in Rel-15. LG also agrees.
  - Ericsson wonders whether this could be a Rel-15 early implementable feature. Huawei are OK with that.

⇒ **Introduce relaxed monitoring for UE that are Cat M1 M2 or are capable of CE.**

- R2-1713012 Relaxed Monitoring in NB-IoT Ericsson discussion Rel-15 NB\_IOTenh-Core
- ⇒ **Noted**

- R2-1713082 Introduction of relaxed monitoring for NB-IoT in 36.304 Huawei, HiSilicon CR Rel-14 36.304 14.4.0 0384 2 C NB\_IOTenh-Core, TEI14 R2-1711321

⇒ **Merged with R2-1713013**

- R2-1713083 Introduction of relaxed monitoring for NB-IoT in 36.306 Huawei, HiSilicon CR Rel-14 36.306 14.4.0 1492 2 C NB\_IOTenh-Core, TEI14 R2-1711322

⇒ **Merged with R2-1713014**

- R2-1713084 Introduction of relaxed monitoring for NB-IoT in 36.331 Huawei, HiSilicon CR Rel-14 36.331 14.4.0 2987 2 C NB\_IOTenh-Core, TEI14 R2-1711323

⇒ **Merged with R2-1713015**

- R2-1713812 Relaxed monitoring in NB-IoT in 36.304 LG Electronics CR Rel-15 36.304 14.4.0 0400 - B NB\_IOTenh2-Core

⇒ **Merged with R2-1713013**

- R2-1713814 Relaxed monitoring in NB-IoT in 36.331 LG Electronics CR Rel-15 36.331 14.4.0 3198 - B NB\_IOTenh2-Core

⇒ **Merged with R2-1713015**

- R2-1713013 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.304 14.4.0 0392 - B NB\_IOTenh-Core

⇒ **revised**

- R2-1713014 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.306 14.4.0 1523 - B NB\_IOTenh-Core

⇒ **revised**

- R2-1713015 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.331 14.4.0 3154 - B NB\_IOTenh-Core

⇒ **revised**

- R2-1713085 Introduction of relaxed monitoring for efeMTC in 36.304 Huawei, HiSilicon draftCR Rel-15 36.304 14.4.0 C LTE\_eMTC4-Core

- R2-1713086 Introduction of relaxed monitoring for efeMTC in 36.306 Huawei, HiSilicon draftCR Rel-15 36.306 14.4.0 C LTE\_eMTC4-Core

- R2-1713087 Introduction of relaxed monitoring for efeMTC in 36.331 Huawei, HiSilicon draftCR Rel-15 36.331 14.4.0 C LTE\_eMTC4-Core

- R2-1713016 Introduction of relaxed monitoring in MTC Ericsson CR Rel-14 36.304 14.4.0 0393 - B LTE\_eMTC4-Core

- R2-1713017 Introduction of relaxed monitoring in MTC Ericsson CR Rel-14 36.306 14.4.0 1524 - B LTE\_eMTC4-Core

- R2-1713023 Introduction of relaxed monitoring in MTC Ericsson CR Rel-14 36.331 14.4.0 3155 - B LTE\_eMTC4-Core

*Above 6 tdocs not treated*

⇒ **We expect MTC solution to be identical to the NB-IoT solution, so no specific MTC CRs are needed at this meeting.**

Offline (308), revisions of NB-IoT Rel-14 CRs in R2-1713987,88,89. (NOTE that the solution is intended to be common for NB-IoT and MTC). (Ericsson)

- Nokia are ok with the CRs

- Ericsson and Huawei think that by relaxed monitoring also the cell detection requirements are not applied so we don't need to mention that anywhere
  - QC think we should say on the cover sheets that the impact is measurements for cell reselection
  - LG think we don't need cover sheet change.
  - "draft" need to be removed from the tdoc numbers
  - LG think this works for stationary UEs, but other cases not clear.
- ⇒ **On the coversheets, remove "draft", add "for cell reselection" or "Idle mode" etc.**

- R2-1713987 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.304  
 14.4.0 0392 1 B NB\_IOTenh-Core  
 - Kyocera point out that the unit for rxlev is dBm and not dB. Huawei think dB is correct as this is a difference between measured value and min value.  
 ⇒ **revised**
- R2-1713988 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.306  
 14.4.0 1523 1 B NB\_IOTenh-Core  
 ⇒ **revised**
- R2-1713989 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.331  
 14.4.0 3154 1 B NB\_IOTenh-Core  
 - QC think that Optionality and presence in ASN.1 should be modified. Ericsson agrees.  
 ⇒ **Revised, Update ASN.1**

Revisions in R2-1714002, 03, 04 (Ericsson)

- R2-1714002 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.304  
 14.4.0 0392 2 B NB\_IOTenh-Core  
 ⇒ **agreed**
- R2-1714003 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.306  
 14.4.0 1523 2 B NB\_IOTenh-Core  
 ⇒ **agreed**
- R2-1714004 Introduction of relaxed monitoring in NB-IoT Ericsson CR Rel-14 36.331  
 14.4.0 3154 1 B NB\_IOTenh-Core  
 - Ericsson explains that there is a missing "-NB" that need to be added in ASN.1  
 ⇒ **Revised in R2-1714210, which is agreed unseen**

### 9.13.5 Semi-Persistent Scheduling

- R2-1712330 Consideration on SPS for SC-PTM in FeNB-IoT ZTE Corporation, Sanechips discussion  
 Rel-15 NB\_IOTenh2-Core
- R2-1713416 NB-IoT and SPS Ericsson discussion Rel-15 NB\_IOTenh2-Core
- R2-1713504 NB-IoT Idle mode SPS for M2M regular reporting MediaTek Beijing Inc. discussion Rel-15
- R2-1713653 Further consideration on SPS for NB-IoT LG Electronics Inc. discussion Rel-15  
 NB\_IOTenh2-Core R2-1711572

### 9.13.6 RRC Connection Release Enhancements

*Including output of email discussion [99bis#36][NB-IoT] RRC release enhancements (QC)*

- R2-1712295 Email discussion report: [99bis#36][NB-IoT] RRC release enhancements Qualcomm  
 Incorporated discussion Rel-15 NB\_IOTenh2-Core  
 P1
- Ericsson think that proposal 1 is already supported. LG disagrees. R13 UE has to wait 10s time. Huawei think that in RRC it is clear that there is a 10s waiting time.
  - LG think that proposal 1 involves additional wait as the UE doesn't know if the HARQ feedback is successful.
  - Nokia wonders if the intention is to have one mechanism or multiple mechanisms. Nokia prefers to have only one mechanism. MTK think that timer based release is complementary and can still be considered a fallback.

- Intel think that P1 is already agreed (kind of), but would like to change immediate to be up to UE implementation.
- LG think that UE can go to idle immediately if DRX is configured.
- Nokia would like to know if the eNB need to know whether the UE waits or not.

P1.1/1.2

- QC think yes. LG agrees with these proposals.
- Nokia think this is not in the WID for eMTC so it should be only for NB-IoT. Huawei agrees.
- Gemalto are ok with Rel-14. Veolia support Rel-14. Nokia are ok as well for NB-IoT.
- Ericsson think we should have a magic sentence. Nokia think

P2

- LG think there is significant specification impact. QC think that specification changes is not so costly if you consider that there will be gains for very long time.
- Show of hands
  - o Yes: 3
  - o No: 6

Veolia proposes to anyway keep this open for Rel-15.

Chair think that in any case, there will be no further discussion time allocated to clarify technical details. If proponents manages to convince a majority we could possibly have this.

P3

- QC wonders how the UE can differentiate between different cases.
- Nokia supports this.
- QC think that this is a new timer.
- Ericsson think that whether NAS recovery is triggered or not need to be configured by RRC, but think this could either be the existing timer or a new timer.
- Docomo think we should define a new mechanism, i.e. a new timer.
- Intel think that the new timer would not work with the existing timer and that there is a lot of specification work. Ericsson explains that the two timers are not intended to be configured together.
- MTK think that the timer could be the existing timer and think that it is good to have this as fallback.
- QC clarifies that the timer has different start and expiry conditions.
- Show of hands in two steps:
  - o Step 1
    - Existing timer (same start/stop/expiry cond with other cause value): 5  
(Where the other cause value will not trigger NAS recovery)
    - New timer (modified start/stop/expiry cond): 2
  - o Step 2
    - Timer 5
    - No Timer 5

- ⇒ **Confirm that the UE is required to send the HARQ Ack at reception of the RRC Connection Release Message before going to Idle.**
- ⇒ **Thus the main modification for reception of RRC connection release without RLC AM poll is to clarify that the UE can go to Idle immediately after sending HARQ ack without any waiting time.**
- ⇒ **Introduce the clarification above for NB-IoT Rel-14.**
- ⇒ **We don't support the DCI based RRC connection release for Dec 2017.**
- ⇒ **We don't support timer based release without NAS recovery.**

Comeback. Nokia want to check whether magic sentence is ok for the Rel-14 CR.

- After checking Nokia confirms it is ok.

R2-1712296	Further input on RRC Connection Release via PDCCH DCI discussion	Rel-15 NB_IoTenh2-Core	Qualcomm Incorporated
R2-1712329	Remaining issues for quick release of RRC connection in FeNB-IoT	Sanechips discussion Rel-15 NB_IoTenh2-Core	ZTE Corporation,
R2-1713024	Quick RRC connection release	Ericsson discussion	Rel-15 NB_IoTenh2-Core
R2-1713025	Introduction of timer based release	Ericsson CR	Rel-15 36.306 14.4.0 1525
-	B NB_IoTenh2-Core		

R2-1713026	Introduction of timer based release	Ericsson	CR	Rel-15	36.321	14.4.0	1197
	- B NB_IOTenh2-Core						
R2-1713027	Introduction of timer based release	Ericsson	CR	Rel-15	36.331	14.4.0	3156
	- B NB_IOTenh2-Core						

*Above 6 tdocs not treated*

R2-1713028	Successful acknowledgement of RRCConnectionRelease	Ericsson	CR	Rel-14			
	36.331 14.4.0 3157 - F NB_IOTenh-Core						
	- Huawei think this should not be a NOTE.						
	⇒ <b>revised</b>						
R2-1713994	Successful acknowledgement of RRCConnectionRelease	Ericsson	CR	Rel-14			
	36.331 14.4.0 3157 - F NB_IOTenh-Core						
	⇒ <b>agreed</b>						
R2-1713193	Introduction of RRC Connection Release enhancements	Huawei, HiSilicon		draftCR Rel-15	36.331	14.4.0	B NB_IOTenh2-Core
	- Chair wonders why we don't say clearly that we mean RLC poll.						
	⇒ <b>Merged w above</b>						

### 9.13.7 UE differentiation

R2-1713029	Way forward UE differentiation	Ericsson, Vodafone	discussion	Rel-15	NB_IOTenh2-Core		
	- Chair wonders to what extent we should discuss the detailed mechanism.						
	- Vodafone think that the main points of this is a) the eNB can learn parameters b) there is additional useful info remaining UE battery life.						
	- Huawei think we shall wait for SA2. Huawei think we didn't agree on the remaining battery life information in R2.						
	- LG think we can consider remaining battery life and think that P2 is R3 scope. LG think we can wait for SA2.						
	- Nokia wonders what this info shall be used for. Vodafone think it can be considered in the scheduler, etc.						
	- QC would like to understand how the remaining battery life can be calculated. Vodafone think that for IoT devices it is easy and can be based on history. It would be up to operator to decide how to interpret this.						
	- Ericsson think that the list we provided was also preliminary and didn't have sufficient details. More work is needed but think we anyway can add this information.						
	- LG think we need input from SA2.						
	- Veolia think this is interesting, but do not think this should be interpreted as a proposal opposing previous information. Veolia would be ok with this.						
	- Huawei, LG and Nokia opposes this.						
	⇒ <b>Noted</b>						
	Comback Friday						
	- Ericsson explains that this has been discussed in SA2 and based on LS there will be opportunity to further discuss this at later meeting.						

R2-1713030	DRAFT LS on UE differentiation in NB-IoT	Ericsson	LS out	Rel-15	NB_IOTenh2-Core		
	To:RAN3 SA2 Cc:CT1						

### 9.13.8 TDD

*Including output of email discussion [99bis#34][NB-IoT] Timer impact of TDD (Ericsson)*

R2-1713358	Email discussion report on Timer impact of TDD	Ericsson	report	Rel-15			
R2-1713195	System information scheduling in TDD mode	Huawei, HiSilicon, Neul	discussion	Rel-15	NB_IOTenh2-Core		
R2-1713196	Paging and random access for TDD mode	Huawei, HiSilicon, Neul	discussion	Rel-15	NB_IOTenh2-Core		
R2-1713360	MIB, SIBs and Paging for NB-IoT TDD	Ericsson	discussion	Rel-15			

## 9.13.9 Wake Up Signal

*Wake Up Signal etc for MTC and NB-IoT is treated jointly under this Agenda Item.  
Including output of email discussion [99bis#37][NB-IoT/MTC] WakeUp Signal (Huawei)*

- R2-1713186 Report of email discussion [99bis#35][NB-IoT MTC] on wake-up signal Huawei report Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core  
BREIF DISCUSSION
- On UE grouping: Chair think feasibility is not the problem. Ericsson think benefit is also part of the question. QC think we can respond on the feasibility and indicate something on usefulness. Intel think grouping is useful. Nokia think paging UE grouping is sufficient. LG think UE grouping is feasible if we follow e.g. PI grouping in WCDMA.
  - Concerns on grouping: Ericsson think that WUS need to contain more information of grouping is supported and there is then a risk that WUS is longer. ZTE agrees. QC think the length is a R1 problem.
  - QC think we need to explain feasibility and can leave the decision to R1. Hisilicon and Intel agrees.
  - Ericsson point out that we have not agreed on a solution and there are many details to decide on before the whole thing can be agreed. Ericsson think that the grouping must be configurable. QC wonders what is configurable but think that UE groups per WUS indeed need to be configurable.
  - Chair think that indeed configurability need to be discussed if further grouping is agreed and think there are several possibilities
    - o 1 WUS per PO
    - o Multiple WUS per cell-level-PO (subgrouping of UEs)
    - o Multiple PO per WUS
- P5
- Intel wonders how to disable quickly
  - Nokia and QC think this is just SI update. LG think this may increase power consumption.
  - Ericsson think that the MME should not need to know about the WUS. Sony support the concern of Ericsson.
  - Intel think that MME might need to know something.
- ⇒ **It is FFS if the use of wake-up signal for paging is enabled/disabled via system information in NB-IoT. Also in MTC if enabling/disabling is agreed in RAN1.**
- R2-1713187 Draft reply LS to RAN1 on wake-up signal Huawei LS out Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core To:RAN1
- Ericsson think we need to discuss properly. Nokia think it wouldn't even work to have one WUS per PTW, as the consequence of WUS detection failure would be severe.
  - Chair wonders why R2 would make performance evaluations.
  - This seems to be a time consuming discussion. We will do this later.
  - ZTE think the second bullet easier to meet than the first ..
- ⇒ **RAN2 could not agree on the feasibility to apply one wake-up signal to multiple POs in a PTW. It would need further discussions to reach an agreement in R2.**
- ⇒ **In the LS remove the second bullet.**
- ⇒ **Revised in R2-1714006**
- R2-1714006 Draft reply LS to RAN1 on wake-up signal Huawei LS out Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core To:RAN1
- ⇒ **Approved, final version in R2-1714008**
- R2-1712297 Wakup signal considerations Qualcomm Incorporated discussion Rel-15 LTE\_eMTC4-Core, NB\_IOTenh2-Core
- R2-1713033 Wake-up signal for NB-IoT & eMTC Ericsson discussion Rel-15 NB\_IOTenh2-Core
- R2-1712334 Further consideration on wake-up signal ZTE Corporation, Sanechips discussion Rel-15 LTE\_eMTC4-Core, NB\_IOTenh2-Core
- R2-1712993 WUS aspects on grouping and mobility for feMTC and feNB-IoT Sony discussion Rel-15 NB\_IOTenh2-Core

R2-1713034	Introduction of Wake Up Signal in NB-IoT	Ericsson	CR	Rel-15	36.302	14.3.0	0118
-	B NB_IOTenh2-Core						
R2-1713035	Introduction of Wake Up Signal in NB-IoT	Ericsson	CR	Rel-15	36.304	14.4.0	0394
-	B NB_IOTenh2-Core						
R2-1713036	Introduction of Wake Up Signal in NB-IoT	Ericsson	CR	Rel-15	36.306	14.4.0	1526
-	B NB_IOTenh2-Core						
R2-1713037	Introduction of Wake Up Signal in NB-IoT	Ericsson	CR	Rel-15	36.331	14.4.0	3158
-	B NB_IOTenh2-Core						

Above 8 tdocs not treated

R2-1713784	Issues on Wake-Up Signal for NB-IoT	LG Electronics Inc.	discussion	Rel-15			
	NB_IOTenh2-Core	Withdrawn					

## 9.13.10 Other

*E.g. Support for RLC-UM, Support for physical layer SR, Measurement Accuracy Enhancements, NPRACH reliability, NPRACH range, small cell support, other*

### RLC UM

R2-1713956	Introduction of RLC UM in 36.331	Huawei, HiSilicon	draftCR	Rel-15	36.331	14.4.0	
	NB_IOTenh2-Core	B					
-	RLC need to be updated, as it states that for NB-IoT RLC-UM is just for SC-PTM						
-	Huawei think we need to discuss the SN length, 5bits, 10bits? LG think that if we just applied the two lengths of LTE we don't need to discuss. Huawei think 10bits is enough. QC think that we can have the same SN length as AM, which is 10 bits. LG think that if we use 5bits we can reduce the header size by 1 byte.						
-	QC wonders if all IEs are mandatory. Huawei think they are extensions.						
-	QC wonders is not just bidirectional is sufficient. Huawei just imported from LTE.						
-	LG wonders if this is just for DRB. Huawei confirms this is only for DRB.						
-	FFS if we use 5bit/10bit SN or just 10bit SN						
-	FFS if we support unidirectional						
⇒	<b>With FFSes above (in editor notes), the CR content is agreed.</b>						
⇒	<b>To be merged into 36.331 NB-IoT running CR, which is for email approval</b>						

### High Quality Criterion

R2-1713031	High quality criterion in NB-IoT	Ericsson	discussion	Rel-15	NB_IOTenh2-Core		
R2-1713032	DRAFT LS on high quality signal threshold in NB-IoT and EC-GSM	Ericsson			LS out	Rel-15	
	NB_IOTenh2-Core	To:RAN4 RAN6 Cc:CT1					

### SR enhancements

R2-1712331	Consideration on SR and PHR transmission enhancement in FeNB-IoT	ZTE Corporation, Sanechips	discussion	Rel-15	NB_IOTenh2-Core		
R2-1713417	NB-IoT PHY Scheduling Request	Ericsson	discussion	Rel-15	NB_IOTenh2-Core		
R2-1713418	DRAFT LS on dedicated PHY SR signal for Rel-15 NB-IoT	Ericsson			LS out	Rel-15	
	NB_IOTenh2-Core	To:RAN1					

### Power saving other

R2-1712199	Stopping contention resolution timer based on retransmission scheduling	LG Electronics Inc.	discussion	Rel-15	36.321	NB_IOTenh2-Core	R2-1711343
R2-1712205	Stopping contention resolution timer based on retransmission scheduling	LG Electronics Inc.	CR	Rel-15	36.321	14.4.0	1158 2 F LTE_eMTC4-Core, NB_IOTenh2-Core
							R2-1711344
R2-1712332	Consideration on further UE power consumption reduction in FeNB-IoT	ZTE Corporation, Sanechips	discussion	Rel-15	NB_IOTenh2-Core		
R2-1713018	Dynamical adjustment for NPDCCH period in RRC_CONNECTED for UE power saving	ZTE Corporation, Sanechips	draftCR	Rel-15	36.331	14.4.0	B NB_IOTenh2-Core
R2-1713019	Dynamical adjustment for NPDCCH period in RRC_CONNECTED for UE power saving	ZTE Corporation, Sanechips	draftCR	Rel-15	36.306	14.4.0	B NB_IOTenh2-Core



- R2-1713022 Cell measurement optimization during PRACH procedure for UE power saving ZTE Corporation, Sanechips draftCR Rel-15 36.331 14.4.0 B NB\_IOTenh2-Core  
 R2-1713045 Cell measurement optimization during PRACH procedure for UE power saving ZTE Corporation, Sanechips draftCR Rel-15 36.321 14.4.0 B NB\_IOTenh2-Core

### RACH reliability and range

- R2-1713419 NPRACH reliability and range enhancement for NB-IoT Ericsson discussion Rel-15 NB\_IOTenh2-Core

### Small Cell

- R2-1713194 Small cell support in NB-IoT Huawei, HiSilicon, Neul discussion Rel-15 NB\_IOTenh2-Core  
 R2-1712961 2-Step RACH support for Small Cells Gemalto N.V. discussion  
 R2-1712283 Further Consideration of NB-IoT Small Cell Support Telekom R&D Sdn Bhd discussion Rel-15

### Access Barring CE level

- R2-1713756 Access barring for CE level in feNB-IOT LG Electronics Inc. discussion Rel-15 R2-1711638

*Withdrawn*

- R2-1712234 Further Consideration of NB-IoT Small Cell Support Telekom R&D Sdn Bhd discussion Rel-15

## 9.14 Even further enhanced MTC for LTE

*(LTE\_eMTC4-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171427)*

*Time budget: 1 TU*

*Documents in this agenda item will be handled in a break out session*

### 9.14.1 Organisational

*Including incoming LSs, rapporteur inputs, running CRs*

- R2-1712104 Reply LS on Early Data Transmission (C1-174595; contact: Qualcomm) CT1 LS in Rel-15 LTE\_eMTC4-Core, NB\_IOTenh2-Core To:RAN2, SA2 Cc:RAN3, SA3, CT4  
 => Noted
- R2-1712114 LS on agreements on early data transmission during random access procedure for NB-IoT and BL/CE UEs in Rel-15 (R1-1719103; contact: HiSilicon) RAN1 LS in Rel-15 LTE\_eMTC4, NB\_IOTenh2 To:RAN2  
 => Noted
- R2-1712121 LS on agreements on UL HARQ-ACK feedback in Rel-15 LTE eMTC (R1-1719206; contact: ZTE) RAN1 LS in Rel-15 LTE\_eMTC4 To:RAN2  
 => Noted
- R2-1712154 Reply LS on Early Data Transmission (S2-178180; contact: Qualcomm) SA2 LS in Rel-15 LTE\_eMTC4-Core, NB\_IOTenh2-Core To:RAN2, CT1 Cc:RAN3, SA3  
 => Noted
- R2-1712636 Running CR for Early Data Transmission Intel Corporation CR Rel-15 36.321 14.4.0 1193 - B LTE\_eMTC4-Core  
 => Companies are welcome to provide comments. The document is considered to be provided for information.
- R2-1713710 Introduction of Early Data Transmission (eMTC) Qualcomm Incorporated draftCR Rel-15 36.331 14.4.0 B LTE\_eMTC4-Core

=> Companies are welcome to provide comments. The document is considered to be provided for information.

R2-1714156 Reply LS on early data transmission (R1-1719305; contact: Huawei) RAN1 LS in Rel-15 LTE\_eMTC4, NB\_IOTenh2 To:RAN2  
=> Noted.

## 9.14.2 Early data transmission

*Early Data transmission for NB-IoT and MTC is treated jointly under this AI.  
Including output of email discussion [99bis#53][MTC/NB-IoT] EDT indication via PRACH – Ericsson  
Including output of email discussion [99bis#55][MTC/NB-IoT] EDT RRC messages – Huawei*

R2-1713057 [99bis#53][MTC/NB-IoT] EDT indication via PRACH Ericsson report LTE\_eMTC4-Core, NB\_IOTenh2-Core

**Proposal 1 EDT is indicated when the Msg3 size the UE intends to transmit is equal or smaller than the maximum possible grant size for Msg3 broadcast per CE.**

- QC is concerned about the wording. Instead of “indicated”, “initiated” can be used. Nokia agrees. MediaTek thinks “indicated” also seems to be fine.

**Proposal 2 Discuss if segmentation is allowed in Msg3 for the UP solution.**

- MediaTek thinks that segmentation is already supported, so it would be natural that it is supported in this case. LG agrees. Huawei thinks this does not seem to be beneficial assuming that the eNB always allocates the maximum possible TBS broadcast per CE for transmitting. It will also add complexity.

- Ericsson explains that the benefit would be not to waste the grant if it is smaller than user data.

- Nokia would like to keep the solution simple and therefore there is no need to support segmentation in this case. Veolia agrees.

- LG thinks it is possible that the eNB provides a grant with a TBS size smaller than the maximum broadcast. Segmentation would be beneficial.

- MediaTek thinks that the eNB either provides a grant with the legacy size or the maximum possible size. QC also agrees.

- Show of hands:

Segmentation is supported for this case: 5

Segmentation is not supported for this case: 8

- QC thinks that this may impact UEs using the CP solution. SW think we can come back to it in the future.

=> Support for segmentation for this case is not prioritized for now. We will come back to it in the future.

**Proposal 3 EDT indication is configured per enhanced coverage level.**

**Proposal 4 Data size intended for early UL transmission is not explicitly indicated with preamble partitioning.**

- Kyocera agrees even though it may be beneficial. MediaTek thinks this would have a big impact on the number of repetitions required to transmit and UE power consumption. Nokia shares MediaTek’s concerns.

- SW thinks that UE can be provided a flexible sized grant from which the UE can use.

- LG thinks segmentation helps in this case. Intel does not understand the concern.

- MediaTek thinks PRACH partitioning can be considered to address this issue. Nokia and ZTE agree.

- LG thinks one also needs to think about the resolution of such partitioning. It may require many fragments. Ericsson agrees. SW thinks these two approaches can be merged.

=> Working assumption: PRACH resource partitioning is not supported to indicate the intended data size other than legacy or maximum TBS broadcast per CE.

**Proposal 5 UE category is not indicated using preambles, assuming that maximum TBS supported for EDT in the UL is 1000 bits or less.**

**Proposal 6 Discuss if random access resource partitioning is configured with respect to physical layer resources, preambles or both, i.e. as in legacy eMTC or NB-IoT, for EDT indication.**

- Ericsson explains that this is not necessarily about shared vs. legacy way of partitioning.
- QC thinks that this may differently for eMTC and NB-IoT. LG agrees. Ericsson wonders what “dedicated resources” mean which was brought up during the email discussion.
- QC thinks PRACH resource pool should be separate from the legacy resource pool. Nokia agrees.
- Huawei wants to have a configuration similar to the legacy.

**Proposal 7 Discuss how uplink resources for transmitting Msg3 can be allocated efficiently, e.g. to minimize the number of padding bits etc.**

- This proposal has already been discussed within the context of the discussions above.

**Proposal 8.a Legacy UL grant format is used for early data transmission in Msg3.**

**Proposal 8.b Discuss alternative grant allocation mechanisms, e.g. how to allocate multiple grants or TB sizes for blind reception at eNB.**

**Agreements**

- The UE initiates EDT in Msg1 when the size of Msg3 including the user data, which UE intends to transmit, is equal or smaller than the maximum possible TBS size for Msg3 broadcast per CE.
- PRACH partitioning for EDT indication is configured per enhanced coverage level.
- Working assumption: Support for segmentation for this case is not prioritized.
- Working assumption: PRACH resource partitioning is not supported to indicate the intended data size other than legacy or maximum TBS broadcast per CE.
- FFS how to address the padding issue in Msg3.
- UE category is not indicated in Msg1.
- For EDT indication, PRACH resources can be configured as in legacy eMTC or NB-IoT with respect to physical layer resources, preambles/subcarriers.
- PRACH resource pool, i.e. physical layer resources, preambles/subcarriers, for EDT indication is separate from PRACH resource pool for legacy RACH procedure.

**[100#38][MTC R15] Email discussion on how to address the padding issue in Msg3 [Ericsson]**

Intended outcome: Report to next meeting  
Deadline: Thursday 2017-02-08

R2-1713679	On NB-IoT EDT indication via PRACH	MediaTek Beijing Inc.	discussion	Rel-15
R2-1713189	Trigger for EDT	Huawei, HiSilicon, Neul	discussion	Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core
R2-1713191	RACH procedure in early data transmission	Huawei, HiSilicon, Neul	discussion	Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core
R2-1713054	Remaining general aspects of early data transmission	Ericsson	discussion	LTE_eMTC4-Core, NB_IOTenh2-Core
R2-1713182	Report of email discussion [99bis#55]NB-IoT MTC] on EDT RRC Messages			Huawei report Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core

**For the CP solution:**

**Proposal A.1: Prerequisites to initiate early data transmission include 1) the eNB signals RACH preambles for EDT indication, 2) the resulting MAC PDU can fit in the TBS broadcast in system information, 3) NAS has requested the establishment for user data, i.e. excluding NAS signalling and SMS.**

- QC thinks these are already captured in previous agreements

**Proposal A.2: UE-Id (S-TMSI), the establishment cause and the NAS PDU are included in MSG3 for EDT.**

- This was discussed and agreed previously.

**Proposal A.3: An indication whether further UL/DL data are expected is included in MSG3 for EDT,**

- Huawei explains that an indication similar to NAS RAI is needed. LG thinks this may not be needed since it can be indicated in BSR. Huawei clarifies that this does not necessarily mean that no further data is expected in the UL and DL as a response to the data in the UL.

- Nokia thinks EDT indication should be coupled with such indication. QC agrees.

- Huawei wants to couple EDT with NAS RAI, i.e. A UE that indicates EDT shall also indicate NAS RAI in NAS PDU. Veolia agrees.

- MediaTek wonders if this coupling is strictly needed. Ericsson thinks there is no need to couple. LG agrees.

**Proposal A.4: None of the parameters currently in MSG5 is included in MSG3 for EDT.**

**Proposal A.5: UE is in RRC\_IDLE when sending MSG3 for EDT, same as legacy.**

**Proposal A.6: UE shall satisfy the prerequisites for EDT (proposal A1) and performs access barring check before initiating EDT.**

**Proposal A.7: RAN2 to discuss the RRC/MAC modelling for MSG3 transmission (TBS check, UL grant check, MSG3 padding...)**

=> This discussion is postponed for now.

**Proposal A.8: RAN2 to discuss whether changes to T300 and *mac-contentionResolutionTimer* are needed.**

- Huawei thinks it is less likely that the response data will be available in such a short time, so in most, if not all, cases, there will not be any data to transmit in the DL. Therefore, there is no need to extend the timer.

- Intel thinks there seems to be issues, so it would be good to address.

- LG would like to get opinion from RAN3.

- Sony wants to extend the timer assuming that there may be a response from the application server.

-

**Proposal A.9: RAN2 to discuss whether to use a critical extension of *RRCConnectionRequest* message or a new RRC message. This can be discussed together with Proposal A.18.**

- LG wants to use the existing message. Intel wonders what is meant by new. Ericsson supports LG and thinks that this is not self-contained. ZTE wants to introduce a new message. Huawei agrees. QC also supports to introduce a new RRC message.

- Kyocera supports the existing message. Veolia supports introducing a new message.

**Proposal A.18: When the final state indicated by MSG4 is RRC\_IDLE, MSG4 is a new RRC message.**

- LG wants to use the existing RRC message.

- QC thinks if the network wants to release the UE, it should use a new release message.

- MediaTek thinks it is possible to use the existing messages both for Msg3 and Msg4. QC thinks that the names of the existing messages would not be semantically correct.

**Proposal A.10: DL EDT is supported by UEs supporting UL EDT and only by those.**

**Proposal A.11: For DL EDT following UL EDT, support is implicit.**

- This proposal is captured already.

**Proposal A.12: For DL EDT for the MT call, UE uses UL EDT to send the paging response in MSG3 and thus support is also implicit.**

- LG thinks that the network may know whether the UE support EDT.

**Proposal A.13: For the MT case, RAN2 to discuss how the eNB gets the information that no further data are expected, UE or MME.**

=> We will focus on the MO case in this meeting and consider not specifying a solution for the MT case in Rel-15. Companies are welcome to provide contributions to the next meeting on whether MT case should be supported in Rel-15.

**Proposal A.14: a NAS PDU, *extendedWaitTime*, *redirectedCarrierInfo* and for eMTC *idlemodeMobilityInfo* can be optionally included in MSG4.**

- MediaTek suggest keeping the *extendedWaitTime* in Msg4. ZTE, Nokia, and Ericsson agree. LG wants to keep the existing parameters in the legacy release message. Huawei explains that the only parameter excluded here is *extendedWaitTime-CPdata*. LG wants to confirm if both are needed. Huawei explains that only one of them is needed in this case, i.e. when Msg4 is for releasing the UE, since the UE will be released. The intention with the legacy mechanism is to provide means to the MME to inform the eNB to release the UE with an extended wait timer.

=> We will reconsider the agreement if LG confirms that both, i.e. *extendedWaitTime* and *extendedWaitTime-CPdata*, are needed.

**Proposal A.15: RAN2 to discuss whether *releaseCause* is included, or cause 'other' is implicit.**

- Huawei thinks "other" is fine. QC wonders if *releaseCause* can be implicitly provided in the UE. MediaTek explains that it is needed internally in the UE for NAS-AS interaction.  
- LG thinks this should be provided. MediaTek suggest having FFS for "load balancing".

**Proposal A.16: UE is in RRC\_IDLE when receiving MSG4 and does not transit to RRC\_CONNECTED if the final state indicated by MSG4 is RRC\_IDLE.**

- MediaTek there is no need to mention connected mode as the UE is supposed to do anything particular. This may be different for the UP solution. Huawei agrees.  
- LG prefers to keep the state transition mechanism same for both CP and UP solutions.  
- MediaTek explains that in the NAS level the UE will be in connected mode and back shortly. But this is not needed for the AS level.

**Proposal A.17: When the final state indicated by MSG4 is RRC\_IDLE, UE forwards the NAS PDU to upper layers, acts on other IEs included as per legacy, and indicates the completion of the procedure to the upper layers.**

**Proposal A.18: When the final state indicated by MSG4 is RRC\_IDLE, MSG4 is a new RRC message.**

- This proposal has already been agreed.

**Proposal A.19: No change needed to *RRCConnectionSetup* when the final state is RRC\_CONNECTED.**

- Ericsson wonders if it would be beneficial to have the possibility to deliver DL NAS PDU. Huawei does not think this would be beneficial considering that the UE will be in connected state.  
- QC thinks the UE is not in connected mode yet, so no need to deliver the data. MediaTek thinks this does not seem to be beneficial.  
- LG agrees with Ericsson. Veolia agrees with MediaTek and Huawei.  
- QC wonders how it would be possible to know whether UL transmission is successful.  
- MediaTek thinks the failure case would be followed by *RRCConnectionReject* message.  
- LG does not want to use the reject message for the failure.

- ZTE thinks the UE should know whether the data is delivered regardless of UE going to idle or continuing to establish the connection.

**Proposal A.20: No optimisation to *RRCConnectionSetupComplete* is needed when the final state is *RRC\_CONNECTED*.**

**Proposal A.21: RAN2 to discuss the mandatory NAS container.**

- Huawei suggests that the NAS container can be sent empty, i.e. length of the container is set to 0. Ericsson agrees. This needs to be checked from ASN.1 standpoint.

-

**Proposals for the UP solution:**

**Proposal B.1: Same as Proposal A.1. In addition, the UE should have a NCC, pending on SA3 feedback.**

**Proposal B.2: RAN2 to discuss whether segmentation of the data is supported in MSG3.**  
- This proposal has already been discussed.

**Proposal B.3: UE-Id (*resumeID*), *shortResumeMAC-I* and *resumeCause* are included in RRC MSG3 for EDT.**

- Ericsson suggests including a longer version of *shortResumeMAC-I* in Msg3. Huawei thinks there may be a need to couple NCC with this longer version to keep compatibility.

=> We will discuss introducing a longer version of *shortResumeMAC-I* if SA3 indicates that there may be issues with respect to security.

=> We can reconsider the related agreement on whether it should also be possible to use the trunked version of the *resumeID* if needed.

**Proposal B.4: RAN2 to discuss whether an indication that further UL/DL data are expected is included in MSG3 for EDT.**

- ZTE thinks it would be good to have the indication. Huawei suggests having this discussion later. LG agrees with ZTE. LG thinks it may be possible to send the actual data size. Ericsson supports to have the indication. QC thinks this discussion is related to segmentation. Intel wants the indication. Blackberry and Sony also support the indication.

- SW thinks the mechanism should be simple and the UE wants to send something more it may trigger another EDT.

- Sony would like to support to indicate the size of the data that the UE was not able to transmit due to grant size, but has concerns regarding UEs abusing the use of EDT.

- Gemalto is not in favour the indication since it is hard for the UE to know whether there is more data coming to be transmitted in the UL.

=> RAN2 understands that it is already possible for the UE to send the indication in AS if configured earlier, i.e., before suspended.

**Proposal B.5: None of the parameters currently in MSG5 is included in MSG3 for EDT.**

**Proposal B.6: UE is in *RRC\_IDLE* when sending MSG3 for EDT, same as legacy.**

**Proposal B.7: Same as Proposal A.6 for the CP solution.**

**Proposal B.8: UE shall restore the UE context, reactivate security, deriving new keys based on the NCC provided at the suspension, and re-establish/ resume all SRBs/DRBs.**

- QC and Huawei think that this can be a working assumption until feedback is received from SA3.

- LG thinks that it would be good to indicate to the UE which DRB is for EDT, so that only that DRB can be activated.

- Ericsson thinks there is no need to allocate a DRB for EDT. ZTE wonders if this would be this DRB cannot be used for any other traffic. MediaTek wonders if there is a limitation in Suspend/Resume regarding using particular SRBs/DRBs.

- LG wonders how the UE knows whether EDT is triggered for a particular type of traffic. MediaTek wonders if these aspects will be captured in Stage 2.

**Proposal B.9: RAN2 to discuss whether to use a 'critical' extension of *RRCConnectionResumeRequest* message or a new RRC message. This can be discussed together with proposal B.16.**

- QC prefers new messages. Intel thinks the legacy message can be used considering that the data is muxed.
- Huawei thinks using the same message would be fine, but a new procedure may be needed.
- LG prefers to use the legacy message. ZTE prefers a new message.
- MediaTek thinks it is logically closer to resume, so maybe it is better to use the existing message.

**Proposal B.10: Proposals A.9, A.10, A.11, A.12 apply to the UP solution.**

- These proposals have already been captured.

**Proposal B.11: Same contents as *RRCConnectionRelease* plus NCC is included in MSG4 for EDT.**

**Proposal B.12: RAN2 to discuss whether a NAS PDU can also be included in MSG4 for EDT.**

**Proposal B.13: RAN2 to discuss UE state when receiving MSG4 and after receiving MSG4 for EDT when the final state is *RRC\_IDLE*.**

**Proposal B.14: When the final state indicated by MSG4 is *RRC\_IDLE*, UE forwards the data to upper layers, and performs the same actions as for legacy *RRCConnectionRelease*.**

**Proposal B.15: RAN2 to wait for SA3 feedback for MSG4 security aspect when the final state is *RRC\_IDLE*.**

**Proposal B.16: RAN2 to discuss which RRC message for MSG4 when the final state is *RRC\_IDLE*.**

- Ericsson wants to use the RRC connection release message.

**Proposal B.17: No change is expected to *RRCConnectionResume* when the final state is *RRC\_CONNECTED*.**

**Proposal B.18: RAN2 to wait for SA3 feedback for MSG4 security aspect in the case the final state is *RRC\_CONNECTED*.**

**Proposal B.20: No optimisation to *RRCResumeSetupComplete* is needed when the final state is *RRC\_CONNECTED*.**

**Agreements**

For CP solution

- None of the parameters currently provided in Msg5 are included in Msg3 for EDT.
- UE is in *RRC\_IDLE* when transmitting Msg3 for EDT, same as legacy.
- UE shall perform access barring check before initiating EDT.
- FFS whether changes to T300 and *mac-contentionResolutionTimer* are needed.
- New RRC message is introduced for Msg3.
- New RRC message is introduced for Msg4 in case network sends the UE to idle mode.
- UE supporting EDT shall support both UL and DL EDT.
- Msg4, which is agreed to be introduced as the new RRC message, optionally includes a NAS PDU, *extendedWaitTime*, *redirectedCarrierInfo* and for eMTC *idleModeMobilityControlInfo*. No need to include *extendedWaitTime-CPdata* in this case.
- FFS whether releaseCause is included in the new Msg4.
- UE is in *RRC\_IDLE* when receiving the new Msg4 and it does not transit to *RRC\_CONNECTED*.
- When the UE receives the new Msg4, the UE forwards the DL NAS PDU, if any, to upper layers, follows the legacy behavior based on included IEs, and indicates the completion of

- the procedure to the upper layers.
- Legacy *RRConnectionSetup* message is used when the network wants the UE to move to RRC\_CONNECTED. The UE assumes that UL data transmission was succesful, i.e. up to MME.
  - In EDT, it is possible for the UE to receive *RRConnectionReject* message in response to the new Msg3.
  - Legacy *RRConnectionSetupComplete* is used when the network wants the UE to move to RRC\_CONNECTED. NAS container in *RRConnectionSetupComplete* message may be sent empty. FFS if this is possible from ASN.1 standpoint.

For UP solution

- UE supporting EDT shall support both UL and DL EDT.
- The UE shall have NCC prior ro indicating EDT.
- *resumeID*, *shortResumeMAC-I*, and *resumeCause* are included in Msg3 for EDT.
- None of the parameters currently provided in MSG5 are included in Msg3 for EDT.
- UE is in RRC\_IDLE when transmitting Msg3 for EDT, same as legacy.
- UE shall perform access barring check before initiating EDT.
- UE shall restore the UE context, reactivate security, and re-establish/resume all SRBs/DRBs.  
The UE shall derive new keys based on the NCC provided in the previous connection. It is FFS in which message NCC is provided in the previous connection. The FFS is pending SA3 feedback.
- Legacy *RRConnectionResumeRequest* message is used in Msg3.
- Legacy *RRConnectionRelease* message with suspend is extended to include NCC in Msg4 when the network wants the UE to move to RRC\_IDLE.

- Veolia would like to have an email discussion to discuss the support for segmentation for the UP solution.

Email discussion to progress the running 36.331 CR for eMTC to capture the Rel-15 agreements [Qualcomm]

- Intention: to progress the running 36.331 CR for eMTC to capture the Rel-15 agreements.
- The email discussion is until the next meeting.

Email discussion to progress the running 36.321 CR for eMTC to capture the Rel-15 agreements [Intel]

- Intention: to progress the running 36.321 CR for eMTC to capture the Rel-15 agreements.
- The email discussion is until the next meeting.

- |            |  |                         |            |
|------------|--|-------------------------|------------|
| R2-1713056 | Remaining Issues in Early Data Transmission over NAS               | Ericsson                | discussion |
|            | LTE_eMTC4-Core, NB_IOTenh2-Core                                    |                         |            |
| R2-1713184 | Remaining issues for EDT in the CP solution for eMTC and NB-IoT    | Huawei, HiSilicon, Neul | discussion |
|            | Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core                             |                         |            |
| R2-1713185 | Remaining issues for EDT in the UP solution for eMTC and NB-IoT    | Huawei, HiSilicon, Neul | discussion |
|            | Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core                             |                         |            |
| R2-1713055 | Remaining issues on early data transmission over UP                | Ericsson                | discussion |
|            | LTE_eMTC4-Core, NB_IOTenh2-Core                                    |                         |            |
| R2-1712639 | Early data transmission discussion for eFeMTC and FeNB-IoT         | Intel Corporation       | discussion |
|            | Rel-15 LTE_eMTC4-Core  |                         |            |
| R2-1713190 | Early DL data transmission   | Huawei, HiSilicon, Neul | discussion |
|            | Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core                             |                         |            |
| R2-1713506 | Transmission Reliability with Early Data Transmission              | MediaTek Beijing Inc.   | discussion |
|            | Rel-15   |                         |            |
| R2-1713188 | PRACH partitioning for early data transmission                     | Huawei, HiSilicon, Neul | discussion |
|            | Rel-15 NB_IOTenh2-Core, LTE_eMTC4-Core                             |                         |            |
| R2-1713503 | Remaining issues for basic functionality of EDT in eFeMTC/FeNB-IoT | Kyocera                 | discussion |
|            | discussion   |                         |            |
| R2-1713713 | Discussion on some FFses on EDT                                    | Qualcomm Incorporated   | discussion |
|            | Rel-15 LTE_eMTC4-Core  |                         |            |
| R2-1713644 | (N)PRACH resource partitioning for EDT indication                  | LG Electronics Polska   | discussion |
|            | LTE_eMTC4-Core   |                         |            |



R2-1713649	Clarification on MAX grant size for Msg3 and UP solution LTE_eMTC4-Core	LG Electronics Polska	discussion
R2-1713785	Early Data Transmission Failure Handling in NB-IoT Rel-15 R2-1711402	LG Electronics Inc.	discussion
R2-1712982	Remaining issues for EDT ZTE Corporation, Sanechips Core, NB_IoTenh2-Core	discussion	Rel-15 LTE_eMTC4-
R2-1712940	Network initiated early UL data transmission Rel-15 LTE_eMTC4-Core	Nokia, Nokia Shanghai Bell	discussion
R2-1712315	Fall-back mode from early data transmission	III	discussion Rel-15 NB_IoTenh2
R2-1713754	Issues on early data transmission (related to email discussion) discussion Rel-15 R2-1711158	LG Electronics Inc.	
R2-1713758	Indication of support for EDT	LG Electronics Inc.	discussion Rel-15
R2-1713787	Early Data Transmission Failure Handling in MTC 15 LTE_eMTC4-Core R2-1711403	LG Electronics Inc.	discussion Rel-
R2-1713862	PRACH for EDT requests	Sierra Wireless, S.A.	discussion Rel-15
R2-1713058	Evaluation for early data transmissions NB_IoTenh2-Core	Ericsson	discussion LTE_eMTC4-Core,
R2-1713183	Introduction of Early data transmission in 36.331 36.331 14.4.0 B NB_IoTenh2-Core	Huawei, HiSilicon	draftCR Rel-15

### 9.14.3 System acquisition time enhancements

*System acquisition Enhancements for NB-IoT and MTC is treated jointly under this AI.*

R2-1713050	Reduced System Acquisition Time NB_IoTenh2-Core	Ericsson	discussion	LTE_eMTC4-Core,
R2-1713106	Accumulation across SIB1-BR/SI modification period Rel-15 LTE_eMTC4-Core R2-1711215	Huawei, HiSilicon	discussion	

#### **Agreements**

- RAN2 confirms that SIB1-BR accumulation across SIB1-BR modification period is possible since it has been introduced in Rel-13, and it is left to UE implementation.
- RAN2 confirms that SI message accumulation across SI windows and modification period is possible since it has been introduced in Rel-13, and it is left to UE implementation.

R2-1713053	DRAFT LS reply on system acquisition time reduction for Rel-15 LTE-MTC out LTE_eMTC4-Core To:WG1	Ericsson	LS
R2-1713107	[DRAFT] Reply LS on System acquisition time reduction for Rel-15 LTE MTC HiSilicon LS out Rel-15 LTE_eMTC4-Core R2-1711216 To:RAN1, RAN4	Huawei,	

Draft LS reply to RAN1 on system acquisition time reduction for Rel-15 LTE-MTC [offline# 401] [Huawei] in R2-1714014

- Address the questions asked in the LS from RAN1
- Include the agreements from the last meeting.
- Capture the agreements from this meeting.

R2-1714014	[DRAFT] Reply LS on System acquisition time reduction for Rel-15 LTE MTC Rel-15 LTE_eMTC4-Core R2-1713107 To:RAN1, RAN4	Huawei	
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=> The LS is approved in R2-1714015.

R2-1712337	Remaining issues for system acquisition time reduction in eFeMTC discussion Rel-15 LTE_eMTC4-Core	ZTE Corporation, Sanechips	
R2-1713108	Skip system information reading for MTC based on neighbour cell indication HiSilicon discussion Rel-15 LTE_eMTC4-Core	Huawei,	
R2-1713110	Introduction of system information acquisition optimisation in MIB and SIB4 draftCR Rel-15 36.331 14.4.0 B LTE_eMTC4-Core	Huawei, HiSilicon	
R2-1713051	Skipping SIB1-BR acquisition	Ericsson	discussion LTE_eMTC4-Core

R2-1713052	Skipping SIB1-BR acquisition B LTE_eMTC4-Core	Ericsson	CR	Rel-15	36.331	14.4.0	3162	-
R2-1713678	System Information Storage and Validity across NB-IoT Cells discussion NB_IOTenh2-Core							MediaTek Beijing Inc.
R2-1713764	MIB-NB skipping in NB-IoT	LG Electronics Inc.	discussion	Rel-15				
R2-1713816	New parameters on NPDCCH for skipping MIB-NBLG 14.4.0 3199 - C LTE_eMTC4-Core	Electronics	CR	Rel-15	36.331			
R2-1713763	Optimization of SI acquisition in MTC 1711649	LG Electronics Inc.	discussion	Rel-15				R2-
R2-1713109	Skip system information reading for MTC based on MIB indication discussion Rel-15 LTE_eMTC4-Core							Huawei, HiSilicon
R2-1713111	Introduction of system information acquisition optimisation in MIB draftCR Rel-15 36.331 14.4.0 B LTE_eMTC4-Core							Huawei, HiSilicon
R2-1713105	System Information acquisition enhancements. 15 LTE_eMTC4-Core	Huawei, HiSilicon	discussion	Rel-15				
R2-1713840	EAB indications in MIB	Sierra Wireless, S.A.	discussion	Rel-15				
R2-1713192	Introduction of additional SIB1-NB transmissions in 15 36.331 14.4.0 B NB_IOTenh2-Core							Huawei, HiSilicon draftCR Rel-

#### 9.14.4 Relaxed monitoring for cell reselection

*Relaxed monitoring for cell reselection for MTC is treated jointly with NB-IoT under AI 9.13.4. Do not use this AI for any item that can be discussed jointly.*

#### 9.14.5 Access/load control of idle mode UEs

R2-1712335	Further consideration on access control in eFeMTC discussion Rel-15 LTE_eMTC4-Core							ZTE Corporation, Sanechips
R2-1713502	CE-based access barring and load balancing for idle mode UEs for eFeMTC discussion							Kyocera
R2-1712640	CE level based access barring and load control for eFeMTC discussion Rel-15 LTE_eMTC4-Core							Intel Corporation
R2-1713112	Existing solutions for access/load control of idle mode UEs Rel-15 LTE_eMTC4-Core	Huawei, HiSilicon	discussion	Rel-15				
R2-1713113	Improved access/load control of idle mode UEs 15 LTE_eMTC4-Core	Huawei, HiSilicon	discussion	Rel-15				
R2-1713068	Improved Idle Mode Access Control for eFeMTC UEs LTE_eMTC4-Core	Ericsson	discussion	Rel-15				
R2-1713069	Improved Idle Mode Access Control for eFeMTC UEs 36.331 14.4.0 3166 - B LTE_eMTC4-Core	Ericsson	CR	Rel-15				
R2-1713755	Access barring for CE level in eFeMTC 1711160	LG Electronics Inc.	discussion	Rel-15				R2-
R2-1712812	Improved Access and Load Control for Idle Mode UEs LTE_eMTC4-Core Withdrawn	Fujitsu	discussion	Rel-15				
R2-1712821	Improved Access and Load control for Idle Mode UEs LTE_eMTC4-Core R2-1710354 Withdrawn	Fujitsu	discussion	Rel-15				
R2-1712976	Improved Access and Load control for Idle Mode UEs LTE_eMTC4-Core R2-1710354	Fujitsu	discussion	Rel-15				

#### 9.14.6 Uplink HARQ-ACK feedback

R2-1713114	Uplink HARQ-ACK feedback for early termination of MPDCCH monitoring discussion Rel-15 LTE_eMTC4-Core							Huawei, HiSilicon
R2-1713115	Uplink HARQ-ACK feedback for early termination of PUSCH transmission discussion Rel-15 LTE_eMTC4-Core							Huawei, HiSilicon
R2-1712231	DRX enhancement using HARQ feedback 36.321 LTE_eMTC4-Core R2-1711300	LG Electronics Inc.	discussion	Rel-15				

R2-1712232	DRX enhancement using HARQ feedback	LG Electronics Inc.	draftCR	Rel-15	36.321				
	14.4.0 C LTE_eMTC4-Core	R2-1711310							
R2-1712233	RA enhancement using HARQ feedback	LG Electronics Inc.	discussion	Rel-15					
	36.321 LTE_eMTC4-Core	R2-1711359							
R2-1712336	Further consideration on Uplink HARQ-ACK feedback in eFeMTC	ZTE Corporation, Sanechips	discussion	Rel-15					
	Rel-15 LTE_eMTC4-Core								
R2-1713059	Uplink HARQ ACK feedback for MTC	Ericsson	discussion						LTE_eMTC4-Core
R2-1713060	Uplink HARQ ACK feedback for BL UEs and UEs in CE	Ericsson	CR	Rel-15					
	36.306 14.4.0 1530 - B	LTE_eMTC4-Core							
R2-1713061	Uplink HARQ ACK feedback for BL UEs and UEs in CE	Ericsson	CR	Rel-15					
	36.321 14.4.0 1198 - B	LTE_eMTC4-Core							
R2-1713062	Uplink HARQ ACK feedback for BL UEs and UEs in CE	Ericsson	CR	Rel-15					
	36.331 14.4.0 3163 - B	LTE_eMTC4-Core							

### 9.14.7 Increased PDSCH spectral efficiency

R2-1713116	Increased PDSCH spectral efficiency for Rel-15 MTC	Huawei, HiSilicon	discussion						
	Rel-15 LTE_eMTC4-Core	R2-1711220							
R2-1713117	DRAFT LS on signalling support of 64QAM for Rel-15 MTC	Huawei, HiSilicon	LS						
	out Rel-15 LTE_eMTC4-Core	R2-1711221 To:RAN1							
R2-1713118	Introduction of 64QAM for PDSCH in Rel-15 MTC	Huawei, HiSilicon	draftCR	Rel-15					
	36.331 14.4.0 B	LTE_eMTC4-Core							
R2-1713119	Introduction of 64QAM for PDSCH in Rel-15 MTC	Huawei, HiSilicon	draftCR	Rel-15					
	36.306 14.4.0 B	LTE_eMTC4-Core							
R2-1713066	Introduction of DL 64QAM for BL/CE UEs	Ericsson	CR	Rel-15	36.306	14.4.0	1532		
	- B	LTE_eMTC4-Core							
R2-1713067	Introduction of DL 64QAM for BL/CE UEs	Ericsson	CR	Rel-15	36.331	14.4.0	3165		
	- B	LTE_eMTC4-Core							

### 9.14.8 Increased PUSCH spectral efficiency

R2-1713120	Increased PUSCH spectral efficiency for Rel-15 MTC	Huawei, HiSilicon	discussion						
	Rel-15 LTE_eMTC4-Core								
R2-1713877	Message 3 support for Sub-PRB Uplink	Sierra Wireless, S.A.	discussion	Rel-15					
R2-1713064	Introduction of UE capability for PUSCH sub-PRB allocation	Ericsson	CR	Rel-					
	15 36.306 14.4.0 1531 - B	LTE_eMTC4-Core							
R2-1713065	Introduction of UE capability for PUSCH sub-PRB allocation	Ericsson	CR	Rel-					
	15 36.331 14.4.0 3164 - B	LTE_eMTC4-Core							

### 9.14.9 Wake Up Signal

*Wake Up Signal etc for MTC is treated jointly with NB-IoT under AI 9.13.9 Do not use this AI for any item that can be discussed jointly.*

R2-1713786	Issues on Wake-Up Signal for MTC	LG Electronics Inc.	discussion	Rel-15					
	LTE_eMTC4-Core	Withdrawn							

### 9.14.10 Other

*Including higher UE velocity, lower UE power class, CRS muting etc.*

R2-1712333	Consideration on supporting lower UE power class in eFeMTC	ZTE Corporation, Sanechips	discussion	Rel-15					
	Rel-15 LTE_eMTC4-Core								
R2-1713046	Lower power class UE for LTE-MTC	Ericsson	discussion						LTE_eMTC4-Core
	R2-1710515								
R2-1713047	Introducing 14 dBm UE power class for BL UEs	Ericsson	CR	Rel-15	36.304				
	14.4.0 0395 - B	LTE_eMTC4-Core							

R2-1713048	Introducing 14 dBm UE power class for BL UEs	Ericsson	CR	Rel-15	36.306
	14.4.0 1529 - B LTE_eMTC4-Core				
R2-1713049	Introducing 14 dBm UE power class for BL UEs	Ericsson	CR	Rel-15	36.331
	14.4.0 3161 - B LTE_eMTC4-Core				
R2-1713121	Lower UE power class for Rel-15 MTC	Huawei, HiSilicon	discussion	Rel-15	
	LTE_eMTC4-Core R2-1711222				
R2-1713122	Draft Reply LS on new UE power class for Rel-15 MTC	Huawei, HiSilicon		LS out	Rel-
	15 LTE_eMTC4-Core R2-1711223 To:RAN4 Cc:RAN1				
R2-1713123	Introduction of Lower UE power class for Rel-15 MTC	Huawei, HiSilicon		draftCR	Rel-
	15 36.331 14.4.0 B LTE_eMTC4-Core				
R2-1713124	Introduction of Lower UE power class for Rel-15 MTC	Huawei, HiSilicon		draftCR	Rel-
	15 36.304 14.4.0 B LTE_eMTC4-Core				
R2-1713125	Introduction of Lower UE power class for Rel-15 MTC	Huawei, HiSilicon		draftCR	Rel-
	15 36.306 14.4.0 B LTE_eMTC4-Core				
R2-1713126	Discussion on higher UE velocity in Rel-15 MTC	Huawei, HiSilicon	discussion	Rel-	
	15 LTE_eMTC4-Core				
R2-1713063	CRS muting	Ericsson	discussion	LTE_eMTC4-Core	R2-1710527
R2-1713127	On CRS muting for BL UEs	Huawei, HiSilicon	discussion	Rel-15	LTE_eMTC4-Core

## 9.15 Highly Reliable Low Latency Communication for LTE

*LTE\_HRLLC-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171489*

*Time budget: 0.5 TU*

*Documents in this agenda item will be handled in a break out session*

R2-1712124 LS on Ultra Reliable Low Latency Communication for LTE (R1-1719210; contact: Ericsson) RAN1  
 LS in Rel-15 LTE\_HRLLC To:RAN2  
 => Noted

### *PDCP duplication:*

R2-1713791 Discussion on the L2 Impact from Packet Duplication Huawei, HiSilicon discussion  
 Rel-15 LTE\_HRLLC-Core

P1

- OPPO wonder the impact on the spec regarding P1.
- LG think it should depend on eNB implementation.

P2

- Ericsson support the proposal.
- LG think it is not in the scope of WI.
- Ericsson and Huawei think it benefits handover case.

P3

- Ericsson think the reliability is the concern

### **Agreements:**

- 1 The activation/deactivation MAC CE contains a bitmap corresponding to DRBs configured with duplication. The mapping between DRB and the MAC bitmap is based on order of DRB ID(s) of the duplicate configured DRB(s).
- 2 the logical channel handling can take the NR's conclusion as baseline:

- Duplicated PDCP PDUs are submitted to two different RLC entities for two different LCH, and the LCH cannot be mapped on the same carrier.
- LCP takes into account all the restrictions configured for the logical channels (which include the PDCP data duplication restrictions).

R2-1712457 Packet duplication in LTE Ericsson discussion Rel-15 LTE\_HRLLC-Core

P1

- LG think RLC AM is used for throughput enhancement.
- OPPO only support SRB case for RLC AM.
- Huawei think DRB and SRB should both be supported.

=> SRB duplication is in the scope of the WI.

P2

- OPPO think it should be deprioritised. LG share the same view.
- OPPO wonder the benefit of supporting RLC AM via CA case.

**Agreements:**

- 1 Support RLC AM for SRB for packet duplication via DC and CA. FFS the DRB case.
- 2 Support RLC UM for packet duplication via DC.
- 3 Apply LTE PDCP to support packet duplication. FFS the necessary changes.
- 4 Support PDCP reordering for duplication case

R2-1713716	Issues on PDCP duplication	LG Electronics France	discussion	Rel-15	LTE_HRLLC-Core
R2-1712188	Discussion on LTE PDCP receive operation	OPPO	discussion	Rel-15	LTE_HRLLC-Core
R2-1712190	Discussion on UL duplication control	OPPO	discussion	Rel-15	
R2-1713337	Discussion on the RRC Impact from Packet Duplication	Huawei, HiSilicon	discussion		
	Rel-15	LTE_HRLLC-Core			
R2-1712191	Discussion on use case of UL duplication	OPPO	discussion	Rel-15	LTE_HRLLC-Core

*TB repetition:*

R2-1712459	Transport block repetition for reliability	Ericsson	discussion	Rel-15	LTE_HRLLC-Core
	- LG wonder the relation with TTI bundling. Ericsson think TTI bundling is one of possible solution.				

**Agreements:**

- 1 Transport block repetition is supported for ultra high-reliability within the latency bound.

R2-1713248	Autonomous TTI bundling for HRLLC	LG Electronics Mobile Research	discussion		
	LTE_HRLLC-Core				
	- OPPO would like to know the exact meaning of "autonomously".				
	- Huawei and Ericsson don't know how this can work.				
	- Nokia think it can be workable but not sure the gain of this solution.				
	=> Noted				

*SPS:*

R2-1712189	Discussion on SPS configuration	OPPO	discussion	Rel-15	LTE_HRLLC-Core
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**Agreements:**

- 1 SPS configuration can be active simultaneously for Pcell, PSCell and SCell.
- 2 Multiple active SPS configurations per serving cell are not supported.

R2-1712460	Reliable HARQ feedback for UL SPS	Ericsson	discussion	Rel-15	LTE_HRLLC-Core
	LTE_HRLLC-Core				
R2-1713338	Potential enhancements for HRLLC based on sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core
	Rel-15	LTE_HRLLC-Core	R2-1711116		
R2-1712458	URLLC Techniques for Latency	Ericsson	discussion	Rel-15	LTE_HRLLC-Core
R2-1713339	MAC Structure and Operation for HRLLC	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core
	LTE_HRLLC-Core				
R2-1712216	Discussion on HARQ configuration	OPPO	discussion	Rel-15	LTE_HRLLC-Core

*New scenarios:*

R2-1713340	Discussion on new scenarios and requirements for URLLC service	Huawei, HiSilicon	discussion	Rel-15	LTE_HRLLC-Core
	- Ericsson think it should be discussed in RAN1.				

CRs:

R2-1713708 Support of PDCP reordering function for DRB mapped on RLC UMLG Electronics France CR  
Rel-15 36.323 14.4.0 0215 - B LTE\_HRLLC-Core

Late:

R2-1713166 Achievable reliability and latency for HRLLC Nokia, Nokia Shanghai Bell discussion  
Rel-15 LTE\_HRLLC-Core

## 9.16 UL data compression in LTE

(LTE\_UDC-Core; leading WG: RAN2; Rel-15; started Sep 17; target: Mar 18; WID RP-172076)

Time budget: 1.0 TU

Including output of email discussion [99bis#29][LTE/UDC] Operator controlled dictionary issue [MTK]

*Documents in this agenda item will be handled in a break out session*

Running CRs:

R2-1714084 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.323 14.4.0 B  
=> Endorsed as the running CR.  
=> Add clarification that UDC header packet just for uplink. The wording can be improved.

R2-1714085 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.331 14.4.0 B  
=> Endorsed as the running CR.

Predefined dictionary:

R2-1713907 Summary of email discussion [99bis#29][LTE/UDC] Operator controlled dictionary issue [MTK]  
MediaTek Inc. report Rel-15 LTE\_UDC-Core

P1

- Huawei prefer to set pre-defined dictionary optional. LG share the same view.
- LG wonder the use case of operator-defined dictionary. CMCC think the operator-defined dictionary can provide better benefit for specific traffic or future traffic. SoftBank support to have operator-defined dictionary.

**Agreements:**

- 1 The pre-defined dictionary in RFC 3485 is configurable.
- 2 Specify in RAN2 spec the memory operation for pre-defined dictionary.
- 3 SIP dictionary for UDC is the first 3468 bytes in RFC 3485.
- 4 For the case pre-defined dictionary size is larger than the configured memory size, only the tail of pre-defined dictionary is put into the compression memory to fit the compression memory size.
- 5 The UE only applies 1 operator-defined dictionary in UDC for Release 15.
- 6 Introduce UE capabilities for operator-defined dictionary and SIP dictionary in UDC.
- 7 Operator-defined dictionary is pre-stored in UE by operators.
- 8 Dictionary selection is controlled by NW.

R2-1713352 Pre-Defined Dictionary for UDC Ericsson discussion Rel-15  
- Nokia think operators can align the dictionary. CMCC think the dictionary is different for different operators.  
=> Noted

R2-1712719 Discussion on SIP dictionary RFC 3485 for UDC Huawei, HiSilicon discussion Rel-15  
LTE\_UDC-Core

R2-1712720 Discussion on configuration of UDC dictionary Huawei, HiSilicon discussion Rel-15  
LTE\_UDC-Core

R2-1713309 Standard and Operator defined dictionary capability support for UDC Ericsson CR  
Rel-15 36.306 14.4.0 1538 - B LTE\_UDC-Core

R2-1712245 Summary of email discussion [99bis#29][LTE/UDC] Operator controlled dictionary issue [MTK]  
MediaTek Inc. report Rel-15 LTE\_UDC-Core Withdrawn

R2-1712881 Further Discussion on Pre-defined Dictionary for UDC CATT discussion Rel-15  
LTE\_UDC-Core

*Checksum operation:*

R2-1712878 Checksum Calculation for UDC CATT discussion Rel-15 LTE\_UDC-Core

**Agreements:**

- 1 Checksum algorithm based on 4-bit binary accumulation can be used in UDC.
- 2 In order to get a 4-bit checksum value, right most 4-bit truncation from the sum.
- 3 Checksum value can be bit-reversed before put into UDC header.
- 4 The input of checksum is the first 4 bytes and the last 4 bytes in the buffer. When buffer content is empty, UE sets the content of the buffer to 0. The reset case is FFS.

R2-1713353 Understanding the buffer content And Checksum calculation for UDC Ericsson  
discussion Rel-15

=> Noted

R2-1712713 Discussion on checksum options for UDC Huawei, HiSilicon discussion Rel-15  
LTE\_UDC-Core

R2-1712714 CR on checksum option for UDC Huawei, HiSilicon CR Rel-15 36.323 14.4.0 0204  
- B LTE\_UDC-Core

*Checksum failure handling:*

R2-1713904 Discussion on UDC checksum error handling and message formats MediaTek Inc., CATT  
discussion Rel-15 LTE\_UDC-Core

- Huawei prefer to use RRC message for informing checksum error.
- Ericsson support to use PDCP control PDU.

**Agreements:**

- 1 UDC checksum error is handled by PDCP layer.
- 2 Use PDCP Control PDU for UDC checksum error notification.
- 3 Receiving the notification, the sender resets its compression memory and re-initialize UDC operations.
- 4 Specify in RAN2 spec the FR bit in UDC header for compression memory reset indication.
- 5 Set the content of the buffer to 0 after memory clean-up.

R2-1712808 Discussion on UDC checksum error handling and message formats MediaTek Inc  
discussion Rel-15 LTE\_UDC-Core Withdrawn

R2-1712715 Discussion on checksum failure handling for UDC Huawei, HiSilicon discussion Rel-  
15 LTE\_UDC-Core

R2-1712716 CR on checksum failure handling for UDC Huawei, HiSilicon CR Rel-15 36.323  
14.4.0 0205 - B LTE\_UDC-Core

R2-1712717 CR on checksum failure handling for UDC Huawei, HiSilicon CR Rel-15 36.331  
14.4.0 3145 - B LTE\_UDC-Core

R2-1713357 Release and Reset Behaviour for UDC Ericsson discussion Rel-15

*UDC procedure:*

R2-1712879 Buffer Handling for UDC CATT discussion Rel-15 LTE\_UDC-Core  
=> Capture buffer handling in 36.323. Details can be discussed further.

R2-1712721 Discussion on setup and release of UDC Huawei, HiSilicon discussion Rel-15  
LTE\_UDC-Core

R2-1712722 Discussion on UDC functionality in PDCP layer Huawei, HiSilicon discussion Rel-  
15 LTE\_UDC-Core

**Agreement:**

- 1 PDCP header doesn't include the UDC header.

R2-1712723 CR on UDC functionality in PDCP layer Huawei, HiSilicon CR Rel-15 36.323  
14.4.0 0206 - B LTE\_UDC-Core

*Handover and re-establishment:*

- R2-1712718 Discussion on handover and re-establishment cases for UDC Huawei, HiSilicon  
 discussion Rel-15 LTE\_UDC-Core  
 - Nokia support P1.  
 - CATT think we should follow the RoHC for handover case. Huawei think the case is different.

Agreements:  
 1 UDC context is reset and release during intra-node handover.  
 2 Memory size reconfiguration is supported at handover case.  
 3 Upon initiation of RRC connection re-establishment (i.e. transmission of uplink RRC message *RRConnectionReestablishmentRequest*), the UE shall release the UDC configuration if configured.

R2-1712880 Consideration on Intra-eNB Handover for UDC CATT discussion Rel-15 LTE\_UDC-Core

CRs:

- R2-1712876 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.300 14.4.0 B  
 LTE\_UDC-Core  
 R2-1712877 Introduction of DEFLATE based UDC Solution CATT draftCR Rel-15 36.306 14.4.0 B  
 LTE\_UDC-Core  
 R2-1713767 Introduction of Operator controlled dictionary for UDC MediaTek Inc draftCR Rel-15  
 36.323 14.4.0 B LTE\_UDC-Core  
 R2-1713768 Introduction of Operator-defined dictionary for UDC MediaTek Inc draftCR Rel-15  
 36.331 14.4.0 B LTE\_UDC-Core  
 R2-1713311 Selection of Pre-defined Dictionary for UDC Ericsson CR Rel-15 36.323  
 14.4.0 0212 - B LTE\_UDC-Core  
 R2-1713312 Pre-Defined Dictionary Configuration for UDC Ericsson CR Rel-15 36.331  
 14.4.0 3183 - B LTE\_UDC-Core  
 R2-1713769 Introduction of UDC checksum error handling MediaTek Inc draftCR Rel-15 36.323  
 14.4.0 B LTE\_UDC-Core  
 R2-1712809 Introduction of Operator controlled dictionary for UDC MediaTek Inc CR Rel-15  
 36.323 14.4.0 0208 - B LTE\_UDC-Core Withdrawn  
 R2-1712810 Introduction of Operator-defined dictionary for UDC MediaTek Inc CR Rel-15  
 36.331 14.4.0 3147 - B LTE\_UDC-Core Withdrawn  
 R2-1712811 Introduction of UDC checksum error handling MediaTek Inc CR Rel-15 36.323  
 14.4.0 0209 - B LTE\_UDC-Core Withdrawn

☒ **[100#26][LTE/UDC] Running 36.323 CR (CATT)**  
 - Update the running CR according to the agreements from this meeting  
 Intended outcome: endorsed running CR  
 Deadline: Thursday 2017-12-14  
 => Endorsed in R2-1714278

☒ **[100#27][LTE/UDC] Running 36.331 CR (CATT)**  
 - Update the running CR according to the agreements from this meeting  
 Intended outcome: endorsed running CR  
 Deadline: Thursday 2017-12-14  
 => Endorsed in R2-1714279

## 9.17 Further enhancements to CoMP for LTE

*(feCOMP\_LTE-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Mar. 18: WID: RP-171031)*

*Time budget: 0.5 TU*

*Documents in this agenda item will be handled in a break out session*

R2-1712641 Introduction of further enhancements to CoMP Intel Corporation discussion Rel-15  
 feCOMP\_LTE-Core



- Huawei think we cannot reuse Class B FD-MIMO (beamformed) CSI Process
- Huawei think we should wait RAN1 feedback for capability issue.

**Agreement:**

- 1 Introduce the enhancement CoMP including QCL type C and CSI feedback enhancement in RRC specification.

R2-1712642	Introduction of further enhancements to CoMP 36.331 14.4.0 B feCOMP_LTE-Core => Postponed to next meeting	Intel Corporation	draftCR Rel-15
R2-1712643	Introduction of further enhancements to CoMP 36.306 14.4.0 B feCOMP_LTE-Core => Postponed to next meeting	Intel Corporation	draftCR Rel-15
R2-1712897	Support of FeCoMP in TS 36.331 Huawei, HiSilicon - B feCOMP_LTE-Core	CR	Rel-15 36.331 14.4.0 3148

## 9.18 Other LTE Rel-15 WIs

*This agenda item may be used for documents relating to Rel-15 WIs with no allocated RAN2 time but which might have minor RAN2 impact (e.g. CT/SA WIs for which we have received an LS requesting RAN2 action)*

R2-1713523	Control Plane latency reduction B TEI15	Ericsson	CR	Rel-15 36.306 14.4.0 1540 -
R2-1713524	Control Plane latency reduction B TEI15	Ericsson	CR	Rel-15 36.331 14.4.0 3187 -
R2-1713525	Control Plane latency reduction	Ericsson	discussion	Rel-15 TEI15

## 9.19 LTE TEI15 enhancements

*Small Technical Enhancements affecting LTE Rel-15 that do not belong to any Rel-15 WI.*

*Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!*

*Time budget: 1 TU*

### *CP latency reduction:*

R2-1713525	Control Plane latency reduction - Huawei think the spec impact is small and proposals are acceptable. => Noted	Ericsson	discussion	Rel-15 TEI15
R2-1713925	LTE Control Plane Latency Reduction ☞ <b>CB on Friday:</b> => Draft LS in R2-1714087 to RAN1 and RAN to ask the feasibility of CP latency reduction (offline 150, Vodafone)	Vodafone Group plc	discussion	
R2-1713926	[DRAFT] LS on LTE Control Plane Latency Reduction To:RAN1	Vodafone	LS out	Rel-15 TEI15
R2-1713523	Control Plane latency reduction B TEI15	Ericsson	CR	Rel-15 36.306 14.4.0 1540 -
R2-1713524	Control Plane latency reduction B TEI15	Ericsson	CR	Rel-15 36.331 14.4.0 3187 -

### *High speed dedicated network:*

R2-1713255	Solutions for UE camping in high speed railway scenario Rel-15 TEI15 R2-1709000 => Noted - OPPO would like to know how UE know whether it is on the train or not. - Intel think MSE can be used to identify the UE state. - Nokia wonder the HSDN is dedicated carrier. - CMCC point that it is not dedicated carrier but is dedicated optimised for high speed trains.	CMCC, MediaTek Inc	discussion	
R2-1712616	Cell reselection for the UE on high-speed-dedicated network discussion Rel-15 TEI15 => Noted	Intel Corporation, CMCC		

**Agreements:**

- 1 Indication in SIB to indicate if the cell is a "high-speed-railway dedicated LTE network" (HSDN) is needed. Whether to introduce new indication or reuse the existing indication is FFS. FFS how to indicate HSDN neighbouring cell.
- 2 A cell can indicate the number of equivalent cells for speed state estimation in system information. The value range of number is FFS.
- 3 When the UE is in high speed state, higher priority to reselect HSDN cell than normal cell. How to handle the frequency priority and the speed priority is FFS. Other conditions for UE to choose higher priority is FFS
- 4 When the UE is not in high speed state, higher priority to reselect normal cell than HSDN cell. Other conditions for UE to choose higher priority is FFS. How to handle the frequency priority and the speed priority is FFS

- R2-1713256 Support of accurate UE speed-level estimation and speed-level-based cell (re)selection  
CMCC CR Rel-15 36.331 14.4.0 3181 - F TEI15
- R2-1712875 Considerations on Cell Reselection in High Speed Railway Scenario CATT discussion

*Inbound mobility:*

- R2-1713575 Inbound mobility to the shared non-CSG small cells SoftBank, Nokia, Nokia Shanghai Bell  
discussion Rel-15 TEI15 R2-1711006  
=> Noted  
=> It will be discussed with specific solution next meeting.

*New measurement for MDT:*

- R2-1713257 Introduction of new measurement collection in MDT CMCC discussion Rel-15 TEI15  
- Huawei support the enhancement.  
- Nokia think there is security issue to report MAC address.  
- CMCC indicate that the WLAN measurement for positioning purpose.  
=> Introducing WLAN/BT measurements and corresponding collection procedure in MDT framework should be addressed by new WI.  
=> Noted
- R2-1713258 Introduction of new measurement collection in MDT CMCC CR Rel-15 36.306  
14.4.0 1537 - B TEI15
- R2-1713259 Introduction of new measurement collection in MDT CMCC CR Rel-15 36.331  
14.4.0 3182 - B TEI15  
Rel-15 TEI

*Bearer and LCID extension:*

- R2-1712951 FGI20 limitation for DRBs Ericsson discussion Rel-15 TEI15
- R2-1712952 Avoiding FGI20 limitation for DRBs Ericsson CR Rel-14 36.306 14.4.0 1522  
- C TEI14
- R2-1712953 Avoiding FGI20 limitation for DRBs Ericsson CR Rel-14 36.331 14.4.0 3151  
- C TEI14
- R2-1712198 Further considerations on extended number of dedicated radio bearers for E-UTRAN  
Samsung discussion Rel-15 TEI15
- R2-1712957 Number of DRBs in E-UTRA Ericsson discussion Rel-15 TEI15
- R2-1712955 LCID space extension Ericsson discussion Rel-15 TEI15
- R2-1712956 LCID space extension Ericsson CR Rel-15 36.321 14.4.0 1195 - C  
TEI15
- R2-1713709 Introduction of the extended number of bearers Samsung draftCR Rel-15 36.321  
14.4.0 B TEI15
- R2-1713711 Introduction of the extended number of bearers Samsung draftCR Rel-15 36.331  
14.4.0 B TEI15

*New L2 measurement:*

- R2-1712708 Overview on new LTE measurements Huawei, HiSilicon, China Telecom discussion  
Rel-15 TEI15 R2-1710912

- => Noted
- R2-1713450 Considerations on new LTE eNB measurements requirements Nokia, Nokia Shanghai Bell  
discussion Rel-15 TEI15  
- Ericsson think new measurement on number of active UEs is needed.  
=> Noted
- R2-1712709 Discussion on new measurement on PRB usage distribution Huawei, HiSilicon, China  
Telecom discussion Rel-15 TEI15 R2-1710913  
=> Noted.  
=> Introduce new measurements or finer granularity for the existing measurements to address SA5 requirement.
- [100#35][LTE/new L2 measurements](Huawei)**  
Identify the solution to address SA5 requirement  
Intended outcome: agreeable CR if needed  
Deadline: Thursday 2018-02-08
- R2-1712710 Discussion on new measurement on IP throughput distribution Huawei, HiSilicon, China  
Telecom discussion Rel-15 TEI15 R2-1710914
- R2-1712711 Introduction of new measurement on PRB usage distribution Huawei, HiSilicon, China  
Telecom CR Rel-15 36.314 14.0.0 0045 - B TEI15
- R2-1712712 Introduction of new measurement on IP throughput distribution Huawei, HiSilicon, China  
Telecom CR Rel-15 36.314 14.0.0 0046 - B TEI15
- R2-1713460 Introduction of PRB usage distribution measurement and IP Throughput usage distribution  
Ericsson CR Rel-15 36.314 14.0.0 0047 - B TEI15
- R2-1713461 PRB Usage Distribution and IP Throughput Distribution Ericsson discussion Rel-15
- R2-1713905 Discussion on new measurements on number of active UEs China Telecommunications  
discussion
- R2-1713908 Introduction of new measurement on number of active UEs China Telecommunications CR  
Rel-15 36.314 14.0.0 0048 - B TEI15
- MBMS notification:*
- R2-1713425 Enabling MBMS Bearer Event Notification Ericsson CR Rel-15 36.300 14.4.0 1082  
- F MBMS\_LTE\_enh2-Core
- SRS antenna switching:*
- R2-1713681 Enhancement of SRS antenna switching in TS 36.331 Huawei, HiSilicon CR Rel-15  
36.331 14.4.0 3195 - B TEI15
- R2-1713683 Enhancement of SRS antenna switching in TS 36.306 Huawei, HiSilicon CR Rel-15  
36.306 14.4.0 1541 - B TEI15

## 10 WI: New Radio (NR) Access Technology

(NR\_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-172115)

### 10.1 Organisational

*Incoming LSs, work plan, status from other groups, etc.*

*Liaisons to RAN2*

- R2-1712102 FURTHER INFORMATION RELATED TO DRAFT NEW REPORT FOR IMT-2020 EVALUATION  
ITU-R WP 5D LS in To:RAN2  
=> Noted
- R2-1712105 LS on requirements on unified access control for 5GS (C1-174626; contact: LGE) CT1 LS in  
Rel-15 5GS\_Ph1-CT To:SA1, RAN2 Cc:SA2  
- Ericsson have a draft response in R2-1712534  
=> Noted

- R2-1712108 Response LS to RAN2 on jumbo frames (S3-172515; contact: Ericsson) SA3 LS in Rel-15 NR\_newRAT-Core To:RAN2  
=> Noted
- R2-1712109 Reply LS on Reply LS on 5GS Security aspects seeking resolution (S3-172517; contact: Ericsson) SA3 LS in Rel-15 5GS\_Ph1 To:SA2, RAN2  
=> Noted
- R2-1712113 LS on Supportable RNTI Length on DCI (R1-1719094; contact: Ericsson) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
- Samsung understand there is no performance impact but to 17 but 21 there might be some impact.  
- Ericsson understand they will conclude a single value. Ericsson have contribution in R2-1713487  
=> C-RNTI length will be discussed in common session.  
=> Noted
- R2-1712118 LS on NR Paging Mechanisms (R1-1719164; contact: Huawei) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
=> Noted
- R2-1712126 Reply LS on RACH agreements (R1-1719214; contact: CATT) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
=> Noted
- R2-1712128 LS on system information broadcast for CU/DU split scenario (R3-174199; contact: CATT) RAN3 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1  
- Vivo ask if the DU has an RRC layer. CATT understand that this is the assumption in RAN3 that it is encoded in DU but is transmitted from the CU.  
- LG understand that this has not impact on our specifications.  
- OPPO wonder if DU responds to on demand requests or whether it is CU.  
=> Noted
- R2-1712129 LS on Centralized Retransmission Solution (R3-174219; contact: Ericsson) RAN3 LS in Rel-15 NR\_newRAT-Core To:RAN2  
- Ericsson confirm this is for NR-NR DC.  
- AT+T have a contribution for how to address this for NR-NR DC.  
=> Noted
- R2-1712130 LS on length of NR Cell Identity (R3-174229; contact: Nokia) RAN3 LS in Rel-15 NR\_newRAT-Core To:RAN2  
- Vivo wonder if there is impact on the resume ID.  
- OPPO ask if this is relevant to EN-DC. Nokia understand that it is only in SIB1 so only for SA.  
=> Noted
- R2-1712132 LS on MN-initiated SN change for delta signalling (R3-174233; contact: Nokia) RAN3 LS in Rel-15 NR\_newRAT-Core To:RAN2  
- Intel ask if this is just the SCG config or also for the radio bearer config. Nokia understand that it is just the SCG config.  
- ZTE think this is already taken into account in the latest stage 2. RAN2 will need to check what we want to convey in the stage 3 details.  
=> Noted
- R2-1712136 LS on single Tx switched UL (R4-1711610; contact: Apple) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1, RAN3  
- Vodafone ask if there will be a table of problem channel combinations. Apply understand a formula will be used for channel combination within a problem band combination. But for problem BCs that will be a table.  
=> Noted

- R2-1712137 LS on mmWave UE NC CA capability signalling (R4-1711623; contact: Qualcomm) RAN4 LS in Rel-15 NR\_newRAT To:RAN2  
=> Noted
- R2-1712140 LS reply to subcarrier alignment (R4-1711859; contact: Huawei) RAN4 LS in Rel-15 NR\_newRAT To:RAN1, RAN2  
=> Noted
- R2-1712141 LS reply on NR UE baseband capabilities signalling (R4-1711888; contact: Intel) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1  
=> Noted
- R2-1712143 LS on gaps for SS block measurement in NR (R4-1711940; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:RAN2 Cc:RAN1  
- AT+T ask if the SSB is outside the active BWP also covers the case that the SSB is on a different carrier. Ericsson doesn't know what was considered but assume it applies in all cases.  
- Samsung ask if RAN4 is only working on per UE gaps.  
=> Noted
- R2-1712144 LS to RAN1 and RAN2 on Definition of synchronous and asynchronous Dual connectivity in Rel-15 LTE-NR combinations (R4-1711965; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN1, RAN2  
- Huawei ask if RAN4 have taken into account 1tx. Ericsson think RAN4 assume that it can work in all sync cases.  
- Vodafone wonder if async is only for non collocated case. Ericsson think that even in co-located case that async operation may be used.  
=> Noted
- R2-1712149 LS on default values for 5GS QoS averaging window for standardised 5QIs (S2-178049; contact: Qualcomm) SA2 LS in Rel-15 5GS\_Ph1 To:SA4, RAN2, SA6 Cc:CT1  
- Nokia think the default values do not make sense, they are way too long. They should be of the same length as a PDU.  
- Ericsson have a similar concern in case the traffic is very bursty.  
- Nokia think we can send a quick reply on this.  
=> Offline discussion to draft a response to SA2 on the average window length. R2-1714012 (Offline discussion #04, Nokia)
- R2-1714012 [DRAFT] [Response LS on R2-1712149 to SA2] Nokia LS out Rel-15 NR\_newRAT-Core To:SA2  
=> Replace " radio delay requirement " with "radio portion of the packet delay budget"  
=> Approved in R2-1714245
- R2-1712150 Reply LS on SDAP header design (S2-178056; contact: MediaTek)SA2 LS in Rel-15 5GS\_Ph1 To:RAN2  
- MediaTek think we need to discuss whether to send a single bit for both AS and NAS functions or send 2 bits. This LS says that 1 bit is not possible.  
- Ericsson think we could send a quick LS now. Intel think LS may not be needed as we anyway need to address the SA2 requirements.  
- CATT think there are approaches that make one bit work.  
=> Needs to be considered in the UP session (most likely not this meeting but Jan ad hoc)  
=> Noted
- R2-1712158 Reply LS on unified Access Control for 5G NR (S2-178191; contact: LGE) SA2 LS in Rel-15 SMARTER, 5GS\_Ph1, 5GS\_Ph1-CT To:CT1, SA1, RAN2  
=> Noted
- R2-1712298 Reply LS on details of network identifiers (C4-175291; contact: Qualcomm)CT4 LS in Rel-15 5GS\_Ph1-CT To:RAN2, SA2  
=> Noted

R2-1713952 LS Reply to 3GPP SA2 on Status Icon related to 5G GSM Association LS in SA2, RAN2 SA, SA1, RAN, CT1, CT  
 - Vodafone think the LS states in what conditions the 5G bit must be able to be set.  
 - DT think that GSMA also talk about detection of NR cells as well as relying on the bit which is not in line with our previous discussions.  
 => People can consider offline if there is anything from this LS that affects what we need to do in RAN2.  
 => Noted

R2-1713940 LS on RRC parameters for NR RAN WG 1 LS in  
 - Ericsson point out that these are not yet captured in the output of the email discussion but they are working on an update. Ericsson think the changes are very significant (50% more parameters)  
 => Noted

*Liaisons with RAN2 in CC*

R2-1712125 Response LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR (R1-1719211; contact: Intel) RAN1 LS in Rel-15 5GS\_Ph1, NR\_newRATTo:SA2, RAN4 Cc:RAN2  
 => Noted

R2-1712156 Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity (S2-178182; contact: Qualcomm) SA2 LS in Rel-15 EDCE5 To:CT1, SA3 Cc:CT4, RAN2, RAN3  
 - Intel think we should look as solutions that do not change our previous agreements.  
 Qualcomm think that CT1 have some alternatives to avoid MME impact so RAN2 don't need to take actions.  
 - Ericsson have a similar view to Intel. Some SA3 solutions to avoid MME impact have radio impact.  
 => Noted

R2-1712300 Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity (C4-175349; contact: Ericsson) CT4 LS in Rel-15 EDCE5 To:CT1, SA3 Cc:SA2, RAN2, RAN3  
 => Noted

R2-1713933 Reply LS on default values for 5GS QoS averaging window for standardised 5QIs (S4-171363; contact: Qualcomm) LS in SA4  
 - Qualcomm think we need to consider this in our response.  
 => Noted

R2-1712157 Reply LS on NR Edge Computing (S2-178185; contact: Nokia) SA2 LS in Rel-15 NR\_newRAT To:RANCc:SA, RAN2, RAN3  
 => Noted

R2-1712131 Reply LS on UE/RAN Radio Information and Compatibility Request (R3-174231; contact: Nokia) RAN3 LS in Rel-15 NR\_newRAT-Core To:SA2 Cc:RAN2

R2-1712133 LS on handling concurrent running of security procedures (S3-172565; contact: Ericsson) SA3 LS in Rel-15 5GS\_Ph1 To:RAN3 Cc:RAN2

R2-1712134 LS reply on Support for fake gNB detection mechanisms (R4-1711318; contact: Ericsson) RAN4 LS in Rel-15 NR\_newRAT To:SA3 Cc:RAN1, RAN2

R2-1712139 LS to RAN5 cc RAN1 and RAN2 on UE beamlock function (R4-1711823; contact: Keysight)RAN4 LS in Rel-15 FS\_NR\_test\_methods To:RAN5 Cc:RAN1, RAN2

R2-1712145 LS on PRB grid in the NR (R4-1711972; contact: Nokia) RAN4 LS in Rel-14 NR\_newRAT-Core To:RAN1 Cc:RAN2, RAN3  
 => LSs above are noted without presentation.

*New LS in (during RAN2#100)*

R2-1714112 LS on NR Idle Mode procedures (S1-174294; contact: Qualcomm) SA1 LS in Rel-15 5GS\_Ph1-CT SA2, RAN2, CT1 RAN3  
 New Ls in  
 => Noted

- R2-1714114 Reply LS on QCIs for EPC based ULLC (S1-174513; contact: Vodafone) SA1 LS in Rel-15 NR\_newRAT-Core, LTE\_HRLLC, LTE\_sTTIandPT, EDCE5 SA2, RAN, RAN1 RAN2, RAN3, SA4, CT4  
New Ls in  
=> Noted
- R2-1714137 LS on EDCE5 Algorithm Indication between UE and SgNB (S3-173444; contact: Vodafone) SA3 LS in Rel-15 EDCE5 To:CT1, CT4, RAN2, RAN3 Cc:SA2  
New Ls in  
=> Noted
- R2-1714140 "LS on NR TDD UL/DL configurations and support of HPUE (R1-1721560; contact: Softbank, Sprint)" RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN4 Cc:RAN1  
New Ls in  
=> Noted
- R2-1714145 LS on NR RMSI TTI (R1-1721557; contact: CATT) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
New Ls in  
=> Noted
- R2-1714155 LS on required information for NSA on X2 (R3-174964; contact: Nokia) RAN3 LS in Rel-15 NR\_newRAT-Core To:RAN1, RAN2, RAN4  
New Ls in  
=> Noted
- R2-1714167 Reply LS on maximum data rate of user plane integrity protected data SA3  
- Ericsson wondered if this also applies to LTE connected to 5GC.  
- Qualcomm think they don't care much about the difference between LTE and NR requirements.  
- Sharp consider that 64 kbit/s is ok for voice. Qualcomm also think it is more than enough.  
=> Noted
- R2-1714161 Reply LS on SPS and Grant-free (R1-1721574; contact: NTT DOCOMO) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
- Nokia think the DL SPS we could have shorter values than LTE.  
=> This has been considered in the UP session  
=> Noted
- R2-1714162 LS on RAN1 agreement on UL power sharing for LTE/NR NSA operation (R1-1721606; contact: Intel) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
=> Noted
- R2-1714164 LS on RRC parameters for NR (R1-1721616; contact: Ericsson) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2  
=> Noted
- R2-1714189 LS on SRS PHR reporting (R1-1721680; contact: Huawei)  
=> Treated in UP session
- R2-1714201 LS reply on SSTD measurements for EN-DC (R4-1714289; contact: Ericsson)  
=> Noted
- R2-1714236 LS on MAC CE parameters for NR MIMO (R1-1721663; contact: NTT DOCOMO) RAN1 LS in  
=> Noted
- RAN2 in Cc:*  
R2-1714171 LS reply on support of Trace and MDT in NG-RAN in rel-15 (S5-176477; contact: Nokia) SA5 LS in Rel-15 NR\_newRAT-Core To:RAN3, CT4 Cc:RAN2

=> Noted

*Rapporteur inputs*

R2-1712305 RAN WG's progress on NR WI in the October meeting 2017 NTT DOCOMO, INC.

(Rapporteur) discussion Rel-15 NR\_newRAT-Core

=> Noted

## 10.2 Stage 2 and common UP/CP aspects

*Proposals to the stage 2 should be submitted with a TP to show the impact to the stage 2 specifications.*

### 10.2.1 Stage 2 TSs and running CR

*Latest TS 38.300, TS 37.340 and running CR to 36.300, other rapporteur inputs, anything related to specification methodology. Please submit any new text proposals to the appropriate agenda item.*

R2-1712266 Draft TS 38.300 v120 Rapporteur (Nokia) draft TSRel-15 38.300 1.2.0 NR\_newRAT-Core

=> Noted

R2-1712356 NR Stage 2 Clean Up Rapporteur (Nokia) discussion Rel-15 NR\_newRAT

=> Noted

R2-1712357 NR Stage 2 Open Issues Rapporteur (Nokia) discussion Rel-15 NR\_newRAT

=> Noted

R2-1712355 Draft TS 38.300 v121 Rapporteur (Nokia) draft TSRel-15 38.300 1.2.1 NR\_newRAT-Core

=> Revised in R2-1714079 to capture agreements from this meeting (Offline discussion #11)

R2-1714079 Draft TS 38.300 v122 Rapporteur (Nokia) draft TSRel-15 38.300 1.2.2 NR\_newRAT-Core

☒ **[100#15][NR] 36.800 (Nokia)**

Intended outcome: Agreed TS for submission to RAN for approval

Deadline: Thursday 2017-12-07

=> Agreed in R2-1714252.

R2-1712301 TS 37.340v120 Rapporteur (ZTE Corporation) draft TSRel-15 37.340 1.2.0 NR\_newRAT-Core

=> Noted

R2-1712303 List of FFSs for MR-DC with 5GC Rapporteur (ZTE Corporation) discussion Rel-15

=> Noted

R2-1712302 Draft TS 37.340v121 Rapporteur (ZTE Corporation) draft TSRel-15 37.340 1.2.1 NR\_newRAT-Core

- Ericsson wonder if we should say anything about duplication in NR PDCP. ZTE explain NR PDCP is covered in 38.300.

- Ericsson wonder why the security key text is changed in section 9. ZTE think the change aligns to what we have agreed.

=> Revised in R2-1714080 to capture agreements from this meeting (Offline discussion #12)

R2-1714080 Draft TS 37.340v122 Rapporteur (ZTE Corporation) draft TSRel-15 37.340 1.2.2 NR\_newRAT-Core

☒ **[100#16][NR] 37.340 (ZTE)**

Intended outcome: Agreed TS for submission to RAN for approval

Deadline: Thursday 2017-12-07

=> Agreed in R2-1714251.



R2-1712304 Draft 37.340CR to introduce NR-NR DC Rapporteur (ZTE Corporation) pCR Rel-15  
 37.340 1.2.0 NR\_newRAT-Core  
 => Noted

## 10.2.2 User Plane

*No documents should be submitted to 10.2.2. Please submit to 10.2.2.x.*

### 10.2.2.1 Bearer type harmonisation

*Any remaining stage 2 aspects relating to bearer type harmonisation  
 This agenda item is relevant to EN-DC completion and standalone operation.  
 Maximum 1 tdoc per company*

*2c/2x*

R2-1712890 Stage2 TP to update bearer type description ZTE Corporation, Sanechips discussion Rel-15

- Ericsson think this approach would result in a minor update to the specifications but it would be better to make a more fundamental update based on our harmonised bearer agreements.
- Intel have a similar view to Ericsson. SCG split bearer to denote 2x is not very clear as the SCG leg is optional.
- ZTE concern is that there will be a big impact in stage 3 in RAN3. They are currently not aligned to our flexible configuration approach. Also this would allow the 2c approach which we think is not needed at all, and we should not add things because they are possible. Finally want to avoid different meanings in LTE DC and MR-DC.
- DOCOMO have sympathy with Ericsson and Intel.
- Huawei think we don't need to change our current definitions nor introduce 2x. We left the 2x decision to RAN3.
- Vodafone think the stage 2 should reflect our agreements and think the terminology update from Ericsson would be useful. Qualcomm support the Ericsson approach to reflect the harmonised bearer in stage 2. CATT agree with Ericsson for terminology but for 2x we should wait for RAN3 conclusion.
- Samsung understands ZTE concern but their update is very confusing, hence support Ericsson. Nokia also have sympathy for Ericsson approach.
- ZTE think if we don't have 2x there is no need to make any update.
- Intel think the terminology should be fixed even if RAN3 don't conclude on 2x/2c.

=> Wait for RAN3 to make final decision.  
 => Offline discussion to progress if and how we want to update the terminology to better align to our harmonised bearer agreements (Offline discussion #13, Intel)  
 => Revised in R2-1714183 to capture the outcome of the discussion in the TP

R2-1714165 Offline discussion on Bearer type redefinitions Intel corporation (rapporteur) report Rel-15 NR\_newRAT-Core

#### **Agreements**

1: it is proposed to agree on Option 1: From R2-1712669 and R3-1713906:

- MCG bearer: in MR-DC, a bearer with RLC bearer only in the MCG.
- SCG bearer: in MR-DC, a bearer with RLC bearer only in the SCG.
- Split bearer: in MR-DC, a bearer with RLC bearers in both SCG and MCG.
- MN terminated bearer: in MR-DC, a bearer for which PDCP is located in the MN.
- SN terminated bearer: in MR-DC, a bearer for which PDCP is located in the SN.

2: 2x/2c (i.e., MN terminated SCG bearer and SN terminated MCG bearer) are supported in stage 2.

R2-1714183 Stage 2 TP to update bearer type description ZTE

R2-1713560 On Reconfiguration to option 2c/2x for SCG addition/modification and SCG Failure NTT DOCOMO INC. discussion Rel-15 NR\_newRAT-Core

*Other*

- R2-1713906 TP for 37340 - Introducing bearer harmonization Ericsson, Samsung discussion Rel-15 NR\_newRAT-Core
- R2-1712669 Terminology for RBs in EN-DC Intel Corporation discussion Rel-15 NR\_newRAT-Core

**Agreements**

- 1 Define a term to denote the lower layer (RLC+MAC logical channel) configuration.
- 2 Use the term "RLC bearer"

- R2-1713151 Discussion on PDCP version change Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

**Agreements:**

- 1 The change from NR PDCP to LTE PDCP for MCG SRBs is only supported via release/addition at handover.
- 2 The change from NR PDCP to LTE PDCP for MCG DRBs is only supported via release/addition at handover.

- R2-1713728 RLC UM support for split bearers in MR-DC NEC discussion Rel-15 NR\_newRAT-Core
  - LG think this is the assumption used for the stage 3 definition.

**Agreements**

- 1: RAN2 to confirm the split bearers (DRBs) support the RLC UM in MR-DC.

*Withdrawn*

- R2-1713434 TP for 37340 - Introducing bearer harmonization Ericsson discussion Rel-15 NR\_newRAT-Core Withdrawn
- R2-1713901 TP for 37340 - Introducing bearer harmonization Ericsson, Samsung discussion Rel-15 NR\_newRAT-Core Withdrawn

### 10.2.2.2 Bearer type change

*This agenda item is relevant to EN-DC completion and standalone operation. Maximum 1 tdoc per company.*

*Late*

- R2-1713836 L2 handling for bearer type change covering option 2x/2c NTT DOCOMO, INC. discussion Rel-15 NR\_newRAT-Core

### 10.2.2.3 Other

*Any remaining stage 2 user plane aspects - detailed topics should be discussed in stage 3 user plane. This agenda item is relevant to EN-DC completion and SA.*

- R2-1712325 Discussion on the handling 2 for UM DRB and SRB Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
  - moved from 10.2.2.2 to 10.2.2.3*
  - P1
    - CATT think this is already captured in stage 2 spec for both UM DRBs and SRBs. Ericsson think it is covered in stage 3 also according to proposal1 .
  - P2
    - LG think we can just rely on re-establishment but without a key change. DOCOMO agree with LG. Ericsson thinks it becomes confusing to re-establishment for some bearers but not for others. Also the re-establishment will reset the COUNT and so key must be changed.
    - OPPO think the network configuration can solve this.
    - Nokia think if we have to re-establish then we will not be able to support HO without key change.

**Agreements**

1 For handling 2 (i.e. no PDCP re-establishment) of SRBs, PDCP should discard all stored SDUs and PDUs.

R2-1713435 PDCP handling in case of PSCell change Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1713378 Open issues on switched mode on split bearers Nokia, Nokia Shanghai Bell discussion  
Rel-15 NR\_newRAT  
P2

- Lenovo think that it would be similar if RLC re-establishment and PDCP data recovery is always performed.
- MediaTek think a simple common behaviour should be performed.
- LG think we can reuse the existing indicators in the reconfiguration message.
- Ericsson also think we can just reuse the indicators and then there is no impact to the UP.

**Agreements**

1: RRC Connection Reconfiguration that switches the uplink path can explicitly indicate (using existing indicators) whether the UE, for a given split bearer, shall perform re-establishment of an RLC and PDCP data recovery.  
FFS How this is handled in the case of pre-processing for UM-RLC (to be discussed in UP session)

R2-1713838 Bearer type change with PDPC version change NTT DOCOMO INC. discussion Rel-15

- LG think we should not discuss this again.
- Nokia support the proposal and think the signalling in RRC could already support this so no need for a restriction in stage 2. Ericsson have the same view and think there is not restriction in stage 3.
- Qualcomm also support the proposal. ZTE also support.
- DOCOMO understand a single message would include a remove an add with a PDCP version change. Intel also think there is nothing in RRC that prevents this.

**Agreements**

1 Support 1-step (direct) bearer type change with PDCP version change (i.e. reverting the agreement in RAN2#99bis).

R2-1713876 Control of UL Split or Duplicate MCG SRB Samsung Electronics GmbH discussion R2-1711774

- LG support proposal 1.
- Intel support the proposal to avoid having the address the question of what to do at SCG failure.
- Huawei support the proposal. OPPO also support . Vivo also.
- Ericsson think we previously agreed to support all the cases. This case can be used to avoid power sharing issues. Nokia have similar view to Ericsson and think re-establishment should be triggered if there is SCG failure.
- ZTE also support the proposal.
- CATT share the Ericsson and Nokia view but the SCG failure case can be discussed further. IDC also share this view.
- Ericsson understand that for Dec 17 we should support SCG only or MCG only, and it is only duplication that is not supported.

P2

- ZTE support the proposal. LG think duplication is not useful for SRB.
- => Support of SRB duplication for CA can be discussed after December.

R2-1712917 Number of supported DRBs in NR (16/32) Ericsson discussion Rel-15 NR\_newRAT-Core

- Samsung explain that the NR LCID field has 64 values and hence has enough flexibility that we don't need to conclude the number of DRBs now.

- Ericsson wonder what value should be included in the NR RRC spec. Samsung think that we could already have enough space in the RRC signalling for 32 DRBs.
- Samsung think the SA2 discussion is only related to EPC.
- => DRB ID space in NR RRC is 32 (same as LTE).

R2-1713731	NR data rates effects on the UE and networks 15 NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-15
	<ul style="list-style-type: none"> <li>- Samsung think this is a valid issue but it is difficult to make any agreement.</li> <li>- MediaTek wonder if flow control is that big an issue as there is a flow control at TCP</li> <li>- Qualcomm agree in the past we have always agreed that flow control is not needed, but with 5G data rates we might need to reconsider. TCP reaction is very slow and cannot resolve the problem.</li> <li>- Qualcomm can agree the observations but the TP is not suitable for the TS. Also wonders if 3GPP can resolve this is data is discarded by upper layers.</li> </ul>			
	=> Offline discussion to try to conclude whether this is an issue that we should aim to address in future meetings (Offline discussion #14, Qualcomm)			
	- Update from offline: No conclusion how to progress.			
R2-1713148	Secondary RAT data volume report NR_newRAT-Core R2-1711093	Huawei, HiSilicon	discussion	Rel-15
R2-1712908	Remaining issues for RoHC in NR and EN-DC 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1712909	Consideration on PHR in EN-DC Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1713464	Activation and Deactivation time of Secondary Cells 15 NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1713465	[DRAFT] LS on Activation and Deactivation time of Secondary Cells out Rel-15 NR_newRAT-Core To:RAN4		Ericsson	LS
R2-1713612	Support of ECN in NR 15 NR_newRAT-Core	Ericsson, Nokia, Nokia Shanghai Bell, Vodafone	discussion	Rel-15

*Withdrawn*

R2-1713585	NR data rates effects on the UE and networks 15 NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-15
R2-1713837	Bearer type change with PDPC version change 15 Withdrawn	NTT DOCOMO INC.	discussion	Rel-15

### 10.2.3 Impact of bandwidth parts

*Any remaining stage 2 aspects relating to bandwidth parts for EN-DC, noting that it was agreed last meeting to discuss BWP impact to standalone operation after Dec 17. Detailed topics should be addressed under the appropriate UP or CP stage 3 AI.*

*This agenda item is relevant to EN-DC completion.*

*Maximum 1 tdoc per company*

R2-1712322	BWP issues for EN-DC completion NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
	<p>P1</p> <ul style="list-style-type: none"> <li>- ZTE wonder what initial BWP means for connected, and wonder if we need to define any initial BWP.</li> <li>- MediaTek think we don't need to consider initial BWP at this stage.</li> <li>- Qualcomm think the initial BWP still needs to be defined for EN-DC</li> <li>- Samsung think these terms used by RAN1 may not be appropriate for our discussion. We can refer to BWP configured by RMSI instead of initial BWP.</li> <li>- IDC share the view of ZTE.</li> </ul> <p>P3</p> <ul style="list-style-type: none"> <li>- CATT think that the UE should not have to switch BWP to perform RACH and the network will not be aware and hence there will be data loss. Hence RACH should be available on every BWP.</li> <li>- LG share the view with CATT.</li> <li>- Huawei think that if there are RACH resources on all BWPs it still doesn't work. The network doesn't know the DL BWP on which RAR should be sent.</li> </ul>			

- IDC think the network should be able to choose which BWPs have RACH resources.
  - LG think we also need to consider the CSI-RS RACH resource.
  - MediaTek think that RAN1 will conclude on the RACH resource relation to BWP.
  - Ericsson think a single RACH config is ok for BWPs that are subset of each other. For other cases where the UE BW is less than carrier BW then the different BWPs will need common search space and hence could have RACH resources.
- => Offline discussion to conclude the relation between RACH resources and BWPs, and also what BWP types (e.g. initial, default, etc) are needed from RAN2 point of view. (Huawei, Offline discussion #15). Discussion should focus on what is required for EN-DC operation for Dec 17.

R2-1713885	Remaining control plane issues of BWP 15 NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-
R2-1713729	Clarifications on BWP set configuration	NEC	discussion	Rel-15 NR_newRAT-Core
R2-1713733	BWP and RLM in NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1712250	Discussion on configuration and mobility about BWP operation	OPPO	discussion	
R2-1712275	Delta signaling of BWP	Spreadtrum Communications	discussion	Rel-15
R2-1712601	Discussion on the RAN2 impacts with the BWP terminologies introduced in RAN1	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1712646	Overall impact in RAN2 for BWP	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1712759	BWP impact on idle inactive mode vivo		discussion	Rel-15 NR_newRAT-Core
R2-1712795	Control Plan Impacts of BWP	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1712863	BWP selection in handover	CATT	discussion	
R2-1712883	Text Proposal to support BWP Operation in 38.300	MediaTek Inc.	discussion	
R2-1712990	BWP impact on RRM Measurements for Wideband CC	Sony	discussion	Rel-15 NR_newRAT-Core
R2-1713567	Discussion on the impact of bandwidth parts in MN/SN coordination			ITRI discussion NR_newRAT-Core
R2-1713865	Remaining aspects to support bandwidth part	Samsung	discussion	Rel-15
R2-1713568	Bandwidth part configuration during SN addition procedure	ITRI	discussion	NR_newRAT-Core

*moved from 10.2.4 to 10.2.3*

## 10.2.4 MN/SN measurement coordination

*Any remaining stage 2 aspects relating to MN/SN measurement coordination.  
Further detail discussion of the measurement object parameters that can be configured differently without affecting whether the 2 measurement objects will count as 1 or 2 measurement layers, please use stage 3 agenda item 10.4.1.4.1.  
This agenda item is relevant to EN-DC completion.  
Maximum 1 tdoc per company*

R2-1712439	Measurement coordination for EN-DC	ZTE CORPORATION	discussion	Rel-15 NR_newRAT-Core
R2-1713137	Measurement coordination for LTE-NR DCHuawei,	HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712242	Measurement Gap Coordination in EN-DC	OPPO	discussion	

*Withdrawn*

R2-1712813	Coordination of Parameters for Measurements Report Trigger		Fujitsu	discussion	Rel-15 NR_newRAT-Core
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Withdrawn

## 10.2.5 MN/SN procedures for EN-DC

*Any remaining stage 2 aspects relating to MN/SN procedures for EN-DC  
Details of the content of inter node RRC messages should be progressed in stage 3 AI 10.4.1.9.  
This agenda item is relevant to EN-DC completion.  
Maximum 1 tdoc per company*

*Cell index*

R2-1712855	Cell Index in EN-DC	CATT	discussion	
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*moved from 10.2.9 to 10.2.5*  
P1

- Vivo wonder if the cell index could be used for per CC measurement gaps.
- LG support the proposal. Qualcomm also support.

P2

- LG think that in future there could be multiple secondary nodes and it would be good to avoid coordination between the nodes for this purpose.
- ZTE think that coordination could be useful. Also think P3 hints about MN informing SN about remaining indexes. CATT think the hard split could be hard coded in the spec of informed by the MN and then the SN selects from its set without MN involvement.

P3

- Nokia would like to support renegotiation so that the SCellIndex space can be kept small and use the smaller format. Ericsson think these agreements don't have direct impact to the choice of PHR format to be used.
- ZTE think the MN decision is per UE as it can depend on UE capability.

#### Agreements

- 1 No change to previous agreements that the UE includes ARFCN and PCI of the NR serving cells are used to identify the NR serving cell measurements. SCellIndex is not used for this purpose.
- 2 SCellIndex is unique in the UE (i.e. across NR and LTE SCells)
- 3 Each node allocates SCellIndex for its own cells (from a set of SCellIndices available to that node) without involvement of the other node at the time of allocation of the SCell
- 4 MN decides the SCellIndex range available for MN and SN, and informs the SN range to the SN. This is a per UE configuration.

=> Offline discussion for stage 3 details to be captured in the inter-node RRC message. (Offline discussion #05, CATT).

R2-1714170 Offline discussion #05: stage3 details to be captured for SCellIndex coordination CATT

#### Agreements

- 1: The MN provides the SN the range of SCellIndex to be used by signalling a start value and a stop value if the range. 32 SCellIndex range is used between the MN and the SN. The UE uses "Dual Connectivity PHR MAC Control Element supporting 32 serving cells with configured uplink" for PH reporting.

R2-1712441	Consideration on the Coordination of SCell Index in EN-DC discussion Rel-15 NR_newRAT-Core	ZTE CORPORATION
R2-1713431	Serving Cell Index across Cell Groups Ericsson discussion Rel-15 NR_newRAT-Core <i>moved from 10.2.9 to 10.2.5</i>	
R2-1712998	Discussion on the SCell index vivo, Xiaomi, CATR, TCL discussion Rel-15 NR_newRAT-Core <i>moved from 10.2.9 to 10.2.5</i>	

Other

R2-1713149	Remaining issue on SRB3 establishment Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core	
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- Intel think the SK counter should also be signalled to the UE at time of SCG setup. Huawei think that without this counter the SCG bearer cannot be setup.
- ZTE think the SK counter should always be provided and then the SN can make the decision to setup SRB3. So we don't need to change the agreement.
- Ericsson think we already agreed the SN makes the decision to setup SRB3. We could also have the case that the SN requests the key from the MN when needed.
- LG think the previous agreement doesn't need to be changed.
- Huawei clarify that the MN can always provide the SK counter and security capability to the SN, so we don't want to change the previous agreement. CATT also support the MN always provides this information. Nokia also have this understanding.
- Ericsson think this was also discussed in RAN3.
- LG suggest that SRB3 and SCG anchored DRN could be linked to resolve the problem

**Agreement:**

- 1 The MN should always provide SK counter to the UE and SKgNB and security capability to SN at SN addition (even if no SCG anchored bearers are setup) in order to enable SRB3 to be setup based on SN decision.

- R2-1712251 Discussion on SCG RRC reconfiguration failure on SRB3 OPPO discussion  
 R2-1712310 SN change/addition during handover HTC Corporation discussion  
 R2-1713436 Race conditions in case of SCG change Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1713782 NR UE Capability Size Reduction LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1711420

*Withdrawn*

- R2-1712271 BWP Switch Impact on MN/SN procedures Spreadtrum Communications discussion  
 Rel-15 Withdrawn

## 10.2.6 Security for EN-DC

*Any remaining stage 2 aspects relating to security for EN-DC.*

*This agenda item is relevant to EN-DC completion.*

- R2-1712468 TP for Usage of user plane integrity protection Qualcomm Incorporated, Panasonic, Samsung, MediaTek Inc., Lenovo, Motorola Mobility discussion Rel-15
- ZTE think this is related to non EN-DC. Have a paper in R2-1712611 submitted to a different agenda item proposing that it would be a capability.
  - LG think if we agree it can be captured in the stage 2 but don't think a capability is needed.
  - Nokia would prefer no limit from network point of view but can accept it. But think 64kbps is too low. And also think that a capability is needed to enable UEs to do better.
  - ZTE think the very low bit rate will preclude some applications.
  - Huawei also think a capability is useful.
  - Qualcomm would be ok to have a capability. May need to think about some averaging window for this.
  - LG think the some CN signalling can be used instead of a radio capability.
  - MediaTek think capability would be a simple way to achieve this. The averaging discussion can wait.
  - Ericsson agree that this mainly for IoT use cases but it is difficult now to fix to certain bit rates. Need to know what was discussed in SA3.
  - Qualcomm expect that the network will schedule the integrity protected data to meeting this requirement.
  - Intel think the network need to know when the DRB is setup what the likely maximum data rate will be in order to decide whether IP can be setup.

**Agreements**

- 1 UE capability to be added for the maximum aggregate data rate per UE of user plane integrity protected data for DRBs.
- 2 Lowest possible value for the data rate is XX kbps

=> Offline discussion to conclude the XX value to be indicated in the LS

=> Inform SA3 cc SA2 of our decision and ask them if the lowest maximum data rate value is acceptable for the uses cases they were considering. Draft LS in R2-1714076 (Offline discussion #07, Qualcomm)

Following discussion of SA3 response LS:

=> XX = 64 kbit/s. UE capability signalling will also support values above 64 kbit/s up to the maximum supported bit rate of the UE.

=> Agreement to be captured in TS 38.306.

- R2-1714076 [DRAFT] LS on maximum data rate of user plane integrity protected data Qualcomm LS  
 out Rel-15 NR\_newRAT-Core To:SA3 Cc:SA2  
 => Change DRB to DRBs

- => Change question to SA3 for "Does SA3 see any problem with the RAN2 agreed lowest possible value for the user plane integrity protected data rate"
- => Approved in R2-1714125

R2-1714166 TP for the maximum data rate of user plane integrity protection Qualcomm Incorporated pCR  
Rel-15 38.300 NR\_newRAT-Core

R2-1712697 UE security algorithm capability signalling in EN-DC Intel Corporation discussion  
Rel-15 NR\_newRAT-Core

P1

- DOCOMO think it the first proposal can be confirmed then it will simplify things. Wonder is from UE perspective whether all the NR algorithms can be supported.
- ZTE think we cannot decide that UE has to support the same algorithms. Qualcomm think that if in future we support an LTE only algorithm then it will cause problems.
- Intel clarify that this proposal is just for the existing algorithms and not new ones, for which there would be an MME update anyway.
- Ericsson can agree with the proposals. Qualcomm think CT1 is discussing this as well.
- Intel explain the intent is not to prevent NAS from adding signalling but that if the NAS is not updated then the RAN can rely on just the LTE capabilities. Lenovo have the same understanding as Intel and think this was clarified by SA3.

#### Agreements

- 1 EN-DC UE shall support the NR algorithms (nea0/1/2/3 and nia0/1/2/3) corresponding to the LTE algorithms (eea0/1/2/3 and eia 0/1/2/3) signalled at NAS. This agreement does not apply to future algorithms that may be added to LTE or NR.
- 2 There is no need to signal the UE NR AS Security capability over LTE RRC.
- 3 Mapping from LTE security algorithms (provided over S1) to corresponding NR security algorithms (where necessary) is performed at eNB.

- => Draft LS to SA2, CT1 and SA3 with RAN2 decisions, for verification and consideration in their specifications. R2-1714077 (Offline discussion #08, Intel)

R2-1714077 [DRAFT] Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity Intel LS out Rel-15 NR\_newRAT-Core To:SA2, CT1, SA3

- => Approved in R2-1714124

R2-1713379 Possibility of NR PDCP COUNT wrapping around Nokia, Nokia Shanghai Bell discussion  
Rel-15 NR\_newRAT

- ZTE had the same understanding as Nokia when this was agreed that COUNT can wrap but not with the same key.
- LG think we agreed COUNT will not wrap and hence network needs to release and add the DRB to avoid he problem. Lenovo think there will be data loss with this.
- ZTE wonder what was the issue in the user plane. LG explain the issue is in the complexity of PDCP procedures to check for the wrap around. Also it is not exactly the same as LTE so we can't just reuse the LTE approach.
- OPPO think that this could be the same as LTE and can be addressed by reconfiguring the DRB ID without key change.
- Samsung think PDCP compares absolute values of count and this will not work if count wraps.
- LG also think COUNT wrap is very rare so changing the previous agreement would be an optimisation for a rare case.
- Nokia think this an artificial limitation. Nokia think that SN can only request release of DRB and MN doesn't know why.

- => RAN2 confirm previous agreement that COUNT does not wrap around.

- => Offline discussion on the MN/SN interaction to avoid a COUNT wrap in SN. (Offline discussion #09, Nokia)

- Update from offline discussion from Nokia. Majority of companies want to stay with current agreements



R2-1712430	Use of two security keys in the same network node discussion	Rel-15 NR_newRAT-Core	Lenovo, Motorola Mobility
R2-1712539	UE handling requirement for integrity on DRBs	15	Huawei, HiSilicon discussion Rel-
R2-1713138	UP integrity protection check failure handling in LTE-NR DC discussion	Rel-15 NR_newRAT-Core	Huawei, HiSilicon
R2-1713396	Handling of UP integrity protection failure	Core	Ericsson discussion Rel-15 NR_newRAT-

## 10.2.7 Single Tx

*Any remaining aspects for single tx operation, including capability signalling and TDM pattern coordination (NOTE: Conclusion of discussion with RAN3 chair is that TDM pattern coordination will be discussed first in RAN2)*

*Including output from email discussion [99bis#15][NR] Capability of signalling for 1 tx (Nokia)*

*UE capability*

R2-1713168	Report of email discussion 99bis#15	Core P1	Nokia (rapporteur) report Rel-15 NR_newRAT-
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- Nokia think this re-introduces per BC bits that we try to avoid. Also think it ties the RAN2 and RAN4 specifications more tightly than the other approach.
- Vodafone think there will no mechanism to indicate problem channel allocations.
- DOCOMO tend to agree with Nokia. We are trying to avoid putting bits into the BC signalling.
- Vivo think the bit should be included in the BC signalling and also this is consistent with the RAN4 LS.
- OPPO think based on LS from RAN and RAN4 the per BC indication is the simplest way.
- Apple think the proposal is aligned with the RAN4 agreements which says the capability is per BC. RAN4 will define a formula for channel combinations within a BC. Apple also think this is pure RF capability and hence not related to BPC.
- Qualcomm think there is a problem with the fallback combinations to avoid them being signalled. We need a solution for this. Ericsson is ok with this for sake of progress but think we need to address the fallback combination issue.
- T-Mobile think a per BC bit is the right way to go but think we need to allow fallback combinations and also some channel indications per BC.
- Intel also support per BC bit and for fallback mechanism we need to have a general discussion.
- Huawei share Intel's view and the fallback solution needs to be discussed.
- LG also support the per BC signalling.

### Agreements

- 1: RAN2 to adopt per-BC capability bit for SUO. The bit applies to all fallback BCs that are defined in RAN4 as problematic BCs. The bit does not apply to fallback BCs that are defined in RAN4 as not problematic BCs. Hence the UE does not explicitly list the fallback BCs.
- 2: UE is only allowed to set the per-BC capability bit for those band combinations that are defined in RAN4 as problematic BCs

R2-1712282	Discussion on UE capability signaling for 1TX transmission	NR_newRAT-Core	ZTE Corporation, Sanechips
R2-1712847	Capability design for single UL transmission	Core	Apple discussion Rel-15 NR_newRAT-

*TDM pattern*

R2-1713209	TP on LTE RRC for supporting single UL transmission	Rel-15 NR_newRAT-Core	Huawei, HiSilicon discussion
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- Apple think only the reference UL/DL configuration is necessary. Huawei explain this is their intent and it can be clarified.
- Ericsson ask if the reference UL/DL config is the same as the TDD configuration. ZTE think it is a bit different as the special subframe is considered as DL.

### Agreements

- |   |   |
|---|---|
| 1 | The reference UL/DL configuration (0 to 6) and HARQ_offset (0 to 9) should be configured to UE in case the UE is configured with EN-DC and simultaneous transmission on LTE UL and NR UL is not supported.<br>=> Stage 3 details to be added to the 36.331 CR can be progressed offline |
|---|---|

- R2-1712850 LTE impact of single UL transmission Apple discussion Rel-15 NR\_newRAT-Core
- Huawei is not sure that a capability is needed. If UE indicates it needs 1tx then it could be mandatory that the UE supports case 1.
  - Apple explain that case 2 does not need UE support and hence no capability is needed.
  - ZTE think for case 2 the network still needs to indicate a pattern to the UE as the patterns need to be aligned. Nokia think case 2 is that nothing is signalled to the UE. Ericsson also think case 2 is up to network implementation how to avoid the simultaneous transmission on LTE and NR. Also think that case 1 could be an optional feature but maybe RAN1 should decide.
  - Qualcomm also understand that case 2 relies on network scheduling but wonders how it works for UE initiated signalling such as RACH. Intel understand that case 2 relies fully in network and this includes the RACH configuration but if there is a collision it could be left to UE implementation.
  - Samsung assume the capability may not be needed.
- P3
- Apple think the definition of the HARQ RTT Timer needs to be updated.

<b>Agreements</b>
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- |   |   |
|---|---|
| 1 | HARQ RTT Timer should be updated to reflect the case 1 which is based on the HARQ/scheduling timing according to dl-reference UL/DL configuration (i.e.tdd-Config-v15). |
|---|---|

- R2-1713684 TDM pattern coordination for 1Tx and Harmonic scenario vivo discussion Rel-15 NR\_newRAT-Core
- ZTE think exactly the same procedure could be applied for the 2 cases.
  - ZTE think we could define a container over X2 that carries the same IE as provided to the UE in the case 2 case.
  - Nokia also agree the same approach should be used but don't think an inter-node message helps as what is exchanged between nodes is not what is sent over the radio to the UE.
  - Ericsson think the harmonic issue has some additional FDM coordination and think RAN3 can discuss all the required cases.
  - Apple suggest to focus on the 1TX case and then see if it can be used for the harmonic issue. Also think thinks this is a UE specific pattern so it is reasonable to use an inter-node message.
  - Intel think the TDM pattern coordination can be treated separately. The only case bot are needed is that the BC has both harmonic and 1 tx issue.
  - Huawei prefer that this is carried on Xn interface.
  - Ericsson think the information is not sent to the UE, but only to inform the node how to schedule the UE. Also the information will need to be provided to the DU. Also the harmonic case requires time and freq coordination but 1tx is a subset of this

<b>Agreements</b>
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- |   |  |
|---|--|
| - | RAN2 assume that RAN3 will progress the topic of TDM pattern coordination for 1Tx. |
|---|--|
- => Can discuss offline what addition guidance can be given to RAN3 about the TDM pattern for 1Tx case.  
=> Draft LS to RAN3 to inform them of our decision. R2-1714078 (Offline discussion #10, Apple)

- R2-1714078 [DRAFT] LS on TDM pattern coordination for single UL operation Apple LS out Rel-15 NR\_newRAT-Core To:RAN3
- => Remove " and complete the work in this meeting " from the action.  
=> Add statement to the first paragraph that "It is up to RAN3 to define the signalling and whether the same mechanism is used to address the harmonic issue"  
=> Approved in R2-1714129

R2-1712370	LTE-NR coordination for RF coexistence	Qualcomm Incorporated	discussion	Rel-15
	NR_newRAT			
R2-1713167	Finalization of SUO for EN-DC	Nokia, Nokia Shanghai Bell	discussion	Rel-15
	NR_newRAT-Core			
R2-1712281	Discussion on single TX transmission and solution	ZTE Corporation, Sanechips	discussion	
	NR_newRAT-Core			
R2-1712696	TDM pattern for single UL Tx	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1712848	TDM pattern coordination for single UL transmission	Apple	discussion	Rel-15
	NR_newRAT-Core			
R2-1713347	single Tx operation and HARQ timing	Ericsson	discussion	Rel-15 NR_newRAT-Core
	Core			
<i>Other</i>				
R2-1712849	Stage-2 TP for single UL transmission	Apple	discussion	Rel-15 NR_newRAT-Core
R2-1712985	Single and simultaneous UL on problematic channels	Sony	discussion	Rel-15
	NR_newRAT-Core			
R2-1714238	Stage-2 TP for single UL transmission	Apple	discussion	Rel-15 NR_newRAT-Core
	=> Noted.			

## 10.2.8 Supplementary uplink

*Any remaining stage 2 aspects for SUL operation, including any joint CP/UP aspects. Contributions on stage 3 aspects should be submitted in the corresponding stage 3 AIs.*

R2-1713208	Discussion paper on procedures for supporting SUL	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
	P3			
	- Intel think this approach is feasible but wonder what happens of the UE selected UL carrier is different from the network selected carrier.			
	- ZTE wonder for which cases the threshold based selection should be used. Think for HO, SCG change and PDCCH order the network should control the carrier. For SR case the UE would be configured which UL carrier to use. LG have the same understanding so the threshold is only needed for idle mode, and in connected the network can control the carrier.			
	- Vivo wonder if the UE can configure dedicated RACH on more than one UL.			
	- Qualcomm support the proposal and the UE should be ready to receive RA from either UL.			
	- IDC think the threshold should be used in cases that the network is not able to received SRS in advance of the random access.			
	- OPPO think that the threshold based should be used.			
	- ZTE think there may be cases in connected where the threshold is needed.			
	- Nokia think the RAN1 LS was that threshold should be used for contention based. Huawei agree this was the intention of RAN1. Intel think the RAN1 LS was focussed on initial access and doesn't comment on connected mode. Think both approaches can work and given that PUCCH and SRS are semi statically configured then RA could be configured in this way.			
	- Ericsson think we could just configure RA on a single SUL carrier. In the time available it would be easier if just one UL has RA resources. ZTE think the RA resource on both carriers is already agreed in RAN1.			
	- CATT think the resources will be needed for idle and hence they will also be there for connected.			
	- CMCC think the threshold approach also gives some information to the network which carrier is good for the network to use.			
	- Qualcomm think it should be possible to use resources on the higher frequency carrier when possible to reduce load on the lower frequency SUL.			
	P6			
	- OPPO think the network should be able to configure 2 sets of RA resources and the UE chooses even for CFRA. CATT have the same view.			
	P9			
	- Intel do not see the need for per UL PHR as only UL one is used at a time and also the DL pathloss is the same for both carriers. DOCOMO share the same view.			
	- Huawei think even without simultaneous transmission we still have dynamic scheduling.			

- Vivo think we still have PUCCH and PUSCH on different carriers at the same time.
- Qualcomm think the per carrier PHR is needed. This is needed for DCI based uplink switching.
- LG think even with DCI based switching the per carrier is not needed as the network know which carrier is used.
- CATT think the network has all the information to derive what it needs for the other carrier.

**Agreements for connected mode operation:**

- 1 Random access resources (including PRACH and common PUSCH configuration just for the RA procedure) can be configured on both the UL and the SUL carrier.
- FFS: Whether common PUCCH configuration is also needed for the connected mode case.
- 2 For contention based RA, if the network does not explicitly tell the UE which carrier to use, the UE shall perform UL selection based on the RSRP threshold as initial access.
  - 3 For contention free RA, the network explicitly indicates to the UE which UL carrier to used (e.g. in PDCCH order or via dedicated RRC RACH configuration) (For PDCCH order case RAN1 needs to make final decision if the carrier can be indicated in the DCI)
  - 4 SUL specific configuration should also be carried in the inter node messages for EN-DC and handover cases.
  - 5 RRC configuration can include PUSCH, SRS and power control info per UL carrier, and dedicated PUCCH for a single UL carrier.
- FFS: What combination of configuration per carrier are allowed.
- 6 Per UL PHR reporting is not supported in this release.

Offline discussion to try to progress the FFS points. (Offline discussion #16, Huawei)

R2-1714173 offline discussion report for SUL remaining issues Huawei

**Agreements:**

- 1: Common PUCCH configuration can be included in the common configuration in the RRC dedicated signalling.
- 2: The UL differentiation (i.e. indication of SUL and UL) in DCI is predefined
- 3 In RRC signalling separate UL configuration and SUL configuration structures as they both only represent up to one UL configuration. The setupRelease structure can be used to indicate addition/modification/removal for each UL.
- 4: Confirm the RRC configuration as in the table in the paper (the BWP parts should follow the agreements from the BWP discussion)

R2-1712675	Random Access in SUL	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1712805	Control Plane Impacts of SUL => MAC CE based switching of the UL carrier will not be supported	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1712277	Discussion on initial access for SUL	ZTE Corporation, Sanechips	discussion		NR_newRAT-Core
R2-1712247	Discussion on RACH issue and UE capability for SUL operation => revised to R2-1713946		discussion	OPPO	NR_newRAT-Core
R2-1713946	Discussion on RACH issue and UE capability for SUL operation		discussion	OPPO	NR_newRAT-Core
R2-1712278	Discussion on configuration of uplink channels for SUL carrier	ZTE Corporation, Sanechips	discussion		NR_newRAT-Core
R2-1712760	RACH resource selection for SUL	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1712836	On the procedures for SUL	Samsung	discussion		NR_newRAT-Core
R2-1712999	Remaining stage-2 issues of SUL carrier for EN-DC => revised to R2-1713955		discussion	vivo, CATR	NR_newRAT-Core
R2-1713955	Remaining stage-2 issues of SUL carrier for EN-DC		discussion	vivo, CATR	NR_newRAT-Core
R2-1713706	Support of SUL in EN-DC and Standalone NR HO	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core

- R2-1713810 On the impact of supplementary uplink on HARQ configurations discussion Qualcomm Incorporated  
 Rel-15 NR\_newRAT-Core
- R2-1713847 The Impact of SUL on UL Transmission without Grant discussion Samsung Electronics

Late

- R2-1713628 Discussion on remaining SUL issues for EN-DC discussion Ericsson Rel-15  
 NR\_newRAT-Core

## 10.2.9 EN-DC - other aspects

*Any remaining stage 2 aspects. Contributions should include a TP to show how the stage 2 specification would be impacted (if no stage 2 spec impact then the contribution should be submitted to an appropriate stage 3 AI)  
 This agenda item is relevant to EN-DC completion.*

- R2-1713150 Clarification on duplication SRB in EN-DC Huawei, HiSilicon discussion Rel-15  
 NR\_newRAT-Core R2-1711091

=> Covered by previous discussion.

- R2-1713251 Consideration on the PSCell Change and SCG Change in EN-DC ZTE Corporation, Sanechips  
 discussion Rel-15 NR\_newRAT-Core
- CATT think if PDCP recover needs to be performed for split bearers then the MN will need to be involved.
  - Ericsson think in some cases MN is not involved
  - ZTE understand that RAN3 would also have to use a different terminology instead of SCG change.

### Agreement

1: The PSCell Change included in the SN Modification procedure should be specified clearly in TS 37.340, i.e. in EN-DC:

The PSCell change without security key change can be performed via SN initiated SN Modification with or without MN involvement procedure (depending on the case);

FFS: For which cases it is possible to perform the PSCell change without MN involvement

The PSCell change with security key change should be performed via SN initiated SN Modification with MN involvement procedure.

2: The concept of "SCG Change" should be removed in TS 37.340 (replacement term could be e.g. SN security refresh)

=> TP to be updated in R2-1714122 (Offline discussion #19)

=> Draft LS to RAN3 in R2-1714123 to inform them of our decisions (Offline discussion #19, ZTE)

- R2-1714122 Consideration on the PSCell Change and SCG Change in EN-DC ZTE Corporation, Sanechips  
 discussion Rel-15 NR\_newRAT-Core

=> Revised in R2-1714176 to address comments received

=> Offline discussion to consider whether we need to add an SN to NM indication to enable the SN to request the MN to perform PDCP data recovery

- R2-1714176 Consideration on the PSCell Change and SCG Change in EN-DC ZTE Corporation, Sanechips  
 discussion Rel-15 NR\_newRAT-Core

=> TP is agreed

- R2-1714123 [DRAFT] LS on replacement of "SCG change" with "SN Security Refresh" indication ZTE  
 LS out Rel-15 NR\_newRAT-Core RAN3

- Intel think we need to inform RAN3 that there is an indication from SN to MN to trigger the PDCP data recovery.

=> Revised LS in R2-1714147

- R2-1714147 [DRAFT] LS on replacement of "SCG change" with "SN Security Refresh" indication ZTE  
 LS out Rel-15 NR\_newRAT-Core To:RAN3

=> Approved in R2-1714169

- R2-1712613 Handling of EN-DC with suspend/resume ZTE Corporation, Sane Chips discussion Rel-15

- Intel thinks the latest RRC CR addresses this. The SCG configuration is always released for re-establishment and resume. For the radio bearer configurations they need to be kept and the MN can keep them or reconfigure them at re-establishment. For suspend case there are more cases that need to be discussed.
  - Ericsson think it is important to keep the PDCP configuration of the bearer.
  - Samsung think that for release 13 suspend the S1 connection is released completely so why is this needed.
  - Ericsson think in R13 the SCG config is released when the UE resumes, but now for R15 we can keep the bearer configuration but release the SCG configuration. Intel think this is sufficient from the UE point of view.
  - Samsung think keeping the bearer configuration only makes sense if the S1 is kept.
- => Noted

- R2-1712695 Support of measurements on legacy RATs for EN-DC Intel Corporation discussion  
Rel-15 NR\_newRAT-Core
- Qualcomm understand that RAN4 have not got this agreement. If voice is ongoing then it would be needed to keep measurements for legacy RATs ongoing. Also think that it is not just for RAN4 to decide this. Intel agree that it is a surprising decision in RAN4 and the aim is to raise awareness.
  - Ericsson think from RAN2 point of view we should support the measurements. Although RAN4 may not have performance requirements for these measurements.
- => Noted
- R2-1712248 Discussion on the data available for BSR calculation due to DRB IP OPPO discussion  
R2-1712249 Discussion on the data recovery due to DRB IP failure OPPO discussion  
R2-1713398 Discussion and Stage 2 TP on Race conditions in case of SN release Ericsson  
discussion Rel-15 NR\_newRAT-Core
- R2-1713490 Considerations on fast access inter-site small cells in NR Nokia, Nokia Shanghai Bell  
discussion Rel-15 NR\_newRAT-Core R2-1711004
- R2-1713594 ANR framework in NR Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1713595 TP on ANR to 36.300 Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1713773 Remaining issues on suspension to INACTIVE in MR dual connectivity Samsung Electronics  
discussion
- R2-1713801 Power management by cross-RAT signaling in NSA configuration Qualcomm Incorporated  
discussion Rel-15 NR\_newRAT-Core R2-1711701

*Withdrawn*

- R2-1712272 Text Proposal for Stage 2 on SN initiated SN Modification in TS37.340 Spreadtrum  
Communications discussion Rel-15 Withdrawn
- R2-1713169 Considerations on fast access inter-site small cells in NR Nokia, Nokia Shanghai Bell  
discussion Rel-15 NR\_newRAT-Core Withdrawn

## 10.2.10 Mobility mechanisms - basic handover

*Any remaining stage 2 aspects of basic handover (and not common to SCG change for EN-DC). Contributions should include a TP to show how the stage 2 specification would be impacted (if no stage 2 spec impact then the contribution should be submitted to an appropriate stage 3 A)*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

- R2-1712408 TP for on-demand SI acquisition during HO PANASONIC R&D Center Germany  
discussion Rel-15
- R2-1712506 Further discussion on information for handover Huawei, HiSilicon discussion Rel-  
15 NR\_newRAT-Core R2-1710262
- R2-1712603 Discussion on the support of MBB and RACH-less in NR ZTE Corporation, Sane Chips  
discussion Rel-15 R2-1710430
- R2-1712822 Further issues on basic handover procedure Fujitsu discussion Rel-15 NR\_newRAT-  
Core
- R2-1712885 TP on Basic HO Considering the FFS Issues MediaTek Inc. discussion R2-1710869  
R2-1712761 Remaining issues and TP for baseline handover procedurevivo discussion Rel-15  
NR\_newRAT-Core R2-1710932  
*moved from 10.2.9 to 10.2.10*

## 10.2.11 Mobility mechanisms - other

*Note decisions at RAN2#97bis to progress the basic HO mechanism and only when stable to discuss conditional handover and potential optimisations to target close to 0ms or 0ms interruption.*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712175	Ping Pong Issues for Conditional Handover R2-1710169	TCL	discussion	NR_newRAT-Core
R2-1712259	Mobility enhancements for NR NSA Core	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1712260	Mobility enhancements for NR SA	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1712503	Support for intra-frequency dual connectivity in NR	AT&T	discussion	
R2-1712508	3 Types of HO in NR R2-1710264	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712509	Further discussion on Conditional HO NR_newRAT-Core R2-1710265	Huawei, HiSilicon	discussion	Rel-15
R2-1712510	DC based NR scheme for 0ms interruption handover Rel-15 NR_newRAT-Core R2-1710266	Huawei, HiSilicon	discussion	
R2-1712511	Security key change without L2 reset NR_newRAT-Core R2-1710267	Huawei, HiSilicon	discussion	Rel-15
R2-1712512	DC for intra-frequency mobility in NR NR_newRAT-Core R2-1710268	Huawei, HiSilicon	discussion	Rel-15
R2-1712513	Mobility enhancements for PCell change NR_newRAT-Core R2-1710270	Huawei, HiSilicon	discussion	Rel-15
R2-1712514	Potential Advantages of multi-connectivity with multiple MAC entities within an NR cell Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1710271	
R2-1712515	Inter MN handover without SN change NR_newRAT-Core R2-1710272	Huawei, HiSilicon	discussion	Rel-15
R2-1712516	Allocation of appropriate RACH resources for handover Rel-15 NR_newRAT-Core R2-1710273	Huawei, HiSilicon	discussion	
R2-1712548	Automatic Neighbour Relation in NR 1710543	Huawei, HiSilicon	discussion	Rel-15 R2-
R2-1712604	Targeting a Lossless handover with 0ms interruption discussion Rel-15 R2-1710434	ZTE Corporation, Sane Chips		
R2-1712605	Discussion on single connected handover 15 R2-1710435	ZTE Corporation, Sane Chips	discussion	Rel-
R2-1712651	Handover optimization in NR for Rel 15 NR_newRAT-Core	Intel Corporation	discussion	Rel-15
R2-1712794	Conditional Reconfiguration for NR Core R2-1710669	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1712872	Mobility Enhancement for '0ms Interruption' HO Core R2-1710871	MediaTek Inc.	discussion	NR_newRAT-Core
R2-1712874	One or Multiple NR-Cells per MAC Entity R2-1710872	MediaTek Inc.	discussion	NR_newRAT-Core
R2-1712946	Discussion on Inter DU mobility	KT Corp.	discussion	
R2-1712950	Conditional handover in NR system 15 NR_newRAT-Core	Lenovo, Motorola Mobility	discussion	Rel-
R2-1712958	Discussion on conditional handover in NR	KT Corp.	discussion	R2-1710892
R2-1713402	0 ms interruption support during handover procedure in NR Rel-15 NR_newRAT-Core	Ericsson	discussion	
R2-1713403	RACHless HO in NR when UE is in CA or DC NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1713605	Enhancing Handover Failure	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713606	Conditional Handover	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713607	Conditional Handover Simulation Results Core	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713608	On Reliability, overhead and controllability aspects of Conditional Handover discussion Rel-15 NR_newRAT-Core	Ericsson		
R2-1713701	Handling of SRBs in connection re-establishment 15 NR_newRAT-Core R2-1711396	LG Electronics Inc.	discussion	Rel-
R2-1713747	Discussion on Conditional Handover in NRASTRI	TCL Communication Ltd.	discussion	

R2-1713783	DRB Handling while RRC Connection Re-establishment in NR discussion	Rel-15 NR_newRAT-Core	R2-1711419	LG Electronics Inc.
R2-1713820	Conditional handover procedure			LG Electronics Inc. discussion Rel-15 NR_newRAT-Core R2-1707134
R2-1713843	Conditional Handover: Event Design Aspects			Samsung Electronics discussion R2-1711600
R2-1713848	The Necessity of Fast RLF Recovery based on T312 in NR			Samsung Electronics discussion R2-1711599
R2-1713850	Discussion on intra-frequency DC as an aggregating solution and mobility solution			Samsung R&D Institute UK discussion
R2-1713853	Problem of DC enhancement for 0 ms interruption time discussion	R2-1711412	Withdrawn	Samsung R&D Institute UK
R2-1713854	Problem of DC enhancement for 0 ms interruption time discussion	R2-1711412		Samsung R&D Institute UK
R2-1713855	Introduction of Conditional handover			Samsung R&D Institute UK discussion R2-1711413 Withdrawn
R2-1713856	Introduction of Conditional handover			Samsung R&D Institute UK discussion R2-1711413
R2-1713857	Operational aspects of conditional handover mechanism discussion	R2-1711416		Samsung R&D Institute UK

### 10.2.12 Mobility - RLM,RLF

*Any remaining stage 2 aspects of radio link monitoring procedure and criteria for declaring radio link failure, including impact of beam failure/recovery based on responses from RAN1 to questions sent from last meeting.*

*Stage 2 for RLM/RLF for EN-DC is considered complete, and hence this agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Maximum 1 tdoc per company*

R2-1712238	Discussion on Detailed Issues for RLM			OPPO discussion
R2-1712276	Discussions on the IS and OOS counting procedure			Spreadtrum Communications discussion Rel-15
R2-1712559	RLF for NR	Huawei, HiSilicon		discussion Rel-15 NR_newRAT-Core
R2-1712753	RLM/RLF in NR	vivo		discussion Rel-15 NR_newRAT-Core R2-1710919
R2-1713588	Remaining open issues of RLM and RLF in NR			Ericsson discussion Rel-15 NR_newRAT-Core
R2-1713898	RLM RS type and L3 parameter differentiation			Samsung R&D Institute UK discussion

### 10.2.13 Mobility without RRC involvement

*AI is a placeholder for when RAN1 has made progress on beam management. Any RAN2 contributions should focus on the RAN2 implications as a consequence of RAN1 agreements - do not submit duplicates of RAN1 documents here.*

*This agenda item is relevant to EN-DC completion*

R2-1712561	Need for new MAC CEs for UL and DL beam management	Huawei, HiSilicon		discussion Rel-15 NR_newRAT-Core
	-			DOCOMO think RAN1 is still discussing and think they may send an LS. They may send it on Thursday.
	-			Samsung have the same view as DOCOMO. Think they will not conclude MAC CE for all of these. LG think that RAN1 might decide on DCI based signalling.
	-			Ericsson think in some cases it is clear that some MAC CEs will be needed.
	=>			Offline discussion to try get a common understanding of what RAN have agreed (and any information from ongoing discussion of RAN1) and what MAC CEs will need to be defined. Then draft LS to ask RAN1 to confirm the understanding. (Offline discussion #17, Ericsson) Initial list and final LS when ready will be seen and approved by UP session.
	-			Update from offline:
R2-1714243	DRAFT LS on MAC CEs for beam management and CSI			Ericsson => Approved in R2-1714246
R2-1713738	RRC configuration of CSI-MeasConfig			Ericsson discussion Rel-15 NR_newRAT-Core => Noted



R2-1713406 Discussion on the beam failure recovery impact on RAN2 ZTE Corporation discussion  
=> Revised to R2-1713954

R2-1713954 Discussion on the beam failure recovery impact on RAN2 ZTE Corporation discussion  
P2

- MediaTek think that it is not exactly CFRA but just uses a part of it. Nokia have the same view. We can agree to capture it in MAC but think it could be a separate section instead of into the same procedure.

P3

- MediaTek think this is agreed in RAN1 but it is good to have a clear RAN2 understanding
- LG think it needs to be addressed to RA-RNTI, cannot use C-RNTI and contention resolution is required. ZTE think this aspect was discussed in RAN1 and it can be done as these are contention free resources. Panasonic agree with ZTE.
- MediaTek explain it is a separate resource for beam recovery compared to other RA.
- ZTE explain this is only reserved on beams that the UE could potentially recover on.
- Ericsson wonder if in the SSB case why can't the UE recover on any beam. MediaTek think even in the case that the beam uses SSB then there is a dedicated resource for recovery.

P4

- Ericsson think that the UE should recover if it finds itself in a beam that is not indicated by the network. And it would be good for the UE to use CBRA for this purpose to avoid allocating dedicated resources.

P5

- Samsung support to have fallback to contention based resources.
- ZTE think the beam recovery mechanism is not used with CBRA. If CBRA was used there would be more signalling needed in order to recovery the beam.
- Ericsson think the most important case is to use the CBRA. Nokia also agree but this will be a bit different from what RAN1 have so far agreed. Ericsson think it could just be a CBRA with C-RNTI in msg3 and it might lead of a reconfiguration from the network.
- Panasonic think that RAN1 still have FFS on use of CBRA.
- LG would prefer to align with handover and hence fallback to CBRA.

=> UP session can discuss whether the RA for beam recovery is in a new section of included in the existing RA text.

#### Agreements

- 1 The reception of the gNB response to beam recovery request sent on RACH is based on the monitoring of a PDCCH addressed to C-RNTI within a time duration configured by RRC.
- 2 Beam recovery can take place on a candidate beam (e.g. beams above threshold) with dedicated PRACH resources either associated with an SSB or CSI-RS resource.  
FFS In which spec the criteria for a candidate beam for beam recovery is specified
- 3: When more than one beam is a valid candidate, it is up to UE implementation to select the beam.  
FFS Whether we need to configure candidate beams for recovery with a mixture of SSB based and CSI-RS resource based beams. Any RAN1 agreement on this can be checked  
FFS Behaviour in case the beam recovery attempt is not successful  
FFS Whether beam recovery is supported using CBRA.

=> Offline to try to progress the FFS points. (Offline discussion #18, ZTE)

=> Stage 3 TP to capture the agreements to be discussed in UP session.

R2-1714178 offline discussion#18 (on the beam failure recovery impact on RAN2) ZTE

#### Agreements

- 1: For beam recovery purposes RRC signalling allows the case of configuring both SSB + CSI-RS (i.e. simultaneously) for new candidate beam identification. The case where only one of SSB or CSI-RS resource is configured is also covered – i.e. this is network configuration.
- 2: When more than one beam is a valid candidate, it is up to UE implementation to select either the SSB based resource or the CSI-RS based resource.

R2-1713793 Beamformed NR C-DRX operation Samsung Electronics discussion

R2-1712213	Discussion on beam recovery request in NR NR_newRAT-Core R2-1711081	ASUSTeK	discussion	Rel-15
R2-1712407	UL resource configuration for the beam failure recovery discussion Rel-15	PANASONIC R&D Center Germany		
R2-1712562	Consideration on DRX with beam management 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1712563	Handling of resources for beam failure recovery 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-
R2-1712754	RACH configuration for beam recovery R2-1710920	vivo	discussion	Rel-15 NR_newRAT-Core
R2-1712871	Beam Management and Beam Recovery in MAC Core R2-1710870	MediaTek Inc.	discussion	NR_newRAT-
R2-1712959	Dedicated resource configuration for beam failure recovery discussion Rel-15 NR_newRAT-Core R2-1711370	Lenovo, Motorola Mobility		
R2-1713412	Beam Recovery in NR Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-
R2-1713414	Impact of beam management on RAN2 15 NR_newRAT-Core	Nokia, Nokia Shanghai Bell	discussion	Rel-
R2-1713688	Prioritized random access for beam failure recovery discussion Rel-15 NR_newRAT-Core R2-1711382	Lenovo, Motorola Mobility		
R2-1713734	Beam link monitoring in NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713792	Aperiodic indications due to Beam Recovery 1711713	Samsung Electronics	discussion	R2-
R2-1713796	NR signals for downlink beam management 1711721	Samsung Electronics	discussion	R2-
R2-1713797	RAN1 agreements based beam recovery procedure	Samsung Electronics	discussion	
R2-1713888	Beam recovery request R2-1711361	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1713890	Beam reporting and refinement during handover 15 NR_newRAT-Core R2-1711360	Qualcomm Incorporated	discussion	Rel-
R2-1713892	Beam management in C-DRX Core R2-1711348	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-
R2-1713894	Beam refinement after beam recovery or scheduling request discussion Rel-15 NR_newRAT-Core R2-1711363	Qualcomm Incorporated		
R2-1713910	UL resource allocation and usage for beam failure recovery	OPPO	discussion	
R2-1712870	MAC Functions to support Beam Management and Beam Recovery discussion <i>moved from 10.3.1.2 to 10.2.13</i>	MediaTek Inc.		
R2-1713533	MAC CEs for activating an RS resource and handling corresponding TCI states discussion Rel-15 NR_newRAT-Core <i>moved from 10.3.1.13 to 10.2.13</i>	Ericsson		
R2-1713818	Potential new MAC CE <i>moved from 10.3.1.13 to 10.2.13</i>	NTT DOCOMO INC.	discussion	Rel-15 NR_newRAT-Core

## 10.2.14 Mobility - Inter-RAT

*Connected mode mobility between NR and E-UTRA*

*Inter-RAT NR measurements to be added to E-UTRA for purpose of EN-DC should be discussed under stage 3 AI 10.4.2.  
Inter-RAT E-UTRA measurements to be added to NR for the purpose of inter-RAT handover from NR to -E-UTRA should be discussed under stage 3 AI 10.4.1.3.7*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712517	Inter-RAT handover between LTE and NR NR_newRAT-Core R2-1710566	Huawei, HiSilicon	discussion	Rel-15
R2-1712518	Message content in inter-RAT handover NR_newRAT-Core R2-1710567	Huawei, HiSilicon	discussion	Rel-15
R2-1713761	NR inter-RAT mobility to CSG cell	LG Electronics Inc.	discussion	Rel-15 R2-1711647
R2-1713920	Supporting Lossless Inter-RAT Handover	Samsung	discussion	

## 10.2.15 Security (non EN-DC)

*Stage 2 aspects of security for cases other than EN-DC*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1712438	DRB integrity check failure handling	ZTE CORPORATION	discussion	Rel-15	
	NR_newRAT-Core				
R2-1712538	Procedures for enabling security per bearer	Huawei, HiSilicon	discussion	Rel-15	
R2-1712545	Re-establishment upon integrity check failure	Huawei, HiSilicon	discussion	Rel-15	
	NR_newRAT-Core R2-1710346				
R2-1712546	[DRAFT] LS to SA3 on re-establishment upon integrity check failure		Huawei LS out	Rel-15	
	NR_newRAT-Core R2-1710347 To:SA3				
R2-1712547	"Integrity protection and Counter Check Procedure for NR UP"	Huawei, HiSilicon	discussion	Rel-15	
R2-1712611	Data rate restrictions for user plane integrity protection	ZTE Corporation, Sane Chips	discussion	Rel-15	
R2-1712755	Behavior on DRB IP check failure	vivo	discussion	Rel-15	NR_newRAT-Core R2-1710921
R2-1713278	Key refresh at handover in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713301	NR RRC States overview and remaining open issues	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713302	Need for MSG5 at RRC resume	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713305	Way forward with Security in RRC Inactive	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713306	Security for RRCConnectionResumeRequest message	Ericsson	discussion	Rel-15	NR_newRAT-Core

## 10.2.16 Slicing

*Including signalling of slice info to RAN, impact to access control, confirmation (or otherwise) of working assumption from RAN2#99 on use of dedicated prioritises to control idle mode mobility for slicing, etc*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1712226	Working Assumption Confirmation and Propose TP to TS 38.300 on Network Slicing	OPPO, Coolpaddiscussion	Rel-15	NR_newRAT-Core	R2-1710172
R2-1712350	Slice assistance information over RRC	Nokia, Nokia Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1712386	Further Discussion on Slice Selection Information over RRC		discussion	Rel-15	NR_newRAT-Core
R2-1712387	Slice-based Unified Access Control	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1712388	Slice Availability for Cell Reselection	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1712389	What is RAN part of a network slice ?	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1712405	Demerits of using Slice information for Cell selection	Lenovo Mobile Com. Technology	discussion	NR_newRAT-Core	R2-1710163
R2-1712410	Cell reselection based on slice availability	CATT	discussion		
R2-1712589	Leftover issues for NW slicing	ZTE Corporation, Sane Chips	discussion	Rel-15	R2-1710422
R2-1712756	UE registered slices information at gNB	vivo	discussion	Rel-15	NR_newRAT-Core
	R2-1710925				
R2-1712757	Cell selection/reselection with network slicing	vivo	discussion	Rel-15	NR_newRAT-Core
	R2-1711080				
R2-1712987	NSSAI in MSG5	Sony	discussion	Rel-15	NR_newRAT-Core R2-1711020
R2-1713232	Requested NSSAI in RRCMCC		discussion	Rel-15	NR_newRAT-Core
R2-1713276	Signalling aspects of network slicing	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713277	Slice availability	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713569	Cell reselection for network slicing	ITRI	discussion	NR_newRAT-Core	R2-1711762
R2-1713615	Slicing support and cell reselection	Qualcomm Incorporated	discussion		R2-1710785
R2-1713752	AMF selection based on assistance information	LG Electronics Inc.	discussion	Rel-15	R2-1711155
R2-1713866	Connected mobility aspects to support network slicing	Samsung	discussion	Rel-15	

R2-1713886	Initial Access considering Network Slices	Samsung Electronics GmbH	discussion	R2-1711779
R2-1713889	Slice Information in RRC	Samsung Electronics GmbH	discussion	R2-1711791

## 10.2.17 QoS

*Any remaining stage 2 aspects, including QoS operation with DC.*

*Detailed topics should be discussed in stage 3 user plane*

*Note agreement at RAN2#97bis that QoS flow remapping at handover will be discussed when flow remapping not at handover has been progressed within user plane session.*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1712162	On default DRB, default QoS flow and profile	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1712163	Further considerations on the number of DRBs and PDU sessions for NR	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1712358	Notification Control for GBR QoS Flows	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1712390	DRB Level Offloading in NR DC	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712391	Notification Control	Huawei, HiSilicon, CATT	discussion	Rel-15 NR_newRAT-Core
R2-1712608	Discussion on QoS flow-DRB remapping	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1712609	QoS remaining aspects for NR-NR DC	ZTE Corporation, Sane Chips	discussion	Rel-15 R2-1710440
R2-1712612	QoS flow to DRB mapping during HO for bearers using reflective QoS	Sane Chips	discussion	Rel-15 R2-1710441
R2-1712758	Lossless HO for QoS flow and DRB offloading	vivo	discussion	Rel-15 NR_newRAT-Core R2-1710926
R2-1712919	Analysis of the QoS framework (Stage 2)	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1712921	QoS Flow Relocation in NR-DC between MN and SN	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713852	Re-configuration scenarios for the NR QoS framework	Samsung	discussion	Rel-15 NR_newRAT-Core

## 10.2.18 Positioning

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1712382	Support of measurement gaps for location related inter-RAT measurements		discussion	Rel-15	Ericsson
R2-1712406	Text proposal for 38.305 skeleton	Ericsson	discussion	Rel-15	38.305
R2-1712471	Text Proposal for Clause 1 to 3 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT R2-1711045
R2-1712473	Text Proposal for Clause 4 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	R2-1711047
R2-1712474	Text Proposal for Clause 5 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	R2-1711048
R2-1712475	Text Proposal for Clause 6 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	R2-1711049
R2-1712476	Text Proposal for Clause 7 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	R2-1711051
R2-1712477	Text Proposal for Clause 8 of TS 38.305	Qualcomm Incorporated	discussion	Rel-15	R2-1711052
R2-1712540	Protocol impacts of positioning in NR	Huawei, HiSilicon	discussion	Rel-15	
R2-1713253	Support NR positioning under dual connectivity	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core

## 10.2.19 Stage 2 corrections

*This agenda item is for corrections to the draft stage 2 TSs. 'Corrections' means improvements to the way that existing agreements are captured in the TS, or addition of existing agreements that have been omitted (new agreements should not be proposed). In addition, such corrections should first be communicated to the specification rapporteur for possible inclusion in a rapporteur's update, and only submitted here if you conclude a separate contribution should be useful.*

*This agenda item is relevant to EN-DC completion and non EN-DC.*

- R2-1712359 QoS Update Rapporteur (Nokia) discussion Rel-15 NR\_newRAT  
=> Remove " In the downlink "  
=> Remove "only" in 2 places  
=> Revised in R2-1714230
- R2-1712687 Updates to stage 2 QoS flow Intel Corporation, Rapporteur (Nokia) discussion Rel-15 NR\_newRAT-Core  
=> Remove NAS from A.3 bullet 1  
=> TP is agreed with change above
- R2-1712168 Clarification for the MR-DC QoS framework Samsung pCR Rel-15 37.340 1.1.1 NR\_newRAT-Core  
=> Revised in R2-1714237
- R2-1714237 Clarification for the MR-DC QoS framework Samsung pCR Rel-15 37.340 1.1.1 NR\_newRAT-Core  
=> Agreed
- R2-1712324 Stage-2 TP for cell definition Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
=> Noted
- R2-1712360 BWP Description Rapporteur (Nokia), Huawei discussion Rel-15 NR\_newRAT  
=> TP is agreed
- R2-1712838 SUL Description Rapporteur (Nokia), CMCC discussion Rel-15 NR\_newRAT  
=> Remove " To improve UL coverage for high frequency scenarios, a Supplementary Uplink (SUL) can be configured (see 3GPP TS 38.101 [18]). "  
=> Move figure to the Annex.  
=> Do not remove PUSCH transmissions  
=> TP is agreed with the changes above
- R2-1713597 TP to stage-2 on measurements Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Noted
- R2-1713676 TP on capability coordination HTC Corporation discussion  
=> Noted
- R2-1713900 TP on UE triggered transition from RRC\_INACTIVE to RRC\_CONNECTEDvivo discussion Rel-15 NR\_newRAT-Core  
=> Revised to R2-1713937
- R2-1713937 TP on UE triggered transition from RRC\_INACTIVE to RRC\_CONNECTEDvivo discussion Rel-15 NR\_newRAT-Core  
=> Removed " cannot retrieve the UE Context "  
=> TP is agreed with changes above
- R2-1713141 TP on TS 37.340 Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
*moved from 10.2.1 to 10.2.19*  
=> First is change is not needed  
=> Other changes are agreed

## 10.2.20 Other (non EN-DC)

*Other stage 2 aspects for non EN-DC*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Dual registration*

- R2-1712385 Supporting Dual Registration in Access Stratum Lenovo, Motorola Mobility LS out Rel-15 NR\_newRAT-Core R2-1710156 To:SA2 Cc:RAN1, RAN4
- R2-1713878 RAN2 aspects to support dual registration Samsung Electronics GmbH discussion

R2-1712398	[DRAFT] Reply to LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR	Lenovo, Motorola Mobility	LS out	Rel-15	NR_newRAT-Core	R2-1711828
	To:SA2 Cc:RAN1, RAN4					
R2-1712688	Dual registration solution for 5GS / EPS interworking			Intel Corporation		discussion
	Rel-15 NR_newRAT-Core					
R2-1712995	Analysis on the feasibility and technical restrictions of dual registration			vivo		discussion
	Rel-15 NR_newRAT-Core		R2-1710927			
R2-1712996	Draft reply LS on dual registration	vivo	discussion	Rel-15	NR_newRAT-Core	
R2-1713348	Dual registration and RAN impacts		Ericsson	discussion	Rel-15	NR_newRAT-Core
	Core					
R2-1713884	[Draft] Reply LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR	Samsung Electronics GmbH	LS out	R2-1711776	To:SA2	
<i>Other</i>						
R2-1712170	Further considerations on radio network identities for NR			Samsung		discussion Rel-
	15 NR_newRAT-Core					
R2-1712323	BWP issues for non EN-DC			Huawei, HiSilicon		discussion Rel-15 NR_newRAT-Core
	Core					
R2-1712504	Regarding LS from RAN3 on Centralized Retransmission Solution			AT&T		discussion
R2-1712521	TP on 38.300 for RNA Configuration			Ericsson		discussion NR_newRAT-Core
R2-1712522	RAN Sharing and identifier aspects in NR			Ericsson		discussion NR_newRAT-Core
R2-1712523	VoLTE enhancements in NR			Ericsson		discussion NR_newRAT-Core
R2-1712524	Support for IMS Emergency calls in NR			Ericsson		discussion NR_newRAT-Core
R2-1712585	Discussion on the support of SCG SRB for intra-NR DC			Huawei, HiSilicon		discussion
	Rel-15 NR_newRAT-Core					
R2-1712943	Bearer handling in NR-E-UTRA Dual Connectivity			Samsung R&D Institute India		discussion
	Rel-15 R2-1711088					
R2-1713000	UE behavior upon SCell-failure of PDCP duplication			vivo		discussion Rel-15
	NR_newRAT-Core		R2-1710930			
R2-1713213	Support of Rel-14 voice enhancements in SA NR			Huawei, HiSilicon		discussion Rel-
	15 NR_newRAT-Core					
R2-1713350	CP latency in NR		Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713351	UP latency in NR		Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713401	Support of SRB3 for NR-NR DC		Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713692	AS context in RRC_IDLE		LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
	R2-1711383					
R2-1713696	Impacts of BWP for UE in IDLE and INACTIVE			LG Electronics Inc.		discussion Rel-
	15 NR_newRAT-Core		R2-1711387			
R2-1713721	Mobility history reporting in NR			LG Electronics Inc.		discussion Rel-15 NR_newRAT-Core
	Core R2-1710810					
R2-1713753	Support for IMS emergency services in NR			LG Electronics Inc.		discussion Rel-
	15 R2-1711156					
R2-1713772	RAN2 aspect on fast carrier switch			Samsung Electronics		discussion R2-1711803
R2-1713893	RAN2 consideration on control plane latency enhancement			Samsung Electronics GmbH		
	discussion R2-1711793					

## 10.3 Stage 3 user plane

*Documents in this agenda item will be handled in the NR user plane break out session*

### 10.3.1 MAC

#### 10.3.1.1 TS

*Latest TS 38.321, rapporteur inputs, etc*

*Including output from email discussion [99bis#12][NR UP/MAC] – Running TS 386.321 – Samsung*

*Please provide input to the rapporteur for corrections. Single rapporteur TP is encouraged.*

R2-1712698 Draft TS 38.321 v1.1.0 Samsung (Rapporteur) draft TS Rel-15 38.321 1.1.0 NR\_newRAT-Core

=> The TS is endorsed

R2-1713943	List of open issues on NR MAC available Late => Not treated	Samsung (Rapporteur) Rel-15 38.321 NR_newRAT-Core	discussion	Agreement	TS
R2-1712980	EN-DC impacts to LTE MAC - B NR_newRAT-Core => the CR is revised in R2-1714063	Huawei, HiSilicon	CR	Rel-15 36.321 14.4.0	1196
R2-1714063	EN-DC impacts to LTE MAC 1712980 => Remove the change from 6.1.3.10 => The CR is agreed in R2-1714072	Huawei, HiSilicon, Apple Rel-15 36.321 14.4.0 NR_newRAT-Core	CR	Approval	R2-1196
R2-1713944	Small issues on NR MAC => Noted	Samsung			

**Agreements:**

- 1: As in LTE, PDCCH order is used for network to trigger RA to UE
- 2: As in LTE, UE monitors PDCCH for RAR and Msg4 during random access procedure regardless the occurrence of a measurement gap.
- 3: The LTE principle is applied to NR on the maximum UL timing differences between TAGs
- 4: The LTE principle is applied to NR on the UL transmission while TAT is not running.

10.3.1.2 MAC general aspects

*Including output of email discussion [99bis#42][NR UP/MAC] – NR Unit replacement – Ericsson*

*Including output of email discussion [99bis#43][NR UP/MAC] Impact of BWP – LG*

*Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

*Contributions related to open issues discussed in email discussion will not be treated and are highly discouraged even if you disagree with the proposal made by rapporteur.*

R2-1713462	[99bis#42][NR UP/MAC] - NR Unit replacement NR_newRAT-Core => Noted	Ericsson	discussion	Rel-15
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R2-1713463	Text proposal for [99bis#42][NR UP/MAC] - NR Unit replacement Rel-15 NR_newRAT-Core - Xiaomi is concered with the use of the word “immediate” - Nokia suggests to use TTI - Convida suggests to use “transmission at this time” - Nokia thinks that we need to rediscuss the PDCCH occasion in the UL HARQ as it doesn’t cover SPS/GF => The principles in this TP are agreeable except the occurance of “immediate” => Discuss PDCCH occasion in UL HARQ with SPS => Discuss offline for appropriate replacement => The TP is revised in R2-1714191	Ericsson	discussion
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R2-1714191	Text proposal for [99bis#42][NR UP/MAC] - NR Unit replacement Rel-15 NR_newRAT-Core => for triggering an SR when there is already a grant, use as a baseline what is in the current TS “for immediate transmission” however companies can study until next meeting if there are additional changes needed. - Xiaomi doesn’t agree to the TP => Changes in 6.1.3.1 “Buffer Size: The Buffer Size field identifies the total amount of data available according to the data volume calculation procedure in TSs 38.322 and 38.323 [3] [4] across all logical channels of a logical channel group after <u>the MAC PDU has been built</u> => The TP is agreeable. The TP plus the change above in section 6.1.3.1 will be merged from rapporteur in main TS	Ericsson	discussion
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R2-1713879	Summary of e-mail discussion [99bis43] Impact of BWP NR_newRAT-Core Proposal 2	LG Electronics UK	discussion
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- Oppo thinks that we need to discuss
- Qualcomm indicates that RAN1 is now discussing the concept of 0 BWP.
- Intel asks what is the UE behaviour before the RRC configuration. It is better to use DCI as there is an ambiguity period. Huawei thinks that there may be a problem when the RRC reconfigures the SCell. Nokia thinks that a reasonable network would deactivate the SCell and then reconfigure. Vivo agrees.

Proposal 4

- Samsung thinks this depends on RAN1 agreement and whether it is confined within the BWP.

Proposal 6 During CFRA, the network doesn't perform BWP switching.

- CATT thinks that we may end up switching BWP due to timer and has a proposal that the timer is restarted when a PDCCH order is received. LG thinks that we can also say that the timer doesn't apply. Nokia asks what happens if the timer expires during the RACH procedure.
  - Vivo thinks that we should have a common solution for both CFRA and CB.
  - Nokia thinks that we now also have to consider the beam failure case.
- => Noted

*What UL BWP is used for CBRA*

1. Always Initial UL BWP
2. Active/Additional BWP

- Ericsson thinks that if we always use initial BWP then all UEs will use the same resources and we should have an option to configure dedicated resources.
- CATT asks if we mandate the UE to switch the DL BWP.
- Samsung thinks that the UE should also store the initial BWP

=> The option of always using UL initial BWP is excluded

*RACH configuration options*

1. Each BWP is configured with PRACH resources (The UE always performs RACH on the active BWP)
  2. Some UL BWP are configured with PRACH resources. (The UE performs RACH on the active BWP if configured with RACH resources). FFS what happens when there is not RACH configured with the active BWP
  3. Only one BWP are configured with PRACH (e.g. one common BWP)
- Intel thinks that the simplest option is 1 and we don't need to define UE behaviour in different cases. CATT agrees but option 2 can work as well.
  - Ericsson has a preference for option 2 as option 1 would mandate network NW to provide UL resources. Vivo agrees
  - LG prefers option 1.
  - ZTE asks how the NW knows where to transmit in the DL. LG thinks for the overlapping cases the NW can transmit in all DL.
  - Panasonic supports option 3.
  - Qualcomm supports option 2 and we can simply configure a simple common search space.
  - Nokia thinks option 1 is too much for the network.
  - InterDigital supports option 2. Mediatek thinks option 1 should be adopted and the NW should always commit RACH resources.
  - Ericsson has sympathy for Qualcomm's proposal on using a common search space
  - Huawei asks how the association is done with option 1 and option 2. Qualcomm doesn't think that we really need an association.
  - Intel asks what happens if the UE switches to initial UL/DL and the network doesn't know. CATT thinks that there may be some losses while the UE does RA. Qualcomm explains that is why the network should properly configure the search space. Lenovo and Ericsson accept the fact that there may be some losses, but it's ok. Vivo explains that the UE will send the C-RNTI in msg3 and the network will know where the UE is.



*What happens when a BWP switch command is received by the network while the UE is doing CBRA*

- Mediatek thinks that the simplest thing is to just stop the RA and then restart it in the new BWP. CATT thinks we should restart unless the BWP overlap.
- Convida thinks that we should stop and restart
- LG, Docomo thinks that continuing is the simplest one. For msg4 the network already knows the UE.
- Intel thinks that the UE will continue doing RACH and the network won't know where the UE is.
- Nokia thinks that the UE should continue the RACH procedure in the BWP it started with.
- LG thinks that if we let the UE continue with the existing procedure the UE will switch, select a new preamble and continue.
- Ericsson doesn't think ignoring is very problematic.
- Nokia indicates that in option 1 the UE may end up switching a BWP without a RACH config and has to switch again to the initial UL/DL and it sucks.

**Options**

1. The UE switches UL BWP, stops RA and restarts
2. The UE ignores the UL BWP switch commands and continues the RA procedures
3. UE implementations – UE is free to do whatever it wants (either option 1 or option 2)

Proposal 10

- CATT is concerned with the case that there is a numerology change.

*BWP timer – where to specify*

1. MAC
2. PHY

**Agreements:**

1. The UE behavior on the active BWP includes the followings:
  1. PDCCH monitoring on the BWP
  2. PUCCH transmission on the BWP, if configured.
  3. PUSCH transmission on the BWP
  4. PRACH transmission on the BWP, if configured.
  5. PDSCH reception on the BWP
2. For PCell/SCell, no additional activation step is required to activate a BWP when PCell is newly added (i.e. PCell/Scell is always configured with an active BWP)
3. There is no case that a cell is active with no active BWP.
4. BWP switching cannot occur during RA procedure for RRC Connection establishment
5. During CFRA the network doesn't perform BWP switching. FFS on the impact of beam recovery.
6. The UE stops the BWP timer when it initiates random access procedure
7. For contention based, some UL BWP are configured with PRACH resources. The UE performs RACH on the active BWP if configured with RACH resources. If not configured the UE uses initial UL/DL BWP. It is recommended for the network to configure RACH resources on active BWP. If the UE switches to initial BWP it stays there until told by the network to switch with a DCI.
8. When a BWP switch command is received while the UE is doing CBRA, it is up to UE implementation whether it switches BWP, stops the RA and start in new BWP or whether it ignores the BWP switch command and continues the RA in the BWP where it started.
9. There is no additional text required to specify the UE behaviour for the BWP switching during SR procedure. Only the PUCCH resources on the activated BWP can be considered valid.
10. BWP switching either by DCI or BWP timer does not impact any running *drx-InactivityTimer* or *drx-onDurationTimer*
11. No new PHR trigger condition is required for BWP switching
12. There is one HARQ entity per serving cell even with there are multiple BWPs configured for a serving cell.
13. The BWP timer is specified in the MAC

- R2-1714045 LS to RAN1 on BWP related agreements LG LS out  
=> The LS is approved in R2-1714049
- R2-1713880 TP for outcome of 99bis-43 Impact of BWP LG Electronics UK discussion  
NR\_newRAT-Core  
=> The TP is revised in R2-1714046
- R2-1714046 TP for outcome of 99bis-43 Impact of BWP discussion  
- Samsung ask if the UE doesn't get configured with a default does it use initial  
=> Update the TP to cover the case where the UE is not configured with Default BWP the UE uses Initial BWP  
=> TP is agreed with the update of fallback to initial BWP (to be covered in the running TS by Rapporteur)
- R2-1713806 BWPs for random access in connected mode Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core  
=> Not treated
- R2-1712433 Consideration on the UE autonomous BWP switch ZTE CORPORATION discussion Rel-15 NR\_newRAT-Core  
=> Not treated
- R2-1712870 MAC Functions to support Beam Management and Beam Recovery MediaTek Inc. discussion  
=> Not treated

**Not treated**

- R2-1713172 Revisit of Stage 3 MAC spec in consideration of SUL Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1713851 Common C-RNTI for common PDCCH CMCC discussion Rel-15 NR\_newRAT-Core R2-1713228
- R2-1712326 Remaining issues for BWP Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1713228 Common C-RNTI for common PDCCH CMCC discussion Rel-15 NR\_newRAT-Core
- R2-1713310 Unresolved NR-UNIT in Bj calculation MediaTek (Wuhan) Inc. discussion Rel-15 NR\_newRAT-Core

10.3.1.3 MAC PDU format

*Contributions should focus only on critical issues/corrections related to agreed MAC PDU formats – Max 1 contributions per company*

- R2-1712781 Remaining issues for MAC PDU format in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
Proposal 1: The UE only discards the first unknown MAC subPDU and subsequent MAC subPDUs; or, it is up to UE implementation how to deal with the unknown MAC subPDU.  
- Huawei thinks that with an interleaved structure the UE would have to wait to parse through all headers to check.  
- Intel agrees that this restricts UE implementation as some UEs will deliver packets to upper layers upon successful.  
=> Noted
- R2-1713534 MAC PDU discard at split bearer / SCG bearer reconfiguration Ericsson discussion Rel-15 NR\_newRAT-Core  
=> the CR is revised in R2-1714192
- R2-1714192 MAC PDU discard at split bearer / SCG bearer reconfiguration Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Noted

**Agreements:**

When a MAC entity receives a MAC PDU for the MAC entity's C-RNTI or SPS C-RNTI, or by the configured downlink assignment, containing a Reserved LCID value, or an LCID value the MAC Entity does not support, the MAC entity shall at least:

1> discard the received subPDU and any remaining subPDUs in the MAC PDU.

When a MAC entity receives a MAC PDU for the MAC entity's C-RNTI or SPS C-RNTI, or by the configured downlink assignment, containing an LCID value which is not configured, the MAC entity shall at least:

1> discard the received subPDU.

- R2-1713473 RAR Contents Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Noted
- R2-1712823 Unknown MAC PDU discard Fujitsu discussion Rel-15 NR\_newRAT-Core  
=> Not treated
- R2-1713535 Padding for NR Samsung discussion Rel-15 NR\_newRAT-Core R2-1711581  
=> This can be specified by just adding a line to state "padding size can be zero".  
=> Add that the L field should not to be present in the MAC sub-header
- R2-1712830 BI value and UE Contention Resolution Identity vivo discussion  
*Proposal 1: The Backoff Indicator subheader in LTE is reused and reserved Backoff Parameter values can be defined as 1200ms, 1600ms and 2000ms to meet various services (e.g. eMBB, URLLC) in NR.*
- Ericsson and Samsung think that the 0ms value is not useful. Nokia thinks that we have zero in LTE and NBIoT and we shouldn't remove it.
  - Qualcomm thinks the zero values is still important. Ericsson thinks that you can set it to zero by not including the BI.
  - Samsung thinks that we should still keep two reserved values.
- => Noted

**Agreements:**

1: In NR, the length of BI is 4 bit

2: As in LTE, the time unit of Backoff parameter value in NR is millisecond.

3: FFS - *The size of UL grant field in RAR message depends on further input from RAN1.*

4: For NR, length of TA field is 12 bits in MAC RAR. FFS if *there are reserved bits depending on the UL grant field size*

5: Temporary C-RNTI is 16 bits in RAR message. C-RNTI is 16 bits. [CB for Friday]

6: BI table design: remove the zero value from the NR BI table. 5 ms and 1920 ms are added in addition to LTE value

7: *If C-RNTI MAC CE was not included in Msg3, the contention resolution is successful if the UE Contention Resolution Identity received in Msg4 matches the first '48' bits of CCCH SDU transmitted in Msg3. FFS how contention resolution is done for the msg3 based SI request [CB for Friday to flag]*

- R2-1714071 summary of discussion on BI value vivo  
=> Noted
- R2-1712835 Handling of unknown, unforeseen and erroneous protocol data vivo discussion  
=> moved from 10.3.1.3

10.3.1.4 Random access

10.3.1.4.1 Differentiation of RA parameters

*This AI will not be treated. Discussion on this topic will resume where we left off after Dec. 2017*

Not treated

R2-1712381 Categorized Events for Differentiation of backoff and power ramping parameter Beijing  
Xiaomi Mobile Software discussion Rel-15 R2-1711040

R2-1712837 Differentiation of Backoff parameter and/or power ramping Samsung discussion  
NR\_newRAT-Core

- R2-1712911 Differentiation for SR-triggered Random Access Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1713472 Differentiation on RACH parameters in NREricsson discussion Rel-15 NR\_newRAT-Core
- R2-1713800 Details of prioritized random access AsusTek, CATT, Convida, Ericsson, Huawei, Intel, Interdigital, ITRI, OPPO, Qualcomm, Vivo discussion Rel-15 NR\_newRAT-Core R2-1711695

#### 10.3.1.4.2 Random access in presence of multi-beam operation

*Max 1 contribution per company only on issues related to multi-beam operation*

- R2-1712904 Remaining issues on the power ramping Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- Proposal 1: Preamble selection procedure between Group A and B in contention-based random access should be applied for the set of preamble associated with each SS block.
- Proposal 2: For the selection of preamble between group A and B for contention-based RA, the test condition that whether or not msg3 is being retransmitted should be deleted.
- Ericsson thinks that if we change SSB we should re-evaluate the condition but otherwise we don't need.
  - Samsung thinks that even in LTE during retransmission the PL can change but we don't re-select. Nokia agrees. Interdigital agrees and there is no need to delete text.
- Proposal 3a: For CFRA, when the network sends a PDCCH order to the UE with the dedicated PRACH resources and the common PRACH resources, the UE chooses the PRACH resource first in the dedicated PRACH resources and then in the common PRACH resources.*
- Samsung indicates that RAN1 is still discussing whether PRACH resources will be provided in case of CFRA
- Proposal 4: Remove the above Editor's note and incorporate in RAN 1's agreement: the threshold is configured by the network. Take the following NOTE in the section 5.1.2 of MAC specification. NOTE: It is up to UE implementation how to select the SS block when multiple SS blocks are above the ssb-Threshold.
- Interdigital thinks that it was agreed in common session and there is no need to capture anything
  - Intel and Huawei think that we should capture in the note the two RAN1 cases.
- => Noted

#### **Agreements:**

1. Preamble selection procedure between Group A and B in contention-based random access should be applied for the set of preamble associated with each SS block
2. The UE doesn't reselect between group A or B even if PL changes (i.e. we keep the existing text)
3. Move the location of "increment PREAMBLE\_POWER\_RAMPING\_COUNTER" to section 5.1.3 of MAC specification

- R2-1712434 Further consideration on the power ramping ZTE CORPORATION discussion Rel-15 NR\_newRAT-Core
- LG thinks that the ping-pong issue can be fixed by proper setting of the threshold.
  - Intel asks if it is possible to fix this issue by filtering
- => Noted
- R2-1712782 Location of the Power Ramping Counter in the RA Procedure InterDigital discussion Rel-15 NR\_newRAT-Core
- => not treated
- R2-1712379 Multiple preamble transmission for contention free RACH Beijing Xiaomi Mobile Software discussion Rel-15 R2-1711050
- => not treated
- R2-1713362 Beamformed Random Access: Remaining Issues Samsung R&D Institute India discussion
- => not treated

R2-1713380 Beam recovery using RA procedure Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT

*Proposal 1: Beam failure recovery request using a dedicated PRACH preamble is initiated and performed by MAC through Random Access procedure.*

- Mediatek supports to do it in the MAC but we can discuss in which section
- Convida asks why each beam failure has to be told to the MAC. Nokia thinks that the MAC needs to be aware of the failure.
- Intel asks if the beam failure procedure will be specified
- LG thinks that there are two ways to handle this – one is the PHY tells the RRC and then the RRC notifies the MAC or the PHY tells the MAC directly.
- Intel thinks that RAN1 is still discussing this and if it is the same as in-synch and out-synch we can follow a similar approach as LTE.
- Lenovo doesn't see the benefit of notifying the RRC as the beam failure/recovery is done at the PHY. Mediatek agrees and thinks that the PHY should indicate and the MAC can specify the procedure.
- Panasonic thinks that we also need to select the best beam. Where is this selection done? Samsungs says it's the MAC.
- Sharp says that the PHY also has to select the candidate beam in L1

*Whether we support fallback to contention based*

- Convida thinks that beam recovery doesn't happen very frequently and when it happens do we really need to optimize. We can rely on RLF. Nokia thinks that we should avoid RLFs as much as possible.
- Mediatek doesn't think this is necessary as the recovery procedure should be a fast recovery procedure and if we do CB then it is no longer a fast recovery. Docomo agrees
- Panasonic thinks it is important to support CB as there are cases in which the best beam is not associated to a dedicated preambles. Nokia thinks that it would mandate the network to allocate a dedicate preamble per SSB.
- Samsung supports CB, otherwise it would take a lot longer to do cell reseletin and re-establishment.
- Lenovo and LG support fallback. LG explains that even for handover case the UE has the option to perform handover use CB if it fails.
- Intel asks if

**Agreements**

1. Beam failure recovery using a dedicated PRACH preamble is specified in the MAC and triggered upon indication from Physical layer. RAN2 assumes that the PHY layer does the detection of beam failure.
2. Beam selection is specified in the MAC similar to the HO case
3. The UE uses contention free when there is a beam associated to a dedicated "preamble/resource" and the beam is above a threshold. Otherwise use contention based.

=> LS to RAN1 informing them of our agreements

R2-1714048 LS to RAN1 on beam recovery failure Nokia LS out  
=> The LS is approved in R2-1714050

R2-1714047 TP on beam recovery Nokia  
=> Review the two TPs from R2-1713380 and R2-1712870 to determine what is the best way to capture  
=> Assumption is that it will be a separate section  
=> The TP is agreed

R2-1712870 MAC Functions to support Beam Management and Beam Recovery MediaTek Inc.  
discussion  
=> Moved from 10.3.1.1  
=> Noted

- R2-1713479 Parameters for Random Access preamble groups when SSBs are configured Ericsson  
 discussion Rel-15 NR\_newRAT-Core  
 Proposal 4 The preambles in Random Access Preamble Group B are the preambles whose indices are from startIndex-PreambleGroupA + sizeOfRA-PreamblesGroupA to startIndex-PreambleGroupA + numberOfRA-Preambles – 1.  
 - Qualcomm and Samsung don't see why these parameters have to be configured on a per SSB  
 - Samsung thinks that groupB should be supported per cell and not per SSB. So if it is supported in a cell it should be configured per SSB.  
 => Noted

**Agreements for the case where SSBs are mapped to preambles in the non-overlapping case:**

- 1 The parameters sizeOfRA-PreamblesGroupA and numberOfRA-Preambles are defined for each SSB. The parameter messageSizeGroupA is defined per cell.
- 2 A new parameter startIndex-PreambleGroupA is defined for each SSB. 3 The preambles in Random Access Preamble Group A are the preambles whose indices are from startIndex-PreambleGroupA to startIndex-PreambleGroupA + sizeOfRA-PreamblesGroupA – 1.
- 4 The preambles in Random Access Preamble Group B (if supported by the cell) are the preambles whose indices are from startIndex-PreambleGroupA + sizeOfRA-PreamblesGroupA to startIndex-PreambleGroupA + numberOfRA-Preambles – 1. If group B is supported by the cell random access preambles group B is included in each SSB.

- R2-1713808 Backoff indication in mmW systems Qualcomm Incorporated discussion Rel-15  
 NR\_newRAT-Core  
 => Not treated
- R2-1712653 On choosing SSB for RACH resource selection Intel Corporation discussion Rel-15  
 NR\_newRAT-Core  
 => Not treated

#### 10.3.1.4.3 Random access procedures

*Final issues to be resolved on further details of random access procedures, preamble selection, power ramping for msg1 transmission (with no beam forming) RA-RNTI calculation and contention resolution. – Maximum 1 contribution per company*  
*Stage 3 details of On-demand SI request. Details for msg3 based-SI request depend on CP discussions will not be progressed given the prioritization of SI design in CP.*

- R2-1712203 The first x bits of CCCH SDU transmitted in Msg3 OPPO discussion Rel-15  
 => Noted
- R2-1712652 Random Access Procedural Aspects Intel Corporation discussion Rel-15  
 NR\_newRAT-Core  
 => *Noted*
- R2-1713076 RA-RNTI formula MediaTek Inc. discussion  
 => *Noted*
- R2-1713809 On RA-RNTI calculation Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core  
 => Noted

#### *Whether to use subframe or symbol level*

- LG thinks that we should simplify and use subframe as different numerologies have different symbol lengths. Intel explains that we need to go to symbol level to be able to uniquely identify each symbol. LG explains that in LTE we use contention to resolve the collision.
- Samsung thinks that we should have symbol level granularity.
- Ericsson thinks that we can achieve this using Qualcomm's proposal, with an index per PRACH occasion. Samsungs explains that this depends on the number of PRACH occasions. ZTE thinks that we should deal with the worst case scenario. ZTE's proposal is PRACH occasion index within slot
- Oppo asks how big the RA-RNTI would be. Intel says 840 for worst case scenario.

*If SUL carrier is configured for RACH transmission, the UL carrier used for Msg1 transmission can be incorporated in RA-RNTI computation.*

- CATT doesn't see the need to increase complexity and the network can avoid collisions. ZTE thinks it would be complex for the network. ZTE thinks we can differentiate with the RAR rather RA-RNTI. Huawei thinks RA-RNTI is a more straight forward way.
- Oppo shares the same view as CATT. InterDigital sees a need to include an index and it can be either done by including index in the formula or extending the fid. QC thinks we should include in Rel-15.
- ZTE is concerned that this will increase the RA-RNTI space and the decoding in the UE.
- Ericsson thinks that the network can just configure different RACH configuration for each carrier. Qualcomm thinks it can be challenging as they have to be non-overlapping
- Oppo thinks that we can also differentiate by using different preamble index.
- Fujitsu think we can separate by fid.

RAR window size

- Samsung thinks that it should be up to 10ms. Intel asks if the window should be defined in terms of slots. ZTE thinks the periodicity of the CORESET can be more than 10ms and then it can be problematic to limit to 10ms.

**Agreements:**

- 1 RA-RNTI calculation does not need to include SS block index.
- 2 Regarding multiple PRACH instances within a slot, the RA-RNTI equation in LTE should be modified for NR to provide OFDM symbol level granularity.
- 3 For SUL, some form of differentiation will be specified. FFS how.
- 4 RAR window size is up to 10ms

R2-1714069 summary of discussion on RA-RNTI Intel Corporation discussion

**Agreements**

- => Capture OFDM symbol ID explicitly.
- => Option 1 as a baseline: By including explicitly in the RA-RNTI computation (as a multiplicative factor).
- => Use formula suggested by Intel R2-1714069. Range of parameters are FFS

=> Noted

Not treated

R2-1712856	Further considerations on the RA procedure	CATT	discussion	
R2-1712443	Remaining details of RACH procedure	ZTE CORPORATION	discussion	Rel-15
	NR_newRAT-Core			
R2-1713474	Open issues for the Random access procedure	Ericsson	discussion	Rel-15
	NR_newRAT-Core			
R2-1713366	Msg1 based SI Request: DL TX Beam Identification	Samsung R&D Institute India		
	discussion	Rel-15 NR_newRAT-Core		
R2-1713367	Msg1 based SI Request: PRACH Preamble Selection	Samsung R&D Institute India		
	discussion			
R2-1712785	RACH Configuration in Handover	InterDigital	discussion	Rel-15 NR_newRAT-Core
	R2-1710657			
R2-1712815	RA-RNTI calculation	Fujitsu	discussion	Rel-15 NR_newRAT-Core
R2-1712903	Remaining issues on RA procedure	Huawei, HiSilicon	discussion	Rel-15
	NR_newRAT-Core			
R2-1712906	Complete text proposal for NR random access procedure	Huawei, HiSilicon		discussion
	Rel-15 NR_newRAT-Core			
R2-1712910	Discussion on the procedure of MSG1-based SI request	Huawei, HiSilicon		discussion
	Rel-15 NR_newRAT-Core			
R2-1712977	RA-RNTI calculation	Fujitsu	discussion	Rel-15 NR_newRAT-Core R2-1710357
R2-1713229	RA-RNTI calculation in NR	CMCC	discussion	Rel-15 NR_newRAT-Core
R2-1713371	Random Access in NR: RA-RNTI Calculation	Samsung R&D Institute India	discussion	

- R2-1713381 Clarification on the Preamble group B selection discussion Rel-15 NR\_newRAT Nokia, Nokia Shanghai Bell, NTT DOCOMO
- R2-1713633 Considerations for RA-RNTI calculation LG Electronics Inc. discussion NR\_newRAT-Core R2-1711609

#### 10.3.1.4.4 Other aspects related to RA

*Other remaining aspects including impacts of SUL on initial access*

Not treated

- R2-1713477 Criteria for selection of Preamble group B Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1712432 Consideration on the remaining issues for multi-Msg.1 transmission discussion Rel-15 NR\_newRAT-Core ZTE CORPORATION
- R2-1713368 Multiple Msg1 Transmissions Samsung R&D Institute India discussion Rel-15
- R2-1713372 Random Access in RRC Connected: Bandwidth Part Aspects discussion Samsung R&D Institute India
- R2-1713475 Preamble transmission power Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1713478 Backoff Parameter values for Random Access NR\_newRAT-Core Ericsson discussion Rel-15
- R2-1713529 DRAFT LS on Preamble transmission power Ericsson LS out Rel-15 NR\_newRAT-Core To:RAN1

SUL

- R2-1712905 Discussion on RA procedure related to SUL Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
*Proposal 1: MAC layer should select the SUL carrier when the RSRP measured on the downlink is lower than RSRP threshold.*  
 - ZTE thinks it needs to be done in the MAC. Interdigital thinks that the selection can be done in RRC as it is aware of RSRP measurements.  
*Proposal 2: when indicate by the PDCCH order or RRC signalling, the MAC entity should perform the rest of the RA procedure on the indicated UL carrier.*  
 => Noted
- R2-1712762 Random access with SUL and corresponding Text Proposal vivo discussion Rel-15 NR\_newRAT-Core  
 => Noted
- R2-1712280 Discussion on UP issues for SUL ZTE Corporation,Sanechips discussion NR\_newRAT-Core  
 Proposal11: for cell with SUL, SPS/GF configuration in the uplink should be configured (activated) only on one uplink carrier.  
 - Vivo thinks we shouldn't support SPS/GF with SUL  
 - Huawei thinks the network can configure on both carriers  
 - Nokia thinks we should use the same agreement as BWP (one active at a time per cell).  
 => Noted

#### Agreements

1. For CB RA, when needed (as per CP agreement) MAC layer selects the SUL carrier according to the RSRP threshold criteria
2. The UE shall not perform SUL switch while having an ongoing RA procedure
3. As a baseline the same restrictions on number of UL SPS/GF configurations apply for SUL.

Not treated

- R2-1713476 Random Access and SUL Ericsson discussion Rel-15 NR\_newRAT-Core
- R2-1712783 RA Procedure on the SUL InterDigital discussion Rel-15 NR\_newRAT-Core
- R2-1712279 Discussion on RACH procedure for SUL ZTE Corporation,Sanechips discussion NR\_newRAT-Core
- R2-1712373 SUL impact on random access Beijing Xiaomi Mobile Software discussion Rel-15



10.3.1.5 SR

*Including output of email discussion [99bis#38][NR UP/MAC] – SR open issues - Nokia*

*Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

*Contributions related to open issues discussed in email discussion will not be treated and are highly discouraged even if you disagree with the proposal made by rapporteur.*

R2-1712973 Email discussion summary on [99bis#38][NR UP/MAC] – SR open issues - Nokia Nokia discussion Rel-15 NR\_newRAT

**Proposal 6:** discuss which option to adopt if there are SR configurations but the mapping is not configured for a LCH assigned to a LCG.

Option 1: trigger RACH (11)

Option 3: remain pending until cancelled **if there are other pending SR** (10)

Option x: Trigger RACH if there is no other pending SR with a valid SR configuration otherwise SR remains pending until cancelled. If an SR with SR configuration is triggered while RACH is ongoing, the UE can send the SR.

- Ericsson asks what happens with option 3. CATT explains that nothing happens, the UE just keeps the SR.
- CATT asks what happens if we have two SRs and one triggers the RACH. Nokia thinks that option 1 may be more complicated because of the scenario from CATT.
- Lenovo understands that if the network doesn't configure then it is for non latency critical services and RACH is a natural consequence.
- LG thinks we shouldn't have parallel RACH and SR and option 1 is not good if there is any pending SR. Lenovo doesn't see what is complex.
- Interdigital asks what happens if a SR is triggered while a RACH is ongoing. Ericsson thinks that the network should properly configure.

discuss which option to adopt for SR triggered by retxBSR-Timer expiry.

Option 1: SR configuration of the highest priority LCH that has data available for transmission (12);

Option 2: SR configurations of all the LCHs that have data available for transmission (8).

- Interdigital thinks that we may have LCP restriction so it is important to know the highest priority logical channel. Ericsson and Samsung see benefit with option 1. HTC supports option 1.

**Proposal 14** As in LTE, all pending SR(s) shall be cancelled and sr-ProhibitTimer shall be stopped when a MAC PDU is assembled and this PDU includes a BSR which contains buffer status up to (and including) the last event that triggered a BSR, or when the UL grant(s) can accommodate all pending data available for transmission. (already captured in the running TS.)

- Huawei is concerned with the case that a BSR is sent over eMBB grant for URLLC. The SR for URLLC should be triggered and be sent otherwise the service latency won't be met. Samsung asks why is the network giving an eMBB grant instead of URLLC. Huawei thinks that the network may have already given the grant before receiving the SR of URLLC.
- Qualcomm thinks Huawei's concern is quite valid and it is best to leave it to UE implementation to decide whether it should cancel it or trigger it. ZTE asks if this means that PUCCH and PUSCH would be transmitted at the same time. CATT thinks that in Rel-15 we can't do simultaneous PUCCH/PUSCH. Ericsson thinks that we can handle this cases with pre-scheduling as well.
- Interdigital thinks that there is a concern with latency. Huawei thinks that a loss of a packet is a big issue for ultra reliable services. Lenovo thinks that if this is very important it can use grant-free.

**Agreements:**

1. Single SR configuration with single SR ID covers PUCCH configurations for one or more BWPs and PUCCH SCell
2. maximum of 8 SR configurations should be supported per MAC entity

3. SR configuration ID is configured in LCH configuration for the mapping between SR configuration and LCH.
4. If there are SR configurations but a mapping is not configured for a LCH assigned to a LCG a RACH is triggered.
5. Use absolute time as unit for *sr-ProhibitTimer*
6. *logicalChannelSR-ProhibitTimer* is per MAC entity and *logicalChannelSR-Prohibit* is set per LCH as in LTE, no other special handling for the timer is introduced.
7. rename *logicalChannelSR-ProhibitTimer* to *logicalChannelSR-DelayTimer* to distinguish from *sr-ProhibitTimer*
8. there can be multiple pending SRs per MAC entity.
9. for each pending SR, the SR configuration of the LCH that triggers the BSR is used for SR transmission.
10. For SR triggered by *retxBSR-Timer* expiry, the UE uses the SR configuration of the highest priority LCH that has data available for transmission
11. As in LTE, all pending SR(s) shall be cancelled and *sr-ProhibitTimer* shall be stopped when a MAC PDU is assembled and this PDU includes a BSR which contains buffer status up to (and including) the last event that triggered a BSR, or when the UL grant(s) can accommodate all pending data available for transmission. (already captured in the running TS.)
12. SR is sent when there is no overlapping PUSCH and PUCCH collision for the case of retransmission
13. As in LTE, SR is sent only if it does not collide with measurement gap
14. the SR configuration on PUCCH SCell is kept when the SCell is deactivated as in LTE
15. the SR configuration on a BWP is kept when the BWP is deactivated/switched.

R2-1712974 TP outcome of Email discussion [99bis#38][NR UP/MAC] – SR open issues - NokiaNokia discussion Rel-15 NR\_newRAT  
=> The TP is revised in R2-1714052

R2-1714052 TP outcome of Email discussion [99bis#38][NR UP/MAC] – SR open issues - Nokiadiscussion Discussion R2-1712974 Rel-15 NR\_newRAT  
- Panasonic thinks that you should cancel them them all. Interdigital thinks we should cancel other pending SR as they may belong to other high priority channel.  
=> confirm the agreement on triggering RACH when there is no SR configured for the LCHc cancel only the concerned SR that does not have SR configuration mapping.  
=> The TP is agreed

R2-1712436 Consideration on SR Transmission in NR ZTE CORPORATION discussion Rel-15 NR\_newRAT-Core  
=> Noted

Not treated

R2-1713480 Open issues for scheduling request Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1712267 SR configuration reuse under LCH release Spreadtrum Communications discussion Rel-15

R2-1712284 Outstanding issues with SR design for NR and TP for TS 38.321 Samsung R&D Institute UK discussion

R2-1712784 Remaining Details of the SR Procedure InterDigital discussion Rel-15 NR\_newRAT-Core  
=> Withdrawn

R2-1712816 SR procedure with multiple SR configurations Fujitsu discussion Rel-15 NR\_newRAT-Core  
Withdrawn

R2-1713938 Additional Issues of the SR Procedure Xiaomi Late

### 10.3.1.6 BSR

Including output of email discussion [99bis#39][NR UP/MAC] – BSR open issues – Vivo

Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution

Contributions related to open issues discussed in email discussion will not be treated and are highly discouraged even if you disagree with the proposal made by rapporteur.

R2-1712827 [99bis#39][NR UP/MAC] – BSR open issues vivo discussion  
=> Noted

*LTE BSR cancellation part in TS 36.321 is reused for NR BSR cancellation.*

- Qualcomm is concerned about the case of multiple parallel grants. Lenovo, Vivo agrees.
- Ericsson asks if we relax the requirement we may add overhead. Qualcomm thinks that if have large grant the overhead is small and this shouldn't happen

*For NR, the MAC entity can include a padding BSR in any of the MAC PDUs, which do not contain a Regular/Periodic BSR*

- Intel thinks we should not mandate the UE to include a padding BSR

*For NR, all BSRs transmitted in a TTI always reflect the buffer status after all MAC PDUs have been built for this TTI. However there is no more description in NR BSR procedure part in addition to the description in Buffer Size description part*

*For NR, shall each LCG report at the most one buffer status value per TTI in case of multiple BSR MAC CEs in one TTI*

- CATT thinks that BS reflects the buffer status at the end of the assignment.
- Huawei thinks that if the BS reflects the buffer status at the end we can have different BS values in two MAC PDU. HTC agrees.
- LG thinks it is good to remove the restrictions. Ericsson is concerned that the gNB doesn't know how to estimate which BS to take into account. Qualcomm agrees with LG and thinks that the gNB can figure it out from the start time of the transmission.

*Formula*

$$B_k = \lceil B_{min} \cdot (1 + p)^k \rceil \text{ where } p = (B_{max} / B_{min})^{1/(N-1)} - 1. \text{ (Formula A)}$$

$$B_{max} = \text{Maximum Transport Block Size} \times 2 \times \text{RTT} \times N_{mimo} \times N_{carrier} \text{ (Formula B)}$$

- Huawei asks if companies have considered 1 RTT.

Proposal 12: Online discussion is needed for below three issues:

*Open issue 11: Shall the MAC subheader of the variable-size BSR MAC CE be optimized without an L field?*

- Nokia thinks we need to distinguish between the truncated BSR and long BSR. For long BSR we need L field and truncated BSR may not be need as the size can be determined. Ericsson agrees. Oppo thinks that for long BSR we can omit the L field as the bitmap can indicate the length. LG wants to keep the same format and we can omit the L field for both cases. CATT thinks we can remove L field for both cases.
- Mediatek thinks its important that we have the same formats. Qualcomm thinks that the L field is important to include for truncated.
- CATT thinks that if we add the L field we are adding two more bytes.
- Ericsson and Nokia want to have quick processing of the header fields and therefore to have the L field for long BSR.
- HTC thinks we should keep the L field and bitmap indicate the LCG being reported
- LG doesn't see why it is more complex.

*Option 1- L field for Long BS and no L field for truncated BSR*

*Option 2 - No L field for both*

*Option 3 – L field for both*

*Option A or Option B*

After offline

1. L field for both and bitmap indicate LCG reported (9)
2. L field for both and bitmap indicates what data is available (11)

**Agreement**

- => L field for both. Bitmap indicates which LCG has data is available for truncated BSR and for long BSR the bitmap includes all LCG being reported.
- => The BS order is in order of LCG index for both cases

R2-1714190 TP on long/truncated BSR on Ericsson

=> The TP is agreed

- CATT still has the same concern.
- Nokia thinks that it can be acceptable if we handle the 3 byte padding case.

*Open issue 12: For truncated BSR, shall the bitmap indicate which LCG have buffered data (A) or which LCG are being reported (B).*

- Nokia thinks that to make the truncated BSR useful we should report the LCG that have buffered data
- Vivo supports option B. LG as well. What is important is the value of high priority data buffered in the UE. Oppo would like to align the formats. Ericsson supports option A as it provides similar information to long BSR. Qualcomm agrees with Ericsson and Nokia, it provides useful info. CATT as well.
- Samsung supports option B. LG thinks that there is complexity with option A as the network has to figure out which LCG the UE is reporting.
- HTC thinks that option B is simpler.

*Open issue 13: How are LCG to be reported selected when of equal priority.*

**Agreements**

1. The short BSR is used for padding BSR in case of no any data in all LCGs
2. The long BSR format is used when only a single LCG has data available in case that the number of padding bits is equal to or larger than the size of the long BSR plus its subheader
3. The truncated BSR will not start or restart the periodicBSR-Timer
4. LTE BSR cancellation part is re-used for NR BSR cancellation TS 36.321 with the change from "shall" to "may"
5. No restriction is needed to be specified that the MAC entity shall transmit at most one Regular/Periodic BSR
6. For NR, the MAC entity shall not include a padding BSR in any of the MAC PDUs which contain a Regular/Periodic BSR
7. One MAC PDU contains at most one BSR. No restriction on the UE reporting the same BS value in case of multiple overlapping MAC PDUs is specified.
8. Confirm that no new BSR trigger is needed for NR
9. *[Assumption waiting for RAN1 input]* The above formula A and formula B are used as baseline for 8 bits BS calculation; the detailed parameters can be revised after receiving RAN1 LS, e.g "2xRTT", Nmimo and Ncarrier. FFS if we there is a need to have more than one table
10. The max value of RTT is used if RAN1 provides a range for RTT value in their LS
11. The Bmin value is equal to 10 bytes for both 5 bits BS table and 8 bits BS table. The different Bmax values are applied for 5 bits BS table and 8 bits BS table. The final Bmax values for 5 bits BS table and 8 bits BS table can be discussed after receiving RAN1 LS.

R2-1712828 TP for output of email discussion #39 BSR open issues vivo discussion

=> The TP is revised in R2-1714056

R2-1714056 TP for output of email discussion #39 BSR open issues discussion R2-1712828

=> Change last sentence in 5.4.5: "The MAC entity shall transmit at most one BSR in one MAC PDU. Padding BSR shall not be included when the MAC PDU contain a Regular or Periodic BSR"

=> The two paragraphs of section 5.4.5 will be merged in the main TS and include the change above by rapporteur.

Not treated

R2-1712472 BSR design to support pre-processing MediaTek Inc. discussion Rel-15 NR\_newRAT-Core R2-1710695

R2-1713354	Padding BSR for multiple UL grants discussion Rel-15	Intel Corporation, Qualcomm Incorporated		
R2-1713805	On BSR cancellation conditions NR_newRAT-Core R2-1711708	Qualcomm, Intel, MediaTek	discussion	Rel-15
R2-1712316	Uses of different BSR formats Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712814	MAC TP for BSR Fujitsu discussion	Rel-15 NR_newRAT-Core		Withdrawn
R2-1712824	Necessity of R values in Long BSR	Fujitsu discussion	Rel-15 NR_newRAT-Core	
R2-1713230	More considerations on BSR CMCC discussion	Rel-15 NR_newRAT-Core		
R2-1713483	Open issues on BSR Ericsson discussion	Rel-15 NR_newRAT-Core		
R2-1713687	Discussion on a potential issue for BSR HTC discussion	Rel-15 NR_newRAT-Core		

### 10.3.1.7 LCP

*Including output of email discussion [99bis#40][NR UP/ MAC] – LCP – Interdigital*

*Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

*Contributions related to open issues discussed in email discussion will not be treated and are highly discouraged even if you disagree with the proposal made by rapporteur.*

R2-1712786	Summary of email discussion [99b#40][NR UP/MAC] LCP InterDigital NR_newRAT-Core	discussion	Rel-15
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*Decide at RAN2#100 if LCH selection includes a restriction on minimum PUSCH duration.*

*Options 1: T<sub>min</sub>, T<sub>max</sub> (allow T<sub>min</sub> may be zero)*

*Option 2: T<sub>max</sub>*

- Samsung would like to know the motivation the about T<sub>min</sub>. Mediatek also thinks we should keep it simple and there other ways to prevent eMBB from using URLLC.
- Nokia thinks that the most important is to not use grant free resources by eMBB and T<sub>min</sub> is a simple way of achieving it.
- Mediatek thinks that using T<sub>min</sub> to prevent eMBB from using GF is not a good way to do it and putting a direct restriction is better.
- Nokia thinks that for the collision base it is very important that eMBB doesn't use GF resources as it will cause a lot of collision. LG, QC agrees and thinks that T<sub>min</sub> can be used. Interdigital explains that we cannot use numerology to prevent this case as we are only allowed on BWP active a time. Convida thinks that we should restrict but if use T<sub>min</sub> we would also restrict dynamic grant.
- Qualcomm thinks that by setting T<sub>min</sub> to zero the network can control whether a restriction is applied for dynamic grants.
- CATT thinks that the two options are independent and should both be sepcied.

=> Means to restrict eMBB from using grant free

Option 1: scheduling type direct restriction (e.g. grant free or dynamic)

Option 2: T<sub>min</sub> with value zero allowed

*In case of slot aggregation, the duration of a single repetition of a TB (i.e. single PUSCH transmission) should be considered for LCH selection*

- CATT thinks that the total time including repetition should be taken into account as it impacts the overall latency. Interdigital thinks that a repetition can be schedule for additional reliability but the network can decode the packets earlier.

#### BSR

- Mediatek thinks we shouldnot send padding BSR especially for the case of grant free. We shouldn't use the grant free to transmit BSR for eMBB. Samsung thinks we can keep it simple and just skip if there is no data that can be transmitted with that grant.

#### Options

1. UE skips
2. UE sends periodic BSR
3. UE sends BSR only for dynamic grant. FFS for grant-free

On Bj

- Qualcomm thinks that it is better to be event driven
- Samsung thinks that it should be done at a regular rate.
- Convida thinks that the important part is that it is accurately update at the time of LCP.

<b>Agreements:</b>	
1. Subcarrier spacing and PUSCH duration restrictions are applied independently. Only Tmax PUSCH duration is used	
2. Means to restrict eMBB from using certain grants (e.g. grant free) will be specified. A scheduling type restriction is defined (e.g. a restriction per type of grant)	
3. No additional restriction based on the granularity of PUSCH transmission duration is introduced	
4. In case of slot aggregation, the duration of a single repetition of a TB (i.e. single PUSCH transmission) should be considered for LCH selection	
5. The minimum grant size for not transmitting padding or padding BSR while having data available for transmission is 8 bytes	
6. The UE shall not perform UL skipping if a periodic BSR is triggered and there are data in any LCG	
FFS if there is no data available allowed to be transmitted on given UL grant the UE can perform UL skipping or if it can send padding BSR	
7. A priority order is specified between different types of MAC CE and logical channels and the order is the same as in LTE	
8. No change to the draft specification to address the "skipping segmentation" behavior. Revisit after December in case there are concerns	
9. No mechanism is introduced to minimize the reordering workload at the PDCP receiver	
10. No mapping rule is specified for MAC CE in case of multiple grants	
11. No additional prioritization mechanism based on time is specified before December	
12. No change to existing text to clarify that only logical channels with data are allocated resources in step 1	
13. No enhancements to LCP procedure to allow eMBB data to be allocated resources only in Step 3 for short PUSCH duration	
14. The increase of the variable Bj is independent of whether LCHj can utilize the grant or not	
15. The Bj should be up to date at the time the grant is processed by LCP. The rate and how it is updated it is up to UE implementation. T needs to be specified.	
16. Upon reception of an UL grant, PHY provides "uplink transmission information" to the MAC same as HARQ information. Uplink transmission information consists of Subcarrier Spacing index, PUSCH transmission duration, type of grant and cell information for the corresponding scheduled uplink transmission. The Uplink transmission information associated with an UL grant is used within LCP/logical channel selection procedure.	

R2-1712787	TP output of email discussion [99b#40][NR UP/MAC] LCP InterDigital	discussion	Rel-15
	NR_newRAT-Core		
	=> The TP is revised in R2-1714057		
R2-1714057	TP output of email discussion [99b#40][NR UP/MAC] LCP discussion	Approval	R2-1712787
	Rel-15 NR_newRAT-Core		
	<i>What is type of grant for restrict</i>		
	- LCP restriction for configured grant (type 1 and type 2)		
	- LCP restriction for configured grant type 1		
	=> LCP restriction is performed for configured grant type 1		
	=> Baseline for now: If there is no data available allowed to be transmitted on given UL grant the UE can perform UL skipping (do not send padding BSR). FFS for next meeting if we do allow padding BSR in some cases.		
	=> The TP is agreed		
R2-1712912	LCP procedure for NR Motorola Mobility España SA	discussion	Rel-15 NR_newRAT-Core
	Core		
	=> Not treated		
R2-1712215	Discussion on the relative priority order of NR LCP ASUSTeK	discussion	Rel-15
	NR_newRAT-Core		
	=> Not treated		

- R2-1712365 LCP design for NR – focus on calculation and updating of Bj values in NR – and TP for TS 38.321  
 Samsung R&D Institute UK discussion  
 => Not treated
- R2-1712374 SUL impact on LCP Beijing Xiaomi Mobile Software discussion Rel-15  
 => No restriction necessary for SUL  
 => Noted
- R2-1712900 Text Proposal on LCP in NR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-  
 Core Withdrawn  
 => Not treated
- R2-1713467 Open issues on LCP Ericsson discussion Rel-15 NR\_newRAT-Core  
 => Not treated

### 10.3.1.8 SPS/Grant-free

*Including output of email discussion [99bis#41][NR UP/MAC] – Open issues on SPS and GF – Huawei  
 Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP  
 included in the contribution  
 Contributions related to open issues discussed in email discussion will not be treated and are highly discouraged even if you  
 disagree with the proposal made by rapporteur.*

- R2-1713173 Summary of [99bis#41][NR/UP] Open issues on SPS and GF Huawei, HiSilicon  
 discussion Rel-15 NR\_newRAT-Core
- Proposal 1: RAN2 confirms that no addition issues need to be addressed regarding  
 activation/deactivation for Type 2 (SPS) and an RNTI can be used at least for one resource  
 configuration in a serving cell for Type 2 (SPS).
- LG asks how retransmissions work for type 1
- Retransmissions of GF Type 1 and Type 2 (SPS) can continue with dynamic grant as long as  
 RRC configured RNTI(s) of GF Type 1 and Type 2 (SPS) is valid.*
- Nokia and LG think that we can use dynamic grant and don't need to capture anything.
  - LG asks how to distinguish between UEs in the case of shared resource.
  - CATT thinks that we should keep the RNTI alive. Qualcomm explains that the HARQ  
 processes are shared so the gNB can use dynamic grant.
- Whether we have GF (type 1) and SPS (type 2) configured for the same cell
- CATT sees now issue if they use different HARQ processes. LG thinks that we should allow  
 both. Nokia thinks that we shouldn't allow this and the HARQ processes should be shared.  
 Qualcomm and interdigital thinks we should share HARQ process for the same cell. Nokia  
 doesn't see the use case to allow this for the cell.
- Whether we support the multiple type 1 configuration(s) per cell
- Huawei considers the fact that we may have multiple BWP.
- RAN2 to discuss whether to suspend or release the configured resources of GF Type 1 of one  
 SCell when the SCell is deactivated.*
- Docomo thinks we should not release
  - Ericsson thinks from MAC point of view we should release and re-activate them when SCell  
 is activated.
  - Qualcomm is concerned that when an SCell is re-activated the gNB may need to re-configure  
 the resources anyway. Oppo thinks that the resources should be released. LG thinks that if  
 that is the case the network can release the resources before deactivating. Ericsson thinks  
 that the network doesn't necessarily know in advance.
  - Vivo thinks that upon re-activation we should start using the configuration.
- For Type 2 (SPS), when a BWP is deactivated, how to handle the configured resources  
 within the BWP?*
- Option 1: To suspend, i.e., to not transmit PUCCH and PUSCH within the BWP (if  
 any).*
  - Option 2: To clear configured resources within the BWP (if any).*
  - Nokia thinks that there is an overlapping case, if the resources are in overlapping area we  
 should keep the configuration.

- Samsung thinks that we should follow the same behaviour as SCell deactivation
- Interdigital thinks we should store the configuration. Qualcomm agrees and BWP switching can happen very frequently. Samsung doesn't think it should happen very often. Oppo thinks the SPS should be reactivated when you switch back.
- LG thinks that it may be simpler.
- ZTE thinks that clearing is a more straightforward and when re-activating BWP a DCI can be sent to reactivate

SPS – is the RRC configuration per cell or BWP

- Nokia thinks that for type 2 it is per cell. Qualcomm thinks that for type 2 there could still be benefit to configure the SPS.
- Mediatek thinks for Type 1 it is per BWP and for type 2 it is per cell.

Whether different RNTI or separate RNTIs are used

- Ericsson, Nokia, Samsung, QC, OPPO prefer to have the same RNTI

*RAN2 to discuss how to capture GF Type 1 and Type 2 (SPS) in MAC with the options including,*

- Ericsson thinks that based on the functionality from the MAC perspective we can have a unified naming and we can use SPS and configured grant and distinguish whether it is activated by physical layer and RRC. Qualcomm shares the view.
- Interdigital thinks we should be careful as even today we don't have unified named. In 5.3 and 5.7 we can keep using configured grant and assignment. In 5.10 we can change the name to something more generic and describe separately the type 1 and SPS. LG also prefers to have a separate name and use the differentiation in the LCP as well.
- Huawei doesn't think that we should use SPS as the umbrella terminology as the scheme are different.
- Vodafone and Intel also thinks that for the umbrella terminology we should use a different name.

#### **Agreements**

1. GF Type 1 resource shall be activated upon RRC configuration according to resource allocation in terms of periodicity and offset provided within the configuration
2. When GF Type 1 or SPS is released by RRC, the all corresponding configuration shall be released.
3. For SPS, the MAC entity shall clear the configured resource assignments immediately after transmitting confirmation MAC CE for the SPS release, as in LTE.
4. For GF Type 1, the MAC entity shall clear the configured uplink resource assignments immediately when receiving RRC reconfiguration message of GF Type 1 release.
5. Retransmissions (except for repetition) of GF Type 1 and SPS use dynamic grant
6. As in LTE, the pool of HARQ processes are shared between dynamic and configured grants.
7. From RAN2 perspective, type 1 and SPS cannot be configured for the same cell but can be configured for different cells at the same time.
8. From RAN2 perspective, at most one type 1 configuration is active at a time (e.g. one type 1 configuration per active BWP) per cell at least for Dec. freeze.
9. Upon SCell deactivation the GF type 1 the RRC configuration is kept. From the MAC point of view the resources are suspended (the UE is considered to not have a valid configured grant). Upon SCell activation the UE starts using the configured grant free resources.
10. The MAC entity shall clear the configured resources of one SCell for SPS when the SCell is deactivated.
11. Type 1 resource configuration can be configured per BWP and RRC configuration for SPS can be configure per BWP. A common RNTI for SPS and type 1 is configured per MAC entity.
12. For SPS when a BWP is deactivated, the from the MAC perspective the UE clears the configured resources within the BWP
13. The MAC entity shall clear all configured resources for Type1/ (SPS) when the TA timer associated with pTAG expires. Type 1 and SPS resources can be reactivated by RRC configuration and DCI respectively.
14. The MAC entity shall clear all configured resources for Type1/ (SPS) for all Serving Cells belonging to this TAG when TA timer associated with sTAG expires. Type 1 and SPS resources can be reactivated by RRC configuration and DCI respectively
15. The dynamic grant addressed to C-RNTI shall override the configured grant for this transmission in case of overlap in time domain, for type 1 and SPS.



- FFS if/how we handle the URLLC case (e.g. we only allow to override the configured grant iff the dynamic grant can be used for the higher priority data or if the URLLC can preempt eMBB transmission.
16. For SPS and type 1, if the received uplink grant or DL assignment addressed to SPS C-RNTI. If the NDI in the received HARQ information is 1, consider the NDI for the HARQ process not to be toggled, as in LTE.
  17. For SPS if the NDI in the received HARQ information is 0, it is for SPS activation/deactivation
  18. From RAN2 perspective, a timer T is introduced. While the timer is running the UE does not use the SPS or Type 1 resource for new transmission for this HARQ process (e.g. UE assumes ACK if the timer is not running).
  19. T is configured by RRC and it can be stopped when a dynamic grant is received for this HARQ process.
  20. It is started/restarted after the initial transmission/retransmission regardless of whether repetition is configured or not
  21. It is up to RAN1 to decide the definition of period which is related to HARQ ID determination
  22. "Configured grant" / "configured assignment" is kept in MAC
  23. Main umbrella name title "Transmission/reception without dynamic scheduling" and below is the description of Type 1 and Type 2
  24. Use Configured Grant Type 1 and Configured Grant Type 2 and DL SPS

- R2-1713174 TP outcome of [99bis#41][NR/UP] Open issues on SPS and GF discussion Rel-15 NR\_newRAT-Core Huawei, HiSilicon  
=> The TP is revised in R2-1714058
- R2-1714058 TP outcome of [99bis#41][NR/UP] Open issues on SPS and GF discussion Decision  
R2-1713174 Rel-15 NR\_newRAT-Core  
- Nokia thinks that we may need some further updates  
=> We will use Configured Scheduling (CS – RNTI)  
=> We should introduce the LTE text on PDCCH grant overriding the SPS grant

[100#23][NR UP/MAC] – TP on SPS/GF (Nokia)

- agreeable TP to be merged in main
  - Deadline: Dec. 6<sup>th</sup>
- => The TP is agreed in R2-1714058.

- R2-1714059 LS to RAN1 on GF/SPS agreements LS out Huawei  
=> Update action to "RAN2 respectfully asks RAN1 to take the above information into account in their work and to update their terminology according to RAN2 agreements"  
=> The LS is approved in R2-1714062 with change above

Not treated

- R2-1713917 DL SPS Operation in NR Samsung discussion
- R2-1713650 BWP timer restart for DL SPS LG Electronics Inc. discussion NR\_newRAT-Core
- R2-1713847 The Impact of SUL on UL Transmission without Grant Samsung Electronics discussion
- R2-1712857 Leftover issues of configured grants CATT discussion
- R2-1712937 Remaining issues for SPS in NR Ericsson discussion Rel-15 NR\_newRAT-Core

### 10.3.1.9 HARQ

- R2-1712699 CBG-based HARQ operations in MAC Samsung discussion Rel-15 NR\_newRAT-Core  
=> Noted

**Agreements:**

- 1: The CBG-specific parameters (i.e. CBGTI and CBGFI) in DCI for NR are not specified in the MAC specification.
- 2: No changes are required for UL HARQ operations in the MAC specification.
- 3: For DL HARQ operations, the MAC specification describes that MAC instructs PHY to perform soft combining and HARQ feedback operations.

R2-1713077 Handle ongoing HARQ process when BWP switching occurs      MediaTek Inc. discussion  
=> Noted

**Agreements:**

- 1: HARQ process can continue when BWP/SUL switching occurs.
- 2: No impact to the spec to capture this understanding
- 3: For same cell, one common HARQ entity is used for both UL and SUL

R2-1713175 Discussion on HARQ in NR      Huawei, HiSilicon      discussion      Rel-15 NR\_newRAT-Core

*UE would not flush HARQ buffers upon BWP/SUL switch*

- LG thinks that we never
  - Qualcomm thinks that we should have separate HARQ entities.
  - ZTE thinks that we should not allow retransmission across carriers. We can still have the same HARQ entity.
  - Lenovo thinks we can prevent the retransmission by gNB scheduling.
  - ZTE notes that this can imply retransmission across TDD and FDD
- => Noted

R2-1714060 LS to RAN1 on HARQ agreements      LS out      Samsung

=> Add RAN2 has removed the ACK generation procedure in the current running MAC specification and expects PHY to account for it in their procedure

=> Delete agreement 5

=> Updated agreement 6 "For same cell, one common HARQ entity is used for both UL and SUL"

=> The LS is approved in R2-1714061 with the changes above

Not treated

R2-1713807 Granularity of HARQ timing parameters with BWP      Qualcomm Incorporated discussion      Rel-15 NR\_newRAT-Core

R2-1713881 RAN2 aspect for HARQ in NR      LG Electronics UK      discussion      NR\_newRAT-Core

R2-1713810 On the impact of supplementary uplink on HARQ configurations      Qualcomm

### 10.3.1.10 DRX

*Contributions should focus on final critical issues/corrections for DRX*

R2-1712318 Remaining issues for DRX      Huawei, HiSilicon      discussion      Rel-15 NR\_newRAT-Core

- The unit of drx-RetransmissionTimerDL and drx-RetransmissionTimerUL is OFDM symbol corresponding to the numerology of the active BWP.
  - LG, Mediatek, lenovo thinks it should be absolute time. Ericsson, Nokia, Interdigital thinks slot. Huawei is fine with slot. ZTE thinks absolute time. Nokia thinks that defining the codes it may be difficult as we have to account for all possible numerologies.
  - Interdigital points that for HARQ RTT the K values are in terms of slot.
- => Noted

**Agreements**

- 1: As in LTE, when receiving a DCI indicating a DL transmission or configuring DL assignments for a HARQ process, drx-RetransmissionTimerDL of the corresponding HARQ process is stopped.
- 2: As in LTE, when receiving a DCI indicating a UL transmission or configuring UL grants for a HARQ process, drx-RetransmissionTimerUL of the corresponding HARQ process is stopped.
- 3: The unit of drx-RetransmissionTimerDL and drx-RetransmissionTimerUL is slot
- 4: UL HARQ RTT timer is started after the first PUSCH transmission of a bundle
- 5: The equation for DRX from R2-1713471 is used as a baseline (i.e. LTE formula with *drx-SlotOffset* added)

R2-1712858 Open Issues on DRX CATT discussion  
- Ericsson thinks that if we multiple by 32 it may be more complex  
=> Noted

R2-1712975 Remaining issues on DRX Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT  
=> Noted

R2-1713471 Remaining issues on DRX timers Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Noted

## BWP

R2-1713867 Issues on timer-based BWP switching Samsung discussion Rel-15  
=> Noted

R2-1713469 BWP Inactivity Timer and DRX Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Revised in R2-1713941

R2-1713941 BWP Inactivity Timer and DRX Ericsson discussion Rel-15 NR\_newRAT-Core

## Not treated

R2-1712212 Details of BWP inactivity timer ASUSTeK discussion Rel-15 NR\_newRAT-Core  
=> Moved from 10.3.1.13

R2-1712861 BWP Inactivity Timer for active UL BWP CATT discussion  
=> Moved from 10.3.1.13

## SPS

## Not treated

R2-1713470 SPS and SR in DRX Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1712700 DRX timer for SPS Samsung discussion Rel-15 NR\_newRAT-Core R2-1709012

R2-1713466 Modelling of PDCCH Monitoring Considering Duplex Modes Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1713802 Wakeup signaling for C-DRX mode Qualcomm Incorporated, Apple, OPPO discussion Rel-15 NR\_newRAT-Core R2-1711702

R2-1712442 Remaining issues on DRX ZTE CORPORATION discussion Rel-15 NR\_newRAT-Core

R2-1712201 DRX operation for cross slot PDCCH monitoring OPPO discussion Rel-15  
=> Noted

R2-1712204 The start condition of the UL HARQ RTT timer OPPO discussion Rel-15

R2-1712319 Enhancement of DRX Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core R2-1710209

R2-1712829 DRX inactivity timer for SPS UL skip vivo discussion R2-1708492

R2-1712834 Discussion on the remaining problems on DRX vivo discussion

R2-1712969 BWP switch on C-DRX Potevio discussion Rel-15

R2-1713244 Consideration on HARQ RTT Timer LG Electronics Mobile Research discussion NR\_newRAT-Core

R2-1713468 DRX with short on-duration and Wake-up signaling Ericsson discussion Rel-15 NR\_newRAT-Core

R2-1713803 Wakeup signaling for multi-beam systems Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core R2-1711703

## 10.3.1.11 Impact of PDCP duplication on MAC

*MAC CE for activation/deactivation of PDCU duplication*

*Aspects related to fallback to split bearer and handling of RLC/PDCP entities during activation/deactivation should be submitted in AI 10.3.3.5*

*This AI will not be treated*

## Not treated

R2-1712210 PDCP duplication and SCell (de-)activation ASUSTeK discussion Rel-15 NR\_newRAT-Core

R2-1712730 BSR procedure for data duplication Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core R2-1710757

R2-1712731 Cell deactivation impacts on PDCP duplication Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core R2-1710758

- R2-1712732 PBR configuration for duplication DRB Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core R2-1710759
- R2-1712833 Duplication deactivation due to Scell or BWP deactivation vivo discussion R2-1710958
- R2-1712859 Duplication activation/deactivation MAC CE CATT discussion R2-1710304
- R2-1712933 PDCP duplication control related to SCell control Ericsson discussion Rel-15  
NR\_newRAT-Core
- R2-1712966 PDCP duplication consideration Potevio discussion Rel-15

### 10.3.1.12 PHR

*Contributions should focus on final critical issues/corrections for PHR and finalizing PHR in the presence of beamforming*

- R2-1712916 PHR MAC CE format Lenovo, Motorola Mobility, Qualcomm Incorporated discussion  
Rel-15 NR\_newRAT-Core  
=> Noted

#### Agreements:

1. UE determines the PHR MAC CE - whether PH value for an activated Serving Cell is based on real transmission or a reference format - based on the downlink control information which has been received until and including the PDCCH occasion in which the first UL grant is received since a PHR has been triggered

- R2-1712431 Consideration on the mapping between PHR reported value and the measured quantity ZTE  
CORPORATION discussion Rel-15 NR\_newRAT-Core

=> For the EN-DC/MR-DC, the PHR measured values for LTE cell should be referred to 36.133 and the PHR measured values for NR cell should be referred to 38.133

=> send an LS to RAN4

- Whether two separate PHR table will be defined for FR1 and FR2, or 1 common PHR table will be used for both FR1 and FR2?

- R2-1714067 LS to RAN4 on PHR ZTE LS out  
=> The LS is approved in R2-1714074

- R2-1712860 RAN1 impact on RAN2 PHR design CATT discussion
- Huawei has a different understanding about RAN2 and further we should report type 3
- => the assumption is that the rapporteur will include the PHR types agreed by RAN1 at the end of the week in his running TS.
- => Noted

- R2-1714189 LS on SRS PHR reporting
- => Type 3 will be supported and be included in the MAC TS
- => Noted

- R2-1713484 Power Headroom Reporting in NREricsson discussion Rel-15 NR\_newRAT-Core  
*NR reuses LTE PHR MAC CE for single serving cell scenario.*
- => Noted
- Lenovo indicates that RAN1 agreed that we report PCmax for single cell scenario.
- Proposal 3: NR supports separate PHR triggering settings (e.g. dlPathLossChange) for SUL carrier and NR UL carrier in one cell.*
- Vivo agrees with the proposal since SUL and UL can have different power backoff.
  - Qualcomm thinks that periodic periods should be different but thresholds should be the same.
  - LG and Docomo think that we can apply the same principle as CA

Proposal 4 PHR is triggered at carrier switch between SUL carrier and NR UL carrier

- Lenovo understand that you can trigger very often the switch with DCI. Interdigital doesn't think that the switch should happen very often. ZTE thinks that we can switch every 10ms.
- LG and ZTE doesn't think this is needed.
- Xiaomi and Huawei, QC consider there are other cases where a switch happens, and it can be helpful.
- Convida thinks that we have enough triggers to ensure that we get the PHR.

- Samsung and CATT don't think this is an essential feature.

*Proposal 6: It is unnecessary to update PHR format and trigger with respect to the change of serving beams.*

- Interdigital thinks that we should include PHR for the beam and sees this as carrier aggregation. Huawei agrees and RAN1 agreed to beam level power control. We can include it in the format and discuss further with the triggers.
- CATT thinks that we have the pathloss change trigger. When we switch beams the pathloss may change and the PHR will be report. Interdigital thinks the benefit is that the network should know the PHR of the beam if it were to switch.
- Convida agrees that we should include it in the report.
- CATT thinks that RAN1 will not define beam management procedure based on PHR. Interdigital explains that this is for the case where the beams are already created. This is similar to CA where we have two independent power control loops.
- Mediatek asks if this is the same discussion as SUL. Interdigital doesn't think it is the same as pathloss reference for SUL is the same.
- Nokia

**Agreements:**

1. NR defines a MAC CE for single serving cell scenario (similar to LTE but with PCmax added if RAN1 has agreed that it has to be report). The UE determines which format to use similar to LTE.
2. NR does not support separate PHR triggering settings (e.g. dlPathLossChange) for SUL carrier and NR UL carrier in one cell.
3. No new PHR triggers or formats for beams are defined for now.

R2-1712788	Power Headroom Reporting for NR Core	InterDigital	discussion	Rel-15	NR_newRAT-Core
	=> Noted				
R2-1712915	PHR for NR CA	Lenovo, Motorola Mobility	discussion	Rel-15	NR_newRAT-Core
	=> Noted				
R2-1713486	Open issues for PHR in LTE-NR DC Core	Ericsson	discussion	Rel-15	NR_newRAT-Core
	=> As in LTE-LTE DC, after transmission of a PHR comprising PHs for both MCG and SCG by any UE MAC entity upon reception of a grant, the UE only cancels all triggered PHRs and reset timers (prohibit and periodic timer) in the corresponding CG.				
	=> Noted				
Not treated					
R2-1713177	PHR with multi-beam operation	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713485	Power Control Aspects	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713774	Guaranteed power for Power Headroom in EN-DC	Samsung Electronics	discussion		R2-1711798
R2-1712246	The power headroom report MAC CE	OPPO	discussion		
R2-1712788	Power Headroom Reporting for NR Core	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1713007	PHR impacts for beamforming	vivo	discussion		
R2-1713176	Remaining issues of PHR procedure and power management		discussion	Huawei, HiSilicon	
				Rel-15	NR_newRAT-Core
R2-1713574	PHR Text proposal	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713642	PHR in PDCP duplication with CA ITL		discussion	Rel-15	
R2-1713645	PHR for multi-beam operation	LG Electronics Inc.	discussion		NR_newRAT-Core R2-1711612
R2-1713775	PHR triggering event for beam change	Samsung Electronics	discussion		R2-1711800
R2-1713776	Extended PHR considering beam and TRxP change	Samsung Electronics	discussion		R2-1711801
R2-1713804	Power allocation and PHR for UL split bearer	Qualcomm Incorporated	discussion		Rel-15 NR_newRAT-Core R2-1711706

SUL and PHR

- R2-1712375 SUL impact on PHR Beijing Xiaomi Mobile Software discussion Rel-15
- R2-1712701 PHR and SUL in NR Samsung discussion Rel-15 NR\_newRAT-Core
- R2-1713002 Clarification on the SUL PHR reporting vivo discussion
- R2-1713178 Impacts of SUL on PHR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

10.3.1.13 Other

*Other aspects not included in the detailed agenda items.*

SUL

- R2-1712376 SUL impact on TA Beijing Xiaomi Mobile Software discussion Rel-15
  - => The UL and SUL of the same cell belong to the same TAG
  - => Noted
- R2-1712868 Timing Advance to support SUL Samsung Electronics discussion
  - => Noted

Other

- R2-1712703 Variables and constants for NR MAC specification Samsung discussion Rel-15
  - NR\_newRAT-Core
  - => Noted

**Agreements:**

- 1: The following RNTIs are defined for NR: RA-RNTI, Temporary C-RNTI, C-RNTI, SPS [align this with terminology in SPS/GF TP) C-RNTI, P-RNTI and SI-RNTI.
- 2: Whether to use TPC-PUCCH-RNTI and TPC-PUSCH-RNTI would be determined by RAN1, and RAN2 put Editor's Note.
- 3: As in LTE, a single P-RNTI (i.e. 0xFFFFE) and a single SI-RNTI (i.e. 0xFFFF) are defined for NR.
- 4: 14 values for the common search space are reserved for future use assuming the above RNTIs
- 5: The procedures of MAC reset in LTE are baseline for NR MAC reset
- 6: Partial MAC reset is not support in Rel-15 NR

- R2-1712702 MAC reset for NR Samsung discussion Rel-15 NR\_newRAT-Core
  - => Noted
- R2-1712704 Text proposal for a new clause for the handling of measurement gap Samsung
  - discussion Rel-15 NR\_newRAT-Core R2-1709018
  - Ericsson is concerned that there are other sections handling measurement gaps.
  - => The MAC entity does not transmit HARQ feedbacks, CSI feedbacks, and SRS during measurement gap.
  - => To have a normative clause for the handling of measurement gap. State in that section that there are other sections talking about measurement gap handling
  - => Noted
- R2-1713179 Uplink TA maintenance with multi-beam operation Huawei, HiSilicon discussion Rel-15
  - NR\_newRAT-Core
  - => The document is revised in R2-1713924
- R2-1713924 Uplink TA maintenance with multi-beam operation Huawei, HiSilicon discussion Rel-15
  - NR\_newRAT-Core R2-1713179
  - Proposal 1: Per beam/TRP TA maintenance should be supported in NR.**
  - Asustek thinks that this is needed
  - Interdigital doesn't think it is always needed as there are times they are collocated
  - => Wait for RAN1 to discuss this first
  - => Noted
- R2-1713508 L2 Header size and voice packet sizes for NR Ericsson discussion Rel-15
  - NR\_newRAT-Core

Proposal 1 RAN2 is kindly requested to send LS to SA4 about voice protocol overhead and special frames which are send frequently within the voice data.  
 - Qualcomm thinks that SA4 has already defined the codec and it is the ones already supported today.  
 => Send an LS to RAN1 to provide input about RAN2 UP protocol  
 => Noted

R2-1713527 DRAFT LS on VoIP packet sizes and transport blocks Ericsson LS out Rel-15  
 NR\_newRAT-Core To:RAN1, SA4  
 => Delete SA4, the paragraph on SA4, and the action  
 => With these changes the LS is approved in R2-1714070

R2-1713531 Aspects of Timing Advance Ericsson discussion NR\_newRAT-Core  
 Proposal 1 NR TA Command MAC CE uses LTE TA Command MAC CE format. If RAN1 requires larger adjustment range for higher numerologies RAN2 will add second TA Command MAC CE with extended TA Command field based on range indicated by RAN1.  
 => Restore clarification in subclause 5.2 that "A MAC entity stores or maintains NTA value upon expiry of associated timeAlignmentTimer  
 => Confirm that the values of TA fields are 0 to 63.  
 => Noted

R2-1713818 Potential new MAC CE NTT DOCOMO INC. discussion Rel-15 NR\_newRAT-Core  
 => Noted

R2-1713945 Details on SCell activation/ deactivation Samsung  
 => Noted

**Agreements:**

- 1: sCellDeactivationTimer is not applied to the SCell configured with PUCCH.
- 2: UE performs the same actions (except PTI report) as in LTE upon SCell activation.
- 3: UE performs the same actions (except PTI report) as in LTE upon SCell deactivation.

Not treated

R2-1712202 MAC SDU discard procedure OPPO discussion Rel-15  
 R2-1712211 Discussion on Timing Advance in NR ASUSTeK discussion Rel-15 NR\_newRAT-Core R2-1711082  
 R2-1713481 Further enhancement to the SR failure handling for multiple pending SRs Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1713533 MAC CEs for activating an RS resource and handling corresponding TCI states Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1713654 SPS with implicit SCell deactivation LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1711569  
 R2-1713655 Restart condition of sCellDeactivationTimer with skipping operation LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1711570  
 R2-1713656 Impact of RAN1's Discontinuous Transmission Indication ETSI discussion  
 R2-1713658 Impact of RAN1's Discontinuous Transmission Indication CATT discussion  
 R2-1713895 RAN2 consideration on user plane latency enhancement Samsung Electronics GmbH discussion R2-1711795

## 10.3.2 RLC

### 10.3.2.1 TS

*Latest TS 38.323, rapporteur inputs, etc*

*Including output from email discussion [99bis#13][NR UP/RLCMAC] – Running TS 386.322 – Mediatek  
 Please provide input to the rapporteur for corrections. Single/combined rapporteur TP is encouraged.*

R2-1712478 Draft TS 38.322 v110 MediaTek Inc. draft TS Rel-15 38.322 1.1.0 NR\_newRAT-Core  
 => The TS is endorsed

R2-1712981 EN-DC impacts to LTE RLC Huawei, HiSilicon CR Rel-15 36.322 14.1.0 0132  
 - B NR\_newRAT-Core  
 => We will only keep the reference in the reference sections  
 => the CR is agreed in R2-1714066

### 10.3.2.2 RLC header format

*Contributions should focus only on critical issues/corrections related to agreed RLC PDU format (e.g. not enhancements)*

### 10.3.2.3 RLC UM operation

*Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

### 10.3.2.4 Impact of PDCP duplication to RLC

*This AI will not be treated*

Not treated

R2-1712733	RLC optimization for packet duplication NR_newRAT-Core R2-1710760	Huawei, HiSilicon	discussion	Rel-15
R2-1712734	Further consideration on RLF indication NR_newRAT-Core R2-1710761	Huawei, HiSilicon	discussion	Rel-15
R2-1712735	RLC behaviours upon duplicate deactivation Rel-15 NR_newRAT-Core R2-1710762	Huawei, ASUSTek, HiSilicon	discussion	
R2-1713832	Interaction between RLC Entities for PDCP Duplication 15 NR_newRAT-Core R2-1711786	Samsung	discussion	Rel-
R2-1713833	RLC Max Retransmissions in CA Duplication NR_newRAT-Core R2-1711788	Samsung	discussion	Rel-15

### 10.3.2.5 RLC AM operation

*Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

*Contributions related to open issues discussed in email discussion are highly discouraged.*

R2-1713581 Addressing potentially excessive RETX\_COUNT increment in RLC AM Qualcomm  
 Incorporated discussion Rel-15 NR\_newRAT-Core  
*RETX\_COUNT is incremented at most once per status PDU.*  
 - LG supports the proposal  
 - Mediatek doesn't think we should change it. Maybe we can solve it by network setting proper values. Qualcomm thinks that to set the values the network would need to know in advance how many segments would be created.  
 => RETX\_COUNT is incremented at most once per status PDU  
 => Noted

R2-1712320 Clarification on RLC STATUS PDU construction Huawei, HiSilicon discussion Rel-  
 15 NR\_newRAT-Core R2-1710211  
 => No need to change anything  
 => Noted

Not treated

R2-1712936	RLC STATUS report format	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713682	Transmitter friendly RLC Status Report NR_newRAT-Core	Intel Corporation	discussion	Rel-15

### 10.3.2.6 Other

*Including output from email discussion [99bis#59][NR UP/RLC] Open issues related to RLC – Ericsson*

*Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

*Contributions related to open issues discussed in email discussion are highly discouraged.*

R2-1712934 Email discussion on RLC open issues Ericsson discussion Rel-15 NR\_newRAT-  
 Core  
 => Noted



*For polling, PDU\_WITHOUT\_POLL and BYTE\_WITHOUT\_POLL are updated (and reset) upon transmission opportunity is notified from lower layer*

- LG would like it to be upon assembly. Intel doesn't want to restrict UE implementation. Nokia raises a number of issues that can't be solved. Intel thinks that the UE can count while generating headers. Ericsson explains that we can have segmentation and we don't know the count.
- CATT thinks that because of the second agreement, count per PDU, upon transmission is a direct consequence

*It is specified that submission to lower layers is done when a transmission opportunity from lower layers is indicated*

- Intel, OPPO, Mediatek doesn't want to restrict the UE implementation. Ericsson doesn't see this restriction. The MAC header pre-construction can be done. There is no buffer in the MAC. LG thinks that this is related to segmentation, there can be cases where the grant is smaller than submitted PDU and then it needs to be segmented. Nokia agrees with LG and Ericsson. Huawei raises another issue that BSR is calculated at the RLC and do we now have to consider packets buffered in the MAC.

*Capture in normative text RLC SN gap is not allowed in the transmitter side. In NR, the RLC entity discards a RLC SDU only if no segments of the RLC SDU has been submitted to the lower layer*

- Mediatek thinks that RLC UM doesn't need to be added. We don't put many SN in the RLC UM only for segments and we don't need to restrict for UM.

*Whether "transmitter delivers to lower layer" or "transmitter submits to lower layer";*

- LG and Ericsson would like to align the terminology

*Whether current wording in all RLC sections reflect correctly P13, i.e. does not mandate that RLC PDU(s) are constructed "when" an RLC SDU is received from upper layer;*

- Nokia raised this issue. Lenovo, LG explains that we don't specify the timing and we leave it up to UE implementation.
- Huawei agrees with Nokia and maybe we can add a Note. LG explains that in PDCP we use "for each PDU" to achieve the point that when to generate the PDU is up to UE implementation.

#### **Agreements:**

1. RLC entity release procedure is specified in RLC specification (triggering discarding of all RLC SDUs and PDUs).
2. Restructure RLC sections, i.e. common section "RLC entity handling" with subsections "RLC establishment", "RLC re-establishment", "RLC release".
3. The TS 38.322 description on Status report format is sufficient to capture the behaviour of Status PDU construction, when a grant is not large enough to accommodate the status information of all missing PDUs
4. From a procedure specification perspective, retransmissions and acknowledgements are defined to be associated with RLC SDU (segments).
5. For polling, PDU\_WITHOUT\_POLL and BYTE\_WITHOUT\_POLL are updated (and reset) upon transmission opportunity is notified from lower layer
6. Segments of SDUs that have not yet been included in a data PDU should be considered as RLC data volume
7. It is specified that submission to lower layers is done when a transmission opportunity from lower layers is indicated. This does not preclude the UE doing preprocessing at the RLC layer and pre-creating MAC sub-headers. No additional note is added to the specification.
8. Capture for RLC AM in normative text RLC SN gap is not allowed in the transmitter side. In NR, the RLC entity discards a RLC SDU only if no segments of the RLC SDU has been submitted to the lower layer (i.e. *The transmitting side of an AM RLC entity shall not introduce an RLC SN gap when discarding an RLC SDU*)
9. No need is seen to align the transmit procedures for AM and UM
10. No changes/optimizations for the ACK\_SN setting in a STATUS PDU.

11. No changes to Figure 4.2.1.2.1-1 and Figure 4.2.1.3.1-1 wrt header pre-creation/pre-processing
12. When receiving an RLC SDU from upper layers, it is up to the UE implementation when to construct an RLC AMD PDU
13. Align definition of the state variable TX\_Next for RLC AM with description in procedural text by modifying the definition of TX\_Next as follows: "This state variable holds the value of the SN to be assigned for the next newly generated AMD PDU. It is initially set to 0, and is updated whenever the AM RLC entity constructs an AMD PDU with SN = TX\_Next and contains a RLC SDU or the last segment of a RLC SDU".
14. Specify a unified behaviour across all specs UE submits to lower layer and delivers to upper layers

- R2-1712935 TP on RLC open issue email discussion Ericsson discussion Rel-15 NR\_newRAT-Core  
=> The TP is revised in R2-1714068
- R2-1714068 TP on RLC open issue email discussion Ericsson discussion Discussion R2-1712935 Rel-15 NR\_newRAT-Core  
=> change in section 5.3.1 (if needed and split the procedure in three steps)  
=> The TP is agreed in R2-1714073 with the changes above
- R2-1713657 Simplification of RLC entity re-establishment LG Electronics Polska discussion NR\_newRAT-Core  
=> the discard procedure needs to be added to the PDCP spec (LG will do it)  
=> The TP is agreed
- Not treated
- R2-1712321 Impacts of RLC Pre-processing to BSR Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- R2-1712328 Updated RLC SDU discard procedure due to MAC layer discard procedure OPPO discussion
- R2-1712690 Submission of RLC PDUs to MAC Intel Corporation discussion Rel-15 NR\_newRAT-Core
- R2-1712817 RLC TP for BSR Fujitsu discussion Rel-15 NR\_newRAT-Core Withdrawn

### 10.3.3 PDCP

#### 10.3.3.1 TS

*Latest TS 38.323, rapporteur inputs, etc*

*Including output from email discussion [99bis#14][NR UP/PDCPMAC] – Running TS 386.323 – LG  
Please provide input to the rapporteur for corrections. Single/combined rapporteur TP is encouraged.*

- R2-1713660 Draft TS 38.323 v101 LG Electronics Inc. (PDCP rapporteur) draft TR Rel-15  
38.323 1.0.1 NR\_newRAT-Core  
=> The TS is endorsed

- R2-1712807 Text Proposal on PDCP Data Recovery procedure for EN-DC Samsung R&D Institute India  
discussion Rel-15 R2-1710905  
=> The TP is agreed

#### 10.3.3.2 PDCP PDU formats

*Contributions should focus only on critical issues/corrections related to agreed PDCP PDU format (e.g. not enhancements)*

#### 10.3.3.3 PDCP receive operation

*Contributions should focus only on critical remaining issues/corrections*

#### 10.3.3.4 UL data split

*Including output of email discussion [99bis#44][NR UP/PDCP] – TP for PDCP pre-processing – LG  
Max 1 contribution per company focusing on critical issues NOT identified/addressed by email discussion – supporting TP included in the contribution*

R2-1713661 Summary of E-mail [99bis#44] PDCP pre-processing report Rel-15 NR\_newRAT-Core LG Electronics Inc. (E-mail rapporteur)  
=> Noted

Agree on the NOTE, "The transmitting PDCP entity is allowed to submit PDCP PDUs to lower layers before receiving request from lower layers. It is up to UE implementation how many PDCP PDUs are submitted to lower layers before receiving request from lower layers."  
- Nokia asks what is the purpose of the note. LG thinks majority company would like a note. Nokia doesn't see how this resolve a UE behaving badly. CATT, Sequans has sympathy with Nokia. Sequans explains that the normative text we already allow pre-processing.  
=> This note is not needed

Add the guideline text to the NOTE of Proposal 1, "If the transmitting PDCP entity is associated with two RLC entities, the UE should minimize the amount of PDCP PDUs submitted to lower layers before receiving request from lower layers in order to minimize the transmission gap between PDCP SNs of PDCP PDUs submitted to two associated RLC entities."  
- Nokia asks what is meant by minimization and we should have a consequence.

**Agreements:**

Add the guideline text to the NOTE of Proposal 1, "If the transmitting PDCP entity is associated with two RLC entities, the UE should minimize the amount of PDCP PDUs submitted to lower layers before receiving request from lower layers and minimize the PDCP SN gap between PDCP PDUs submitted to two associated RLC entities to minimize re-ordering delays in receiving side"

R2-1713662 TP of E-mail [99bis#44] PDCP pre-processing discussion Rel-15 NR\_newRAT-Core LG Electronics Inc. (E-mail rapporteur)  
=> Not treated

R2-1713663 PDCP data volume indication to MAC LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core

**Agreements [CBF]**

1. For split bearers, instead of *ul-DataSplitDRB-ViaSCG*, use generic name *primaryPath* to indicate the preferred RLC entity. The RLC entities can be in the same cell group or different cell groups. A RLC type IE is not needed. The presence of the IE *primaryPath* is sufficient.
2. For split bearers, call the MAC entity as "MAC entity associated with primary/secondary RLC".
3. For split bearers, use infinity value of *ul-DataSplitThreshold* to realize UL path restriction

R2-1713382 RLC buffer handling for pre-processed data Rel-15 NR\_newRAT Nokia, Nokia Shanghai Bell discussion  
- LG, QC, Mediatek, Intel and Lenovo, thinks that pre-processed data are reported as RLC data volume and we agreed that we will minimize amount of data.  
- Nokia thinks that this has the consequence of forcing the network to schedule the UE and the threshold is not very useful. CATT understands the consequence but if the UE is not being scheduled it can still re-process the data so the network doesn't have to schedule the UE.  
- Sequans doesn't want to mandate the UE to re-process. Nokia thinks that we need to re-process anyways for other use cases  
=> Noted

R2-1713580 BSR reporting for UL split bearer Rel-15 NR\_newRAT-Core Qualcomm Incorporated discussion  
=> Noted

**Agreements**

1. No change in BSR reporting, PDCP data volume calculation, RLC data volume calculation are required due to preprocessing for UL split

R2-1713665 UL split with LTE link Sequans Communications discussion NR\_newRAT-Core

*Proposal 1 for split bearers, PDCP may submit PDCP PDU to LTE lower layers only when requested by LTE lower layers*

*Proposal 2: when comparing with the PDCP split threshold the UE should take into account the PDCP data volume and the RLC data volume pending for initial transmission in NR link(s)*

- LG thinks that we don't need to change anything in the current text.
  - Mediatek thinks that we need to update the PDCP spec to refer to LTE – data available for transmission. In LTE we do not use the RLC data volume so in NR PDCP the LTE data volume should be zero.
  - Oppo thinks this is a reasonable proposal for split bearer.
  - Sequans indicates that if we have proposal 2 a consequence is that we shouldn't submit pre-processed data. TCL agrees with both proposals.
  - Nokia and Ericsson think we shouldn't change anything.
- => No restriction is specified for the EN-DC case.  
=> Noted

Not treated

R2-1712931	PDCP BSR reporting at UL split	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1712479	PDCP data recovery for UL split bearer	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
	R2-1711547				
R2-1712186	Left issue for split bearer	OPPO	discussion	Rel-15	NR_newRAT-Core
R2-1712480	NR PDCP enhancements to support LTE RLC	MediaTek Inc.	discussion	Rel-15	
	NR_newRAT-Core				
R2-1712818	Pre-processing restriction	Fujitsu	discussion	Rel-15	NR_newRAT-Core
R2-1712907	Remaining issues with UL split bearer	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713008	UE behavior at UL path switch	vivo	discussion		Withdrawn

### 10.3.3.5 PDCP duplication

*This AI will not be treated*

Not treated

R2-1712308	Interaction between PDCP and RLC Entities for duplication in NR-NR DC	TCL	discussion	Rel-15	NR_newRAT-Core
R2-1712435	Consideration on PDCP Duplication in NR	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1712736	PDCP operation for packet duplication	Huawei, ASUSTek, HiSilicon	discussion	Rel-15	NR_newRAT-Core
	R2-1710763				
R2-1712737	PDCP data volume calculation for packet duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
	R2-1710764				
R2-1712738	Clarification on bearer type for packet duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
	R2-1710765				
R2-1712739	Enhancements for DL Packet Duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
	R2-1710766				
R2-1712914	PDCP packet duplication	Lenovo, Motorola Mobility	discussion	Rel-15	NR_newRAT-Core
	R2-1711041				
R2-1712926	PDCP duplication and discard	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1712928	PDCP duplication for AM operation	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1712929	PDCP duplication transmit operation	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1712932	PDCP data volume reporting in duplication	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1712964	Discussion on PDCP data volume calculation during PDCP Duplication	Institute India	discussion	Rel-15	Samsung R&D
	R2-1711123				
R2-1712965	Discussion on Uplink Packet Duplication	III	discussion	Rel-15	
R2-1713004	Layer-2 behaviors of PDCP duplication deactivation	vivo	discussion	Rel-15	R2-1710970
R2-1713005	PDCP duplication impacts on LCP	vivo	discussion	Rel-15	R2-1710968
R2-1713006	Discussion on the PDCP data volume	vivo	discussion	Rel-15	R2-1710966

R2-1713009	UE layer-2 behaviors at SCell-failure	vivo	discussion		
R2-1713584	PDCP duplication	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core	R2-1711544
R2-1713641	Configuration of PDCP duplication on default DRB	ITL	discussion	Rel-15	
R2-1713829	Activation and Deactivation of PDCP Duplication	Samsung	discussion	Rel-15 NR_newRAT-Core	R2-1711782
R2-1713830	Discussion on CA Duplication	Samsung	discussion	Rel-15 NR_newRAT-Core	R2-1711783
R2-1713831	Initial State of Uplink Packet Duplication	Samsung	discussion	Rel-15 NR_newRAT-Core	R2-1711785

### 10.3.3.6 Support for RoHC

### 10.3.3.7 Other

*Contributions should focus only on critical remaining issues/corrections*

R2-1712187	PDCP handling for UL path switch	OPPO	discussion	Rel-15 NR_newRAT-Core	
	<i>Proposal 1</i>		<i>During UL path switch, re-transmit all the PDCP PDUs previously submitted to the old path for which the successful delivery has not been confirmed by lower layers</i>		
	<i>Proposal 2</i>		<i>No need to do PDCP status report during UL path switch.</i>		
	<i>Proposal 3</i>		<i>RLC re-establishment is not needed for UL path switch.</i>		
	<i>Proposal 4</i>		<i>RLC data discard for the old path is triggered before UL path switch.</i>		
	-	Intel	thinks that we don't need to discuss as we concluded in main session to have an explicit indication whether to perform data recovery. Nokia doesn't see the need to discuss this again. LG and QC don't support. Qualcomm thinks that there are many corner cases to discuss.		
	-	Lenovo and Sequans	support this.		
			<i>How to deal with pre-processing</i>		
	-	Mediatek	is concerned that we may flush the data that we pre-processed. Oppo agrees.		
	=>		No additional things need to be specified		
	=>		Noted		

R2-1713727	SDAP header excluded from PDCP ciphering	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core	R2-1710906
	-	Intel	shares the concerns		
	-	Samsung	thinks that there are different implementations and some may have a problem with this proposal. Huawei, LG doesn't agree with the proposal and is violating the cross layers. Qualcomm thinks that there should have been one layer. Nokia confirms and the split is an artificial split.		
	-	Intel	thinks this is aligned with ROHC agreement.		
	-	Mediatek	thinks that it is more important that we finalize the header size.		
	-	Nokia	supports the proposal and there is some benefits with the CU/DU		
	-	Qualcomm	thinks that having to de-cipher before knowing where to route data is forcing steps in the implementations.		
	-	Mediatek	asks if there are any concern with not ciphering the SDAP header.		
	-	Intel	explains that it is easier to do ROHC, encrypt and the put the header, other than doing ROHC, putting header, and then ciphering		

**Agreement**

=> The PDCP ciphering function shall not be applied to SDAP header

Not treated

R2-1712691	UL path switching	Intel Corporation	discussion	Rel-15 NR_newRAT-Core	
R2-1712925	PDCP SN reconfiguration at handover	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713563	L2 actions upon UL path switch	Sequans Communications	discussion	NR_newRAT-Core	
R2-1713714	PDCP data recovery for SRB	LG Electronics France	discussion	Rel-15 NR_newRAT-Core	

R2-1713715	UE behaviour upon UL path switch NR_newRAT-Core	LG Electronics France	discussion	Rel-15
R2-1712930	PDCP UL switch procedure	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1712902	Behavior of t-Reordering timer during PDCP re-establishment for SRB and AM DRB Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	
R2-1712927	UP timers in PDCP	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713383	Clarification of agreement on header-only PDCP Data PDU discussion	Rel-15 NR_newRAT	Nokia, Nokia Shanghai Bell	
R2-1713827	PDCP parameter applicability for SRB NR_newRAT-Core	NTT DOCOMO INC.	discussion	Rel-15

### 10.3.4 SDAP

*This AI is down-prioritized and will be treated if issues that require RAN2 attention for other WGs to progress are identified*

#### 10.3.4.1 TS

*Latest TS 37.324, rapporteur inputs, etc*

R2-1713458	Draft TS 37.324 v111	Rapporteur (Huawei)	draft TS	Rel-15 37.324 1.1.1	NR_newRAT-Core
	=> The TS is endorsed				

Not treated

R2-1712164	Text proposal for the SDAP entity establishment and release 15 37.324 1.0.1 NR_newRAT-Core	Samsung	pCR	Rel-15	
R2-1712165	Text proposal on the number of SDAP entities NR_newRAT-Core	Samsung	pCR	Rel-15 37.324 1.0.1	
R2-1712392	Number of SDAP Entities for NR DC NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15	
R2-1713459	List of Editor's Notes from TS 37.324 v1.1.0 15 37.324 NR_newRAT-Core	Rapporteur (Huawei)	discussion	Rel-15	
R2-1713863	Alignment with QoS section in TS 23.501 NR_newRAT-Core	SHARP Corporation	discussion	Rel-15	

#### 10.3.4.2 Header Format

*Details of header format only (e.g. size of QFI and use of one bit QFI). Progress on some aspects may require SA2 response.*

R2-1712481	SDAP header design based on NAS 5G QoS requirements 15 NR_newRAT-Core	MediaTek Inc.	discussion	Rel-15
	<ul style="list-style-type: none"> <li>- Samsung thinks that we should respect SA2 7 bit QFI. Xioami and Vivo. Samsung thinks that the 1 bit RQI can work.</li> <li>- Nokia understands that SA2 would have liked to but doesn't mean 6 didn't work.</li> <li>- CATT thinks that SA2 had very clear reason why. Mediatek thinks not all UEs have to support all these flows.</li> <li>- Ericsson thinks that SA2 is open to doing some remapping.</li> <li>- Huawei shares MEdiatek view and 6 bits can work.</li> <li>- Huawei thinks that RAN2 has a work around even if SA2/CT1 decides 7 or 8 bits QFI.</li> </ul>			
	=> Noted			

#### Agreements

=> SDAP header remains fixed to 8 bits. The details are FFS.

Not treated

R2-1712166	Further considerations on the QoS header format NR_newRAT-Core	Samsung	discussion	Rel-15
R2-1712177	Clarification on RQI bits	TCL	discussion	NR_newRAT-Core
R2-1712200	SDAP PDU format	OPPO	discussion	Rel-15
R2-1712377	Consideration on reflective QoS of SDAP 15	Beijing Xiaomi Mobile Software	discussion	Rel-15

R2-1712393	Further Discussion on SDAP Header Format 15 NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1712437	Discussion on SDAP DATA PDU for reflective QoS Rel-15 NR_newRAT-Core R2-1710439	ZTE CORPORATION	discussion	
R2-1712862	SDAP header format	CATT	discussion	
R2-1712923	SDAP Header Format	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713231	Considerations on one bit RQI 1710394	CMCC	discussion	Rel-15 NR_newRAT-Core R2-
R2-1713583	Considerations on Reflective QoS Qualcomm Incorporated		discussion	Rel-15 NR_newRAT-Core
R2-1713586	Location of QoS Flow ID in UL and DL packet 15 NR_newRAT-Core R2-1703023	LG Electronics France	discussion	Rel-15
R2-1713669	SDAP header format	LG Electronics	discussion	NR_newRAT-Core R2-1711755

### 10.3.4.3 Other

*QoS flow remapping and handover within the same cell (max 1 contribution per company for this topic)*

*Other SDAP issues*

Not treated

R2-1712167	Further considerations on a common AS/NAS reflective QoS indicator discussion Rel-15 NR_newRAT-Core			Samsung
R2-1712173	Issues with RQI setting for AS updating Core R2-1710166	TCL, vivo, CATT	discussion	NR_newRAT-Core
R2-1712174	QFI Presence for AS Level Reflective QoS R2-1710167	STCL, CATT	discussion	NR_newRAT-Core
R2-1712206	Presence of UL SDAP header on default DRB NR_newRAT-Core R2-1711077	ASUSTeK	discussion	Rel-15
R2-1712207	Discussion on changing presence of SDAP header NR_newRAT-Core R2-1711078	ASUSTeK	discussion	Rel-15
R2-1712317	BSR enhancement for SDAP Core R2-1710205	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712361	New QoS flow on the Default Bearer Rel-15 NR_newRAT	Nokia, Mediatek, Nokia Shanghai Bell	discussion	
R2-1712362	Reflective QoS Control Withdrawn	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1712363	QoS Flow Remapping	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1712364	Default QoS Profile	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT
R2-1712378	QoS Flow Remapping	Beijing Xiaomi Mobile Software	discussion	Rel-15 R2-1711068
R2-1712394	SDAP (re)configuration	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712395	QoS Flow to DRB Re-Mapping Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712396	Lossless Handover of QoS Flow Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712397	QoS Flow Level Offloading in NR-DC NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1712482	In-order delivery during QoS flow relocation NR_newRAT-Core R2-1710699	MediaTek Inc.	discussion	Rel-15
R2-1712920	Issues with the existing QoS framework (Stage 3) NR_newRAT-Core	Ericsson	discussion	Rel-15
R2-1712922	SDAP entity establishment	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1712924	SDAP configurations aspects	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1712963	QoS Flow Remapping in Handover and Within the Same Cell Rel-15 NR_newRAT-Core		discussion	Ericsson
R2-1713003	Consideration on BSR for SDAP	vivo	discussion	R2-1710969
R2-1713505	Number of SDAP entities in UE for NR DC Core	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713582	SDAP remaining issues R2-1711543	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1713609	QoS flow to DRB remapping Core R2-1711558	LG Electronics France	discussion	Rel-15 NR_newRAT-Core
R2-1713647	Reflective QoS acknowledgement ITR		discussion	Rel-15 R2-1711668

- R2-1713648 QoS Flow Remapping ITL discussion Rel-15
- R2-1713659 Configurability for the presence of SDAP header LG Electronics discussion NR\_newRAT-Core R2-1709068
- R2-1713666 Considerations on release of a mapping of QoS flow to DRB LG Electronics discussion NR\_newRAT-Core R2-1711748
- R2-1713667 Discussion on SDAP entity establishment in DC LG Electronics discussion NR\_newRAT-Core R2-1709074
- R2-1713668 Further discussion on SDAP Configuration LG Electronics discussion NR\_newRAT-Core R2-1709071

## 10.4 Stage 3 control plane

### 10.4.1 NR RRC

#### 10.4.1.1 TS

*Latest TS 38.331, other rapporteur inputs, etc. Please submit any new text proposals to the appropriate agenda item. Note specification methodology has been given a separate AI for RRC.  
Including output from email discussion [99bis#16][NR] TS 38.331 (Ericsson)  
This agenda item is relevant to EN-DC completion.*

- R2-1713629 Draft TS 38.331 v0.2.0 Ericsson (Rapporteur) draft TS Rel-15 38.331 0.2.0 NR\_newRAT-Core
  - Samsung think we did not agree the failure causes in the SCG failure that are included in the draft TS. Ericsson think it came from the previous agreed TP on SCG failure.
  - => Comments to the rapporteur invited
  - => New version including latest RAN1 parameter list in R2-1714126
- R2-1714126 Draft TS 38.331 v0.3.0 Ericsson (Rapporteur) draft TS Rel-15 38.331 0.3.0 NR\_newRAT-Core
  - ✉ **[100#17][NR] 38.331 (Ericsson)**
  - Intended outcome: Agreed TS for submission to RAN for (one step) approval
  - Deadline: Thursday 2017-12-07
  - => Agreed in R2-1714259.
- R2-1713630 TS38.331 Open Issues Ericsson (Rapporteur) discussion Rel-15 NR\_newRAT-Core
  - => Noted

#### 10.4.1.2 Specification methodology

*This agenda item is relevant to EN-DC completion.*

- R2-1713500 NR RRC specification, protocol extension aspects & introduction of SA Samsung Telecommunications discussion Rel-15 NR\_newRAT-Core
  - Ericsson think there is little point to try to have a running CR until after March. Samsung thinks it depends on the changes as some parts will be independent of the EN-DC parts of the spec.

#### Agreements

- 1 Develop the running CR introducing the SA related changes using the regular non-critical extension approach as baseline. Critical extensions should however be considered in specific cases e.g. when a change of information structure is highly desirable
- 2 In Q1 the running CR can start to develop text for those sections that do not contains anything related to EN-DC. Sections that contain text on EN-DC can be updated to add SA aspects after March.

=> Other methodology aspects can be discussed in offline session (Ericsson)

- R2-1714172 TS38.331 Methodology session Ericsson report
  - => ASN.1 review plan is agreed



R2-1712541	ASN.1 handling of SA specific fields in NSA 15	Huawei, HiSilicon	discussion	Rel-15
R2-1712542	Extensibility in NR ASN.1	Huawei, HiSilicon	discussion	Rel-15
R2-1713922	Generic error handling in NR RRC NR_newRAT-Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15

### 10.4.1.3 Connection control procedures

No documents should be submitted to 10.4.1.3. Please submit to 10.4.1.3.x.

#### 10.4.1.3.1 Connection reconfiguration message and bearer handling

Structure and general content of RRCConnectionReconfiguration message. Including the related additions to the LTE RRCConnectionReconfiguration for EN-DC operation.

Including output from email discussion [99bis#17][NR] Reconfiguration and bearer handling (Ericsson)

Any contributions should focus on critical issues NOT resolved by the email discussion and a supporting TP should be included in the contribution.

This agenda item is relevant to EN-DC completion.

R2-1713341	Email disc 17: TP for NR RRC Reconfiguration NR_newRAT-Core	Ericsson	discussion	Rel-15
	<ul style="list-style-type: none"> <li>- Samsung think that both direction of NR/LTE PDCP version change should be captured in the LTE RRC spec, to keep NR RRC clean. Ericsson think it is triggered from NR RRC and hence should be captured there.</li> <li>- Samsung also had a comment on the RLC re-establishment indicator whether this is used in all cases that re-establishment is required. Ericsson prefer that the triggering for synchronous reconfiguration would be implicit.</li> <li>- Intel wonder if the order of execution should be radio bearer first and then lower layer configuration. Ericsson think that RLC re-establishment should be first and then PDCP re-establishment. Think the DRB to LCH linking can be done with any order.</li> <li>- Samsung wonder if T312 is needed in the NR spec and thought it would be discussed after December.</li> </ul> <p>=&gt; Noted (already captured in the latest version of the TS) =&gt; Check offline how to update the text so that RLC re-establishment indicator is always set in the case of a synchronous reconfiguration, instead of being implicitly triggered.</p>			

R2-1713342	Email disc 17: TP for LTE RRCConnectionReconfiguration 15 NR_newRAT-Core	Ericsson	discussion	Rel-15
	=> Noted (already captured in the latest version of the running CR)			

R2-1712666	Delta/Full configuration for bearer type change and SN change discussion Rel-15 NR_newRAT-Core	Intel Corporation		
	<p>P2</p> <ul style="list-style-type: none"> <li>- Intel explain that the question is whether we want to avoid doing release and add which is a lossy procedure.</li> <li>- HTC think in LTE we do not support lossless full configuration. Intel think it will be more frequency than in LTE as it is for bearer type change.</li> <li>- LG think the procedure will be more complex than just keeping the PDCP SNs.</li> <li>- Ericsson think if that if the target SN does not understand the source SN bearer configuration then we can rely on the LTE full configuration. CATT agree with Ericsson as the bearer type change is not so frequency.</li> </ul>			

#### Agreements

1 To support delta configuration for bearer type change between MCG (split) DRB and SCG (split) DRB and SN change, the 'SCGConfigInfo' and 'SCGConfig' INMs should include both radioBearerConfig containers and nr-secondaryCellGroupConfig container.

=> Handover case also needs to be checked and aligned with the previous agreement.

R2-1713390	Full configuration in EN-DC moved from 10.4.1.3.4 to 10.4.1.3.1	Ericsson	discussion	Rel-15 NR_newRAT-Core
	<ul style="list-style-type: none"> <li>- HTC think that a full config flag is simpler than using the release flag. Qualcomm agree.</li> <li>- Intel support proposal 2 as it is a simple way to achieve the full configuration.</li> </ul>			

- => Offline discussion to try to progress how the full configuration works (Offline discussion #21, Ericsson)
- Update from offline:

R2-1714207 OFFLINE#21 Full configuration in EN-DC (Ericsson) Ericsson  
=> Revised in R2-17144228 to update proposal 1

**Agreements**

- 1 In case the target eNB doesn't understand the MCG part of the configuration but the target SgNB does understand the SCG part
  - MN sets the LTE fullconfig flag in the LTE RRCConnectionReconfiguration message, and this will release both MCG and SCG configuration.
  - MN doesn't include the scg-configInfo in the sgNB addition request (if an SN is added)

R2-1714228 OFFLINE#21 Full configuration in EN-DC (Ericsson) Ericsson

**Agreements**

- 1: In case the target eNB understands the MCG part of the configuration but the target SgNB doesn't understand the SCG part
  - SN indicates to the MN that it has applied full SCG configuration
  - Impacted bearers in indicated in the drb-toReleaseList
  - MN sets the en-DC-release flag to TRUE in the LTE RRCConnectionReconfiguration message sent to the UE

=> Inter node signalling can be discussed as part of the email discussion on inter node messages.

R2-1712667 RRC signaling for PDCP data recovery Intel Corporation discussion Rel-15 NR\_newRAT-Core  
=> Already covered by the TP from the email discussion.

R2-1712689 Addition and Release of SCG configuration over LTE RRC Intel Corporation discussion Rel-15 NR\_newRAT-Core  
=> Noted

R2-1713343 Some remaining terminology issues Ericsson discussion Rel-15 NR\_newRAT-Core

**Agreements**

- 1 Do not use term HO nor SCG Change nor SCG refresh in Stage-3 RRC but instead
  - 1) Reconfiguration with sync with key change
  - 2) Reconfiguration with sync without key change
- 2 Within the NR RRC spec the term SpCell refers to the primary cell of the master and the secondary cell group. The term PSCell can be defined as SpCell of SN and PCell is defined as the SpCell of the MN

R2-1713388 LTE re-establishment when using NR PDCP (TP to 36.331 and 38.331) Ericsson discussion Rel-15 NR\_newRAT-Core

- Lenovo think this reduces the chances to successfully re-establishment. Ericsson think in this case it would result in extra reconfiguration when the cell does support NR PDCP.
- IDC think the common case is reestablishment to a cell that does support NR PDCP.
- Intel wonder why reject is needed and full configuration is not used.
- HTC think that full configuration is not possible in the re-establishment , it can only be done in the first reconfiguration.
- OPPO think this proposal has some benefit when the cell supports EN-DC.

=> Offline discussion to progress the SRB1 issue to ensure that the mechanism works when the UE attempts to re-establish on an eNB that supports EN-DC, and when the UE attempts to

re-establish on a legacy eNB that has the context but cannot understand the full context.  
(Offline discussion #22, Ericsson)

**Agreements**

- 1 For re-establishment in LTE, UE releases the lower layer SCG configuration (i.e. nr-secondaryCellGroupConfig) at RRC re-establishment while the DRB configuration (incl. the NR PDCP configuration received in radioBearerConfig) is kept.

R2-1714208 OFFLINE#22 LTE re-establishment and resume while using NR PDCP Ericsson

**Agreements**

- 1 On re-establishment,
  - UE reverts to using LTE PDCP for SRB1
  - If target eNB supports NR-PDCP, it can use RRCConnectionReconfiguration to revert the PDCP version of SRB1 or any other bearers to NR
  - If target eNB doesn't support NR-PDCP, it can perform full configuration to revert the PDCP version of all bearers to LTE PDCP.
- 2 On resume,
  - UE reverts to using LTE PDCP for SRB1
- 3 The RRCResume message extend to enable configuration of bearers with NR PDCP

R2-1713530 Capturing network restrictions and bearer type changes in Stage-3 Ericsson discussion  
Rel-15 NR\_newRAT-Core

**Agreements**

- 1 Related to bearer type changes, capture the cases that are not supported as network restrictions in the conditions.
- 2 Capture in the conditions the network restrictions that when security key change is performed, PDCP re-establishment as well as synchronised reconfiguration need to be triggered.

R2-1712219 Corrections to TP in RRC(Connection)Reconfiguration OPPO discussion Rel-15  
NR\_newRAT-Core  
=> Noted

R2-1713344 RRC Reconfiguration of NR-NR DC and NE-DC Ericsson discussion Rel-15  
NR\_newRAT-Core

**Agreement**

- 1 For EN-DC for Dec 17, the UE behaviour will only be specified for the case that the embedded NR RRC PDU in the LTE RRCConnectionReconfiguration includes secondaryCellGroupToAddModList and/or measConfig and nothing else.

10.4.1.3.2 Connection reconfiguration message - L2 parameters

*L2 parameter content of RRCConnectionReconfiguration message.  
Including output from email discussion [99bis#18][NR] L2 parameters in RRC (Huawei)  
Any contributions should focus on critical issues NOT resolved by the email discussion and a supporting TP should be included in the contribution..  
This agenda item is relevant to EN-DC completion.*

R2-1712578 L2 parameter content of RRCReconfiguration message Huawei (Rapporteur) discussion  
Rel-15 NR\_newRAT-Core  
Discussion on on-duration timer  
- Ericsson, CATT, LG thinks that slot level is sufficient  
-

**Agreements**

1. Information for PDCP duplication / UL split is provided in PDCP-Config (not in LCH-Config). In the ASN.1, "configuredRLC" is changed to "primaryRLC" but can be changed if another name seems more suitable for 38.323. "secondaryRLC" is used for the other.
2. Slot level granularity is sufficient for *drx-onDuration* and *DRX-inactivity timer* and "slot offset". Values will include 32.
3. Separate values can be specified for UL and DL HARQ RTT. The values are numerology dependents and in number of symbols. Maximum number is 4ms as in LTE.

=> Rapporteur will create a list of parameters that still need discussions  
[CBF 537]

- |            |   |                 |            |        |
|------------|---|-----------------|------------|--------|
| R2-1713482 | Values of counters and timers for SR and BSR<br>NR_newRAT-Core      | Ericsson        | discussion | Rel-15 |
|            | => Not treated  |                 |            |        |
| R2-1713902 | Separate configurations for UL and DL PDCP SN lengths<br>R2-1711735 | HTC Corporation | discussion |        |
|            | => Not treated  |                 |            |        |

#### 10.4.1.3.3 Connection reconfiguration message - L1 parameters

*L1 parameter content of RRCConnectionReconfiguration message.*

*Including output from email discussion [99bis#19][NR] L1 parameters in RRC (Ericsson)*

*Any contributions should focus on critical issues NOT resolved by the email discussion and a supporting TP should be included in the contribution.*

*This agenda item is relevant to EN-DC completion.*

- |            |  |          |            |        |
|------------|--|----------|------------|--------|
| R2-1713430 | [99bis#19] Summary of NR L1 parameters in RRC<br>NR_newRAT-Core                | Ericsson | discussion | Rel-15 |
|            | P1   |          |            |        |
|            | - Intel would prefer to have 2 separate MIBs and avoid optionality in the MIB. |          |            |        |
|            | - Samsung ask if the MIB size would be the same in both cases.                 |          |            |        |
|            | - OPPO also prefer to have separate MIBs but to align with RAN1 agreements     |          |            |        |

#### **Agreements**

- 1 Create two different MIB encodings, one for sub-6 and one for mmWave (sub-6 encoding will require fewer bits).
  - 2 ssb-subcarrierOffset should be mandatory present and its value range should be from 0..11 (already captured in TP)
  - 3 Consider pdccchConfigSIB1 (in MIB) as mandatory field and define one code-point (e.g. all-zeros) as "SIB1 not present".
- => Inform RAN1 of MIB decisions (1 and 3). Can explain to RAN1 the reason to define this code point.
- 4 The NW may reconfigure BWPs in ServingCellConfigDedicated with or without synchronousReconfiguration (up to NW implementation).
  - 7 For initial access, the UE uses the information derived from MSI until the NW configures (if at all) one or more BWPs via RRC in ServingCellConfigDedicated.
- FFS Whether ServingCellConfigCommon should contain information (e.g. CORESET and/or (Common-)SearchSpace) similar that derived from MSI.
- FFS Whether to keep the SPS-Config including Type1 and Type2 or whether to split it into SPS-Config (Type2) and UplinkGrant-Config (Type1).

Update from offline discussion of MIB: RAN1 have concluded that the SSB index is now not in the MIB so the MIB is less frequency range dependent. Proposal is to revert agreement 1 and have a single MIB encoding.

- Samsung think there is still the subcarrier spacing which will be 2 bits. Ericsson suggest that the subcarrier spacing can still be a single bit but having different meaning depending on the frequency range.
  - Nokia wonder about extension in future that only apply for a single range
- => Offline discussion to conclude

=> Draft LS to RAN1 on code point meaning no RMSI in R2-1714184 (Offline discussion #41, Ericsson)

R2-1714184 Code point in MIB meaning no RMSI Ericsson LS out RAN1  
=> Approved in R2-1714205

- ☒ **[100#30][NR] L1 CSI meas config (Ericsson)**  
Progress details of L1 parameters  
Intended outcome: Report to next meeting  
Deadline: Thursday 2018-01-11

*BWP*

R2-1712889 Supporting BWP Operation in Stage-3 RRC MediaTek Inc. discussion

**Agreements**

- 1 Add a subclause for DL/UL BWP and BWP pair additional/modification is added in NR RRC spec.
- 2 Add a subclause for DL/UL BWP and BWP pair release is added in NR RRC spec.
- 3 For reconfiguration with synchronisation or for SCell addition, one DL/UL BWP indicated in the RRC message is the active BWP until it is changed by DCI.

R2-1712891 Supporting BWP Operation in Stage-3 RRC MediaTek Inc. discussion  
=> Revised to R2-1713942

R2-1713942 Supporting BWP Operation in Stage-3 RRC MediaTek Inc. discussion

R2-1713437 Cell specific parameter handling in EN-DC Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Noted

R2-1713868 Remaining issues on bandwidth part configuration Samsung discussion Rel-15

**Agreement**

- 1: BWP configuration for the SUL carrier is to be added.

*SUL*

R2-1713207 Stage 3 Procedure and parameters for supporting SUL Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core

**Agreements**

- 1: Common configuration and dedicated configuration for the UL and SUL can be independent. (Agreement is not meant to preclude any discussion in UP session)
- 2 Common configurations for both non-SUL and SUL can be provided to the UE
- 3 UE is configured with PUCCH and PUSCH dedicated configuration for either UL or SUL
- 4 UE can additionally be configured a PUSCH on the other carrier.
- 5 For reconfiguration with synchronisation, the UE can be provided with RACH dedicated configuration for either UL or SUL.

R2-1713356 TP on 38.331 for supporting SUL Huawei, HiSilicon pCR Rel-15 38.331 0.1.0  
NR\_newRAT-Core

R2-1713896 RRC configuration of SUL Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core  
=> Noted

*Other*

R2-1713858 RLM and RLF signalling structure for NR and TP for TS 38.331 Samsung R&D Institute UK  
discussion  
P1  
- MediaTek think this should be separate from RRM and hence in a separate location  
P6

- Samsung explain the value range is based on periodicity of SSB and the number of samples that are needed.

**Agreements**  
 1 RLM configuration and RLF related timers and constants are located as part of the SpCell configuration information (therefore a separate configuration from RRM)  
 FFS Value range for T310/T313

- R2-1712371 RB Alignment in NR Qualcomm Incorporated discussion Rel-15 NR\_newRAT  
*moved from 10.3.1.3.4 to 10.4.1.3.3*
- R2-1712287 Correction on NR-PBCH Definition for TS 38.331 OPPO discussion NR\_newRAT-Core  
 => revised to R2-1713951
- R2-1713951 Correction on NR-PBCH Definition for TS 38.331 OPPO discussion NR\_newRAT-Core  
*moved from 10.4.1.6.1 to 10.4.1.3.3*  
 => Noted
- R2-1713860 RLF signalling for BWP Samsung R&D Institute UK discussion  
 => Noted

*Withdrawn*

- R2-1713859 RLF signalling for BWP Samsung R&D Institute UK discussion Withdrawn

#### 10.4.1.3.4 Other (for EN-DCs)

*Stage 3 details related to SCG SRB, split SRB, etc.  
 Including output from email discussion [99bis#21][NR] RRC reconfiguration processing time for EN-DC (Ericsson)  
 This agenda item is relevant to EN-DC completion.*

*RRC processing times*

- R2-1713439 Summary of email discussion [99bis#21][NR] RRC reconfiguration processing time for EN-DC  
 Ericsson discussion Rel-15 NR\_newRAT-Core

**Agreements**

- 1 A joint processing time requirement is defined to LTE reconfiguration message with embedded NR RRC part.
- 2 The processing time requirement for NR RRC received over SRB3 is defined in 38.331.
- 3 The processing time requirements only apply to the case where the UE receives one RRC message at a time.
- 4 The processing time definition and unit of LTE RRC is applied also for LTE RRC with embedded NR RRC.
- 5 Following aspects should be considered when deciding RRC processing times for LTE RRCConnectionReconfiguration with embedded NR RRC:
  - LTE and NR ASN.1 decoding and encoding
  - Configuration time including coordination between LTE and NR part of UE
  - Encoding of LTE and NR complete message
  - Increased complexity due to introduction of new features and RRC IEs in LTE-A and NR
  - UE processing capability improvements since R8
- 6 The following two subcases are defined for RRCConnectionReconfiguration including NR RRC:
  - RRC connection re-configuration (NR measurement configuration)
  - RRC connection re-configuration (NR SCG establish/mod/release)

- R2-1713440 TP for 36.331 on RRC reconfiguration processing time for EN-DC Ericsson discussion  
 Rel-15 NR\_newRAT-Core  
 => Agreed
- R2-1713441 TP for 38.331 on RRC reconfiguration processing time for EN-DC Ericsson discussion  
 Rel-15 NR\_newRAT-Core  
 => Agreed
- R2-1712668 Processing delay requirement for EN-DC UE Intel Corporation discussion Rel-15 NR\_newRAT-Core

*Default configs*

- R2-1712414 Capturing of default configuration of SRB CATT discussion
- Samsung think this approach gives us the chance to switch back to a default and wonder if it is needed. CATT agree there is not really any need to switch back to default.
  - Ericsson think the choice structure is not need as there is no need to switch back and forth, and hence it will be possible to add a default configuration in future.
- => Offline discussion to conclude if and how to introduce default configurations for SRBs.  
(Offline discussion #34, CATT)
- Update from offline:
- R2-1714233 Offline discussion #34: Capturing of default configuration of SRB CATT discussion

**Agreements**  
1: Default configuration for SRB is used in NR. However the applicability of default configuration for SRB setup is captured in the procedure description only.

- R2-1713142 Default configuration of SRB1S, SRB2S and SRB3 Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core  
=> TP is agreed
- R2-1713392 Default configurations for SRB3 and split SRBs Ericsson discussion Rel-15  
NR\_newRAT-Core

*Other*

- R2-1712664 UE handling of combined configuration message Intel Corporation discussion Rel-15  
NR\_newRAT-Core

**Agreements**  
1: LTE reconfiguration message with embedded NR reconfiguration message is valid if the resultant configuration after processing both the LTE and NR reconfigurations is valid (i.e. the max capability is not exceeded in terms of band combination support, measurement capability and DRB support)  
2: RAN2 will not have a requirement that the NR and LTE parts of the reconfiguration need to be applied at exactly the same time, as long at each part is applied within the processing requirement.

- R2-1713399 Discussion and TP on preserving NR PDCP version Ericsson discussion Rel-15  
NR\_newRAT-Core
- OPPO think this should be discussed together with re-establishment. Samsung have the same view.
  - Ericsson think this case is different as an additional reconfiguration is not always needed but if we change to LTE PDCP then an extra reconfiguration step will be needed
  - Intel think this case has the same issue with legacy eNBs as the re-establishment.
  - LG think this requires that all cells in the resume area will have to support NE-DC and NR PDCP.
- => Can be discussed within the scope of offline discussion #22
- R2-1713438 PDCP version change for SRBs Ericsson discussion Rel-15 NR\_newRAT-Core
- Intel think the only case for change from NR to LTE PDCP is only performed in the case of handover to legacy eNB.

**Agreements**  
1 UEs configured with NR PDCP for SRB1 reverts back to LTE PDCP for SRB1 when they receive a "full configuration" RRC connection reconfiguration message which does not include any embedded NR RRC information.

- R2-1713442 TP for 38.331 on security algorithm configuration Ericsson discussion Rel-15  
NR\_newRAT-Core

**Agreements**

- 1 NR RRC should use the NR namespace (e.g. nia1, nea1) for configuring the security algorithms for all radio bearers configured with NR PDCP.
- 2 For EN-DC, the NR algorithm configured for bearers using NR PDCP and KeNB is restricted to algorithms which have an identical LTE algorithm and shall be the same as the algorithm configured for SRB1.

R2-1712763	Remaining issues on SRB3 => Noted	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1713487	Size of the C-RNTI <i>moved from 10.4.1.4.5 to 10.4.1.3.4</i>	Ericsson	discussion	Rel-15	NR_newRAT-Core

**Agreements**

The length of the C-RNTI field is 16 bits.

R2-1713497	DRAFT Reply LS on Supportable RNTI Length on DCI NR_newRAT-Core To:RAN1 <i>moved from 10.4.1.4.5 to 10.4.1.3.4</i> => Change RNTI to C-RNTI => Approved in R2-1714154	Ericsson	LS out	Rel-15	
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## 10.4.1.3.5 Connection control message harmonisation

*Harmonisation/merging of messages to be used for different procedures, UE identity and other message content to be used in different cases, etc.*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

*Maximum 1 tdoc per company*

R2-1713205	Harmonization of the RRC procedures 15 NR_newRAT-Core R2-1711486	Nokia, Nokia Shanghai Bell	discussion	Rel-	
R2-1713295	Harmonizing RRC Connection control messages and procedures Rel-15 NR_newRAT-Core	Ericsson	discussion		
R2-1712169	Further discussion on merging NR RRC messages NR_newRAT-Core	Samsung	discussion	Rel-15	
R2-1712411	RRC connection re-establishment and resume procedures in NR 1710279	CATT	discussion	R2-	
R2-1712579	Harmonization of RRC Connection Control management procedures discussion Rel-15 NR_newRAT-Core	Huawei, HiSilicon			
R2-1712672	NR common RRC procedures Core	Intel Corporation	discussion	Rel-15	NR_newRAT-
R2-1712796	Harmonization of Connection Control Procedures and Messages Rel-15 NR_newRAT-Core	InterDigital	discussion		
R2-1712986	NR RRC connection request 1711458	Sony	discussion	Rel-15	NR_newRAT-Core R2-
R2-1713553	Harmonization of the RRC connection management procedures discussion Rel-15 NR_newRAT-Core	NTT DOCOMO INC.			
R2-1713643	Simplification of RRC messages for NR NR_newRAT-Core R2-1711150	LG Electronics France	discussion	Rel-15	

## 10.4.1.3.6 Other (for non EN-DC)

*Other aspects of connection control procedures, state transitions, etc that are not relevant for EN-DC (other aspects relevant for EN-DC should be submitted to 10.4.1.3.2)*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712208	State transition from RRC_CONNECTED to RRC_INACTIVE Rel-15 NR_newRAT-Core R2-1711076	ASUSTeK	discussion		
R2-1712237	Discussion on Left Issues for RRC State Transitions	OPPO	discussion	R2-1710240	
R2-1712412	Open Issues on Connection Control Procedure	CATT	discussion	R2-1710280	



R2-1712413	Consideration on the relation between access categories and establishment causes discussion	R2-1710313			CATT
R2-1712566	Remaining issues on State transition between RRC CONNECTED and INACTIVE	HiSilicon discussion	Rel-15 NR_newRAT-Core		Huawei,
R2-1712567	Timer based state transmission from CONNECTED to inactive	discussion	Rel-15 NR_newRAT-Core		Huawei, HiSilicon
R2-1712580	UE behaviour upon leaving RRC_CONNECTED state			Huawei, HiSilicon	discussion
R2-1712582	RRC Establishment Cause	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	
R2-1712583	Consideration on RRC connection establishment procedure	discussion	Rel-15 NR_newRAT-Core		Huawei, HiSilicon
R2-1712584	Draft LS to RAN1 on MSG3 size	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core	
R2-1712764	Remaining FFS Issues on MSG3/4/5 Content for NR RRC Connection Control	discussion	Rel-15 NR_newRAT-Core	R2-1710934	vivo
R2-1712791	Open Issues on Connection Control Procedures	NR_newRAT-Core	InterDigital	discussion	Rel-15
R2-1712797	Timer-based Inactivation for NR	InterDigital	discussion	Rel-15 NR_newRAT-Core	
R2-1713206	RRC connection release and inactivation procedures	discussion	Rel-15 NR_newRAT-Core	R2-1711483	Nokia, Nokia Shanghai Bell
R2-1713275	Multiplexing NAS messages with MSG 3	Ericsson	discussion	Rel-15	
R2-1713279	Size of MSG3 in NR	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713280	Draft LS on MSG3 size	Ericsson	LS out	Rel-15 NR_newRAT-Core	To:RAN1
R2-1713300	Context fetch and paging relay via 5GC	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713303	Text proposal to 38.331 on RRC states	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713304	Text proposal to RRC connection control	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713389	NR re-establishment procedure	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713397	NR RRC procedure for inter-RAT handover	Ericsson	discussion	Rel-15 NR_newRAT-Core	
R2-1713635	Enhance RRC configuration procedure in NR	15 NR_newRAT-Core	Qualcomm Incorporated	discussion	Rel-
R2-1713693	Configurable cause for NR	Core R2-1711384	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1713778	L2 parameter update for RRC Activation and Inactivation	R2-1711797	Samsung Electronics	discussion	

#### 10.4.1.4 RRM measurements

*No documents should be submitted to 10.4.1.4. Please submit to 10.4.1.4.x.*

##### 10.4.1.4.1 RRM TP

*Including finalising details of measurement report content and measurement report configuration (separate AIs for these topics are not provided at this meeting).*

*This agenda item is relevant to EN-DC completion*

*Including output from email discussion [99bis#20][NR] RRM (Ericsson)*

*Any contributions should focus on critical issues NOT resolved by the email discussion and a supporting TP should be included in the contribution.*

R2-1713589	Summary of Email discussion #20: RRM TP	Ericsson	discussion	Rel-15
	NR_newRAT-Core => Revised in R2-1714128			
R2-1714128	Summary of Email discussion #20: RRM TP	Ericsson	discussion	Rel-15
	NR_newRAT-Core => Noted			

R2-1713590 TP on RRM Ericsson discussion Rel-15 NR\_newRAT-Core  
=> Noted

R2-1713598 Remaining issues of email discussion # 20 on measurement reporting Ericsson  
discussion Rel-15 NR\_newRAT-Core  
P1,2

- LG think UE should only report if SINR if there is an SINR measurement configured on that frequency. Huawei think we should align to the other quantities. Ericsson explain that for RSRQ and RSRQ then we always measure on serving cells.
- Vivo think we have not agreed that RSRQ is always measured on the serving cell. Intel is also not clear about RSRQ.
- Samsung think there is agreement that RSRP and RSRQ are always reported.
- Huawei think it would be strange to only report only if it is configured for the serving frequency. Also think that the network can always force the UE to make the measurement if it wants it.

Show of hands:

Approach A [6]

Proposal 1 UE shall perform SINR measurements, is possible, for each configured serving cell if it has at least one measId whose trigger quantity and/or report quantity includes SINR.

Proposal 2 UE shall report SINR measurements for each configured serving cell if the measID that has triggered the report has the SINR as one of the report quantity.

Approach B [10]

**Agreements**

- 1 UE shall report SINR measurements for each configured serving cell if SINR measurements are available (ie if the SINR measurements on serving cell are required according to a configured meas ID.)

=> Double check previous agreements related to serving cell reporting to determine if all cases are covered and captured in the spec. Identify anything that still needs to be concluded (Offline discussion #39, Samsung)

=> Offline discussion to conclude on reporting of RSType(s) and measurement quantities and beam level measurements for best neighbour cell reporting. (Offline discussion #40, Ericsson)

R2-1714188 Summary of offline#40 (neighbour cells on serving frequencies)

**Agreements**

- 1 Report available measurements of best neighbours on serving frequencies as in reportConfig (that triggered the report):
  - Include available beam measurement information if in reportConfig. If configured, same beam info is reported as in reportConfig (e.g. only indexes, same quantity(ies), same rsType, etc.)
  - Include the quantities indicated in reportConfig.
  - Include only available measurements associated to the same RS type indicated in reportConfig (e.g. if report config associated to the report has rsType set to SSB, report only SSB. If the report config associated to the report has rsType set to CSI-RS, report only CSI-RS).

R2-1714204 Offline discussion for serving cell measurement and reporting  
=> Revised in R2-1714206

R2-1714206 Offline discussion for serving cell measurement and reporting

**Agreements**

- 1-1: The UE shall perform RSRP, RSRQ measurements for each serving cell.

- 1-2: The UE shall report RSRP and RSRQ measurements of each serving cell if a measurement report is triggered, as in LTE.
- 2-1: The UE shall perform SINR measurements for each serving cell if SINR is configured in at least one of the meas ID(s).
- 2-2: The UE shall report SINR measurements of each serving cell if available and if a measurement report is triggered.
- 3-1: The UE shall perform L3 filtering of beams for beam measurements for each serving cell(s) if beam measurement reporting is configured in at least one of the measID(s).
- 3-2: The UE shall report beam measurements of each serving cell if available and if a measurement report is triggered.
- 4-2: The UE shall report serving cell measurement of the single RS Type, if available, which is configured in the ReportConfig which triggered the measurement report.

*MO content*

R2-1712887 Further Clarification on MO Configuration with/without SSB MediaTek Inc. discussion

P2

- Nokia think RAN4 have progressed on this discussion. The SSB can be located on or off the sync raster. AT+T clarify that if the SSB is for initial access then it will be on the sync raster but in other cases it may be off the raster.
- MediaTek think RAN4 has sync and channel raster and think the UE needs to know both rasters.

P5

- ATT think that RAN4 should decide the restriction whether this is just intra-band.
- Huawei think the MO already includes an SSB location and that can be used.

**Agreements:**

- 1 SSB subcarrier spacing is configured in the MO.
- 2 The SSB configuration used for timing reference is provided in the MO where only CSI-RS based RRM measurement is performed.

R2-1713199 What is serving frequency in NR? Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core

- Huawei thought the CD-SSB is just the one where the serving cell measurements are done. Nokia think this is not how RAN1 have defined. AT+T think it is mainly the one used for cell timing and serving cell measurements.
- Nokia assume that a cell can have multiple SSBs. Ericsson think that a single UE is configured with a single SSB that is using for timing, RLM, and measurements.
- Samsung agree with the Ericsson view.
- Ericsson explain there is a carrier frequency in the serving cell config common but it is not yet defined but assume it will have to point to the location of the CD-SSB.

**Agreements**

- 1 UE determines which MO corresponds to the serving cell frequency from the frequency location of the CD-SSB that is contained within the serving cell configuration.
- 2 More than one MO with CSI-RS resources for measurement can be associated to the same SSB location in frequency. The SSB is at least used for timing reference.
- 3 In case that more than one MO with CSI-RS resources for measurement is associated to the same SSB location in frequency the UE is indicated which MO corresponds to the serving carrier.

FFS whether the indication is in MO or serving cell configuration

R2-1712500 Remaining details of NR measurement report content and configuration AT&T discussion  
 R2-1713735 Remaining details for MO definition Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1712766 Remaining issues for measurement object vivo discussion Rel-15 NR\_newRAT-Core

R2-1712372 Synchronization Raster and Frequency Location Signalling in NR discussion Rel-15 NR\_newRAT Qualcomm Incorporated  
*moved from 10.3.1.3.4 to 10.4.1.4.1*

*Other*

R2-1712415 Considerations on neighbor cell reporting on serving frequencies CATT discussion R2-1710281

R2-1712647 s-Measure for NR-SS and CSI-RS in NR Intel Corporation discussion Rel-15 NR\_newRAT-Core  
 - Ericsson explain the assumption in the TP is that there is just one RS type provided for s-Measure at any point in time.  
 - Nokia think the current approach in the TP is sufficient. LG have the same view and the problems in the documents cannot happen if the network configures correctly. Sony also have the same view. IDC think that one is sufficient as the trigger to just start measuring.  
 - OPPO think that one is sufficient.  
 - ZTE support the proposal.  
 => The approach in the current TP is confirmed (i.e. s-Measure controls all measurements, irrespective of whether s-Measure is configure as CSI-RS or SSB threshold)

**Agreements**

Proposal 3: The UE is not required to perform measurement configured by MN when s-Measure configured by MN satisfied, except for NR (i.e. NR measurements are not controlled by s-Measure). Similarly, the UE is not required to perform measurements configured by SN when s-Measure configured by SN is satisfied.

R2-1713427 Corrections on RRM TP Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
 R2-1713591 Parameters for cell quality derivation Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1713592 Measurement object addition/ modification Ericsson discussion Rel-15 NR\_newRAT-Core

*New*

R2-1714127 Measurement related actions upon handover and re-establishment Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1714139 s-Measure configuration and UE behavior Ericsson discussion Rel-15 NR\_newRAT-Core  
 R2-1714150 Explicit indication for only beam ID reporting Ericsson discussion Rel-15 NR\_newRAT-Core

10.4.1.4.2 L3 filter configuration

*Including output from email discussion [99bis#22][NR] Filter coefficients (MediaTek)  
 This agenda item is relevant to EN-DC completion  
 Maximum 1 tdoc per company*

R2-1713673 Report of Email Discussion 99bis#22 NR Filter Coefficients MediaTek Inc. report

**Agreements**

1 Different filter coefficients can be configured for different measurement quantities, for different RS types, and for cell and beam measurements.

*Different filter configurations*

R2-1712789 Remaining issues with RRM measurements InterDigital discussion Rel-15 NR\_newRAT-Core  
 R2-1713674 NR Filter coefficients for different frequencies MediaTek Inc. discussion  
 R2-1713263 On the need of multiple filter coefficients in NR Rel-15 NR\_newRAT-Core discussion  
 - Discussed jointly with previous two papers

**Agreements**

- 1 Different MOs can operate with different filter coefficients
- 2 Up to 2 filter coefficient sets are configured within the measConfig
- 3 Add a reference in the MO to the filter coefficient configuration that is to be used

R2-1712550 ASN.1 structure for L3 filter configuration Huawei, HiSilicon discussion Rel-15  
 R2-1714034 L3 filtering configuration Ericsson discussion Rel-15 NR\_newRAT-Core

*Others*

R2-1712648 Remaining issues on measurement reporting for beam and cell Intel Corporation  
 discussion Rel-15 NR\_newRAT-Core  
 R2-1712649 Draft : LS on minimum requirement on total number of beam measure in NR Intel  
 Corporation discussion Rel-15 NR\_newRAT-Core  
 R2-1713675 NR Beam Measurements and UE Complexity MediaTek Inc. discussion  
*moved from 10.4.1.4.5 to 10.4.1.4.2*  
 R2-1713677 Draft LS on NR Beam Measurements MediaTek Inc. LS out To:RAN4  
*moved from 10.4.1.4.5 to 10.4.1.4.2*  
 R2-1713596 Triggering of L3 filtered beam measurements Ericsson discussion Rel-15  
 NR\_newRAT-Core  
*moved from 10.4.1.4.5 to 10.4.1.4.2*

10.4.1.4.3 Measurement events

*Any additional aspects of measurement events. Potential support for Cx events will be discussed when input has been received from RAN1 on beam management  
 This agenda item is relevant to EN-DC completion*

*Cx events*

R2-1713736 Layer 3 mobility based on CSI-RS events Ericsson discussion Rel-15 NR\_newRAT-  
 Core  
 => Cx events will not be included in the Dec 17 spec.

R2-1713887 Discussion on C1/C2 events Qualcomm Incorporated discussion Rel-15 NR\_newRAT-  
 Core R2-1711347

R2-1712416 Further considerations on events C1 and C2 CATT discussion R2-1710282

R2-1712519 On the need for Cx events Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

R2-1712606 Discussion on the introduction of SS-block specific events ZTE Corporation, Sane Chips  
 discussion Rel-15 R2-1710432

R2-1712790 Measurement configuration with Ax and Cx events InterDigital discussion Rel-15  
 NR\_newRAT-Core R2-1710672

R2-1713415 Details of events A1-A6 and need for C1-C2 events in NR Nokia, Nokia Shanghai Bell  
 discussion Rel-15 NR\_newRAT-Core

*Other*

R2-1713599 Triggering condition for A1-A6 events in NR Ericsson discussion Rel-15  
 NR\_newRAT-Core

R2-1712798 Measurement Events to Support BWPs InterDigital discussion Rel-15 NR\_newRAT-  
 Core  
*moved from 10.3.1.4.3 to 10.4.1.4.3*

10.4.1.4.4 Measurement gaps

*For initial discussion in RAN2 but may be difficult to progress without input from RAN4.  
 This agenda item is relevant to EN-DC completion*

R2-1712650 Measurement gap in NR Intel Corporation discussion Rel-15 NR\_newRAT-Core

**Agreements:**

- 1 For case of a single gap pattern that applies to both LTE and NR radios of the UE ('per UE gaps'): LTE RRC provides a single measurement gap configuration.

- 2 For the independent gap case where UE is able to apply a different gap pattern for LTE/FR1 and FR2:
  - a/ NR RRC configures a measurement gap configuration for FR2.
  - b/ LTE RRC configures a measurement gap configuration for LTE and NR FR1 frequencies

R2-1713426 Measurement gap configuration in EN-DC Ericsson Inc. discussion Rel-15

- Agreements:**
- 1 In the case of per UE measurement gap configuration, MN decides the configuration and informs the SN about the configuration.
  - 2 For Dec 17, adopt a solution where:
    - a/ For case of a single gap case the network always configures per UE gaps if the UE is configured to measure any inter-freq or inter-RAT carrier or intra-freq cases where gaps are required.
    - b/ For the independent gap case the network always configures for the LTE/FR1 gaps if the UE is configured to measure any carrier within the FR1 range, and network always configures for the FR2 gaps if the UE is configured to measure any carrier within the FR2 range.
  - 3 For the independent gap case once EN-DC is setup:
    - a/ the MN should inform the measurement gap pattern configuration on FR1 to the SN
    - b/ the MN should inform the SN that it wants to measure in FR2 frequency(ies). Some assistance information to the SN to configure the gaps is provided
    - c/ the SN should inform the MN that it wants to measure in NR carriers in FR1 range, if the SN has not already received a measurement gap pattern. Some assistance information to the MN to configure the gaps is provided

FFS What assistance information is required
  - 4 For the per UE gap case once EN-DC is setup:
    - a/ the MN should inform the measurement gap pattern configuration to the SN
    - b/ the SN should inform the MN that it wants to measure any inter-freq carrier or intra-freq cases where gaps are required. Some assistance information to the MN to configure the gaps is provided
  - 5 Capability is added to indicate support for independent gap configuration for FR1 and FR2

R2-1712366 Measurement capability and measurement gap handling in EN-DC Qualcomm Incorporated  
discussion Rel-15 NR\_newRAT  
=> Noted

R2-1712693 Measurement Gap Capability Signaling aspects for EN-DC and NR SA Intel Corporation  
discussion Rel-15 NR\_newRAT-Core

R2-1713739 Discussion on AllowInterruption in NR and EN-DC Ericsson discussion Rel-15  
NR\_newRAT-Core

R2-1713740 Draft LS to RAN4 on need of allowInterruption Ericsson discussion Rel-15  
NR\_newRAT-Core

R2-1713200 Measurement configuration and measurement gaps Nokia, Nokia Shanghai Bell  
discussion Rel-15 NR\_newRAT-Core

R2-1712243 NR Measurement Gap Configurations OPPO discussion

R2-1712270 Considerations for measurement GAP for NR in EN DC Spreadtrum Communications  
discussion Rel-15 R2-1710373

R2-1712274 Sliding measurement GAP Spreadtrum Communications discussion Rel-15 R2-1710375

R2-1712551 Measurement gap configuration in NR Huawei, HiSilicon discussion Rel-15

R2-1712569 Definition of GAP assisted measurement in NR Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core

R2-1712602 Discussion on the configuration of measurement gap ZTE Corporation, Sane Chips  
discussion Rel-15

R2-1712765	Issues on measurement gap in EN-DC and NR Core	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1712886	Measurement Gap Design for EN-DC Core	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1712888	Measurement Gap Design for NR SA Core	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1713555	Measurement Gap for MR-DC Core	NTT DOCOMO INC.	discussion	Rel-15	NR_newRAT-Core
R2-1713737	Configuration of measurement gap in NR Core	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713821	Measurement gap considering beam NR_newRAT-Core R2-1709131	LG Electronics Inc.	discussion	Rel-15	
R2-1713918	Measurement Gap Configuration for EN-DC	Samsung	discussion		

#### 10.4.1.4.5 Other (for EN-DC)

*Other RRM related aspects that are relevant to EN-DC  
This agenda item is relevant to EN-DC completion*

R2-1713869	RRM measurement to support bandwidth parts in NR	Samsung	discussion	Rel-15	
R2-1712560	BWP impact on RRM measurement NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15	
R2-1712417	Handling of Measurement Configured by SN upon SN/PSCell change	CATT	discussion		
R2-1712240	Discussion on Remaining Issues for RRM Configuration => revised to R2-1713947	OPPO	discussion		
R2-1713947	Discussion on Remaining Issues for RRM Configuration	OPPO	discussion		
R2-1712241	Discussion on Remaining Issues for RRM Reporting	OPPO	discussion		
R2-1712273	Measurement requirement issue due to different DRX configurations Communications discussion Rel-15 R2-1710378	Spreadtrum			
R2-1712549	Remaining issues on measurement configuration	Huawei, HiSilicon	discussion	Rel-15	
R2-1712581	Cell quality adjustment	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713400	Measurement configurations and signaling for fast setup NR_newRAT-Core	Ericsson	discussion	Rel-15	
R2-1713593	Mobility states and speed based parameter scaling in NR NR_newRAT-Core	Ericsson	discussion	Rel-15	
R2-1713600	Impact of cell quality scaling in NREricsson		discussion	Rel-15	NR_newRAT-Core
R2-1713720	Details of CSI-RS configuration in MO NR_newRAT-Core	LG Electronics Inc.	discussion	Rel-15	
R2-1713741	Measurement priority handling in NR Core	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713819	ANR for NR 1709128	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1713870	RAN2 impact of non-contiguous CA	Samsung	discussion	Rel-15	

#### 10.4.1.4.6 Inter-RAT measurements

*Inter-RAT E-UTRA measurements for the purpose of inter-RAT handover from NR to E-UTRA  
This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712568	Remaining issue on Events and measurements for handover from NR to E-UTRA	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1712607	Inter-RAT measurements for NR handover to EUTRAN	ZTE Corporation, Sane Chips	discussion	Rel-15	R2-1710437

#### 10.4.1.4.7 Other (for non EN-DC)

*Other RRM related aspects that are not relevant for EN-DC  
This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712571	Speed dependent mobility for connected mode NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15	
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R2-1713601	Alternative Time To Trigger in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713602	Support SSTD measurement configuration via NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713603	UE behavior upon CGI reporting	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713842	Beam Refinement Considering RRM Measurement based on NR-SS				Samsung Electronics
	discussion	R2-1711602			
R2-1713844	Discussion on Speed-dependent Scaling of Measurement-related Parameters and Mobility History Reporting in NR	Samsung Electronics	discussion	R2-1711603	
R2-1713845	Scenarios of Measurement Gap Considering Bandwidth Part				Samsung Electronics
	discussion	R2-1711607			
R2-1713846	The Impact of Beam Sweeping on RRM Measurement	Samsung Electronics	discussion		
		R2-1711606			
R2-1713849	Discussion on the Use of Alternative TTT in NR	Samsung Electronics	discussion		
R2-1713871	RRM measurement for multiple numerologies in NR	Samsung	discussion	Rel-15	
R2-1713872	RRM considerations for adaptive bandwidth in NR	Samsung	discussion	Rel-15	
R2-1713916	NR CSI-RS Configuration for RRM Measurement	Samsung Electronics	discussion		

#### 10.4.1.5 Mobility

No documents should be submitted to 10.4.1.5. Please submit to 10.4.1.5.x.

##### 10.4.1.5.1 Beam selection for HO access

*This agenda item is relevant to EN-DC completion.*

*Including output from email discussion [99bis#23][NR] TP on beam selection (Ericsson)*

*Maximum 1 tdoc per company*

R2-1712347	Report of email discussion [99bis#23]: MAC text proposal on beam selection	Ericsson	discussion	NR_newRAT-Core
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Show of hands

- 1 Need additional ssb-CommonRACHThreshold to be used in the case of CBRA for handover [4]
- 2 No need for additional ssb-CommonRACHThreshold to be used in the case of CBRA for handover (ssb-dedicatedRACH-Threshold reused for CBRA as well) [11]

#### Agreements

- 1 ssb-Threshold signalled in handover command (for both common and dedicated RACH)
- 2 csirs-dedicatedRACH-Threshold signalled in handover command

=> TP option 1 from the document can be merged into the draft TS, together with the agreements above.

R2-1713171	Remaining issues on beam selection during handover	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1712997	Clarification on the measurement used for the beam selection	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1712507	Further discussion on beam selection during handover	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713909	Beam selection enhancement for RACH based HO in NR	OPPO	discussion		

*Late*

R2-1713604	Further details of handover execution in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
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##### 10.4.1.5.2 SCG change for EN-DC

*Stage 3 details of SCG change for EN-DC.*

*This agenda item is relevant to EN-DC completion.*

R2-1712440	UE processing upon inter-MN handover with SN change	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1713899	SCG change failure in EN-DC	Qualcomm Europe Incorporated	discussion	Rel-15	



### 10.4.1.5.3 SCG failure for EN-DC

*Stage 3 details for SCF failure for EN-DC, including both the NR and LTE aspects of the procedure. This agenda item is relevant to EN-DC completion.*

*SCG failure with split SRB/DRB*

R2-1713640	UL path switch upon SCG failure	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1712867	SCG Failure and Split SRB	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1712767	Remaining issues on SCG failure	vivo	discussion	Rel-15	NR_newRAT-Core R2-1710931
R2-1713393	Discussion and TP on remaining issues on SCG Failure	Ericsson	discussion	Rel-15	NR_newRAT-Core

*Other*

R2-1712892	TP for RLF Timers & Constants configuration in 38.331	MediaTek Inc.	discussion		
R2-1713346	Remaining open issues for RRC timers in EN-DC	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713143	Handling upon joint configuration failure	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713394	Discussion and TP regarding resuming radio bearers and SCG transmission after SCG failure	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1713923	Remaining Issues for SCG Failure	Samsung	discussion		
R2-1713139	TP on 38.331 to support UP IP check failure handling	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713395	Scell-RLF discussion	Ericsson	discussion	Rel-15	NR_newRAT-Core

*Withdrawn*

R2-1713919	Remaining Issues for SCG Failure	Samsung	discussion	Withdrawn	
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### 10.4.1.6 System information

*No documents should be submitted to 10.4.1.6. Please submit to 10.4.1.6.x.*

#### 10.4.1.6.1 MIB content

*Any further details of the MIB content required for EN-DC operation.*

*This agenda item is relevant to EN-DC completion*

*Needed for EN-DC*

R2-1712418	SI info transmission on f1 interface	CATT	discussion		
R2-1712492	Transmission time interval for NR-MIB and NR-SIB1	Ericsson	discussion		NR_newRAT-Core

*Other*

R2-1713281	Discussion on barring indication in NR-MIB	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1712225	Discussion on CellBarred Info in NR MIB and SIB1	OPPO, Coolpad	discussion	Rel-15	NR_newRAT-Core
R2-1712598	Remaining issues on NR-PBCH	ZTE Corporation, Sane Chips	discussion	Rel-15	
R2-1712971	Single cellBarred IE in NR System Information	vivo, Qualcomm Incorporated, Xiaomi, CATR, China Telecom, China Unicom	discussion	Rel-15	NR_newRAT-Core
R2-1713282	Discussion on maximum idle mode DRX value in NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core R2-1710455
R2-1713552	Duration of the Barring Timer	Nokia, Nokia Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1713283	[DRAFT] Reply LS on maximum idle mode DRX value	Huawei, HiSilicon		LS out	Rel-15 NR_newRAT-Core R2-1710456 To:SA2

#### 10.4.1.6.2 System information content/structure

*Progress details of the content and structure of system information (excluding MIB content covered in AI 10.4.1.5.2)*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

R2-1712229	Initial considerations on Content of Other SI for NR	OPPO	discussion	Rel-15	NR_newRAT-Core R2-1710180
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R2-1712483	System information structure and contents	Ericsson	discussion	NR_newRAT-Core
R2-1712484	SS Block index dependent system information	Ericsson	discussion	NR_newRAT-Core
R2-1712489	SIBs needed for stand-alone NR deployments	Ericsson	discussion	NR_newRAT-Core R2-1710389
R2-1712491	System information content at network sharing	Ericsson	discussion	NR_newRAT-Core
R2-1712599	Consideration on the Content of NR-RMSI	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1712984	Optional configuration in NR system information	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713284	Detailed design of the contents of System Information	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1713433	Some SIB1 contents and clean-up of Section 7.3 in Stage-2		discussion	Samsung R&D Institute India
R2-1713636	Organization of NR System Information	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core

#### 10.4.1.6.3 Stored system information

*Further details of stored SI including index/identifier format*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows.*

*Maximum 1 tdoc per company*

R2-1712244	Area ID and details on value tag message structure for NR	Gemalto N.V.	discussion	R2-1710139
R2-1712409	Considerations for the SI index design	PANASONIC R&D Center Germany	discussion	Rel-15
R2-1712419	Indexed SI in NR	CATT	discussion	R2-1710285
R2-1712485	Stored System Information	Ericsson	discussion	NR_newRAT-Core
R2-1712600	Consideration on the Stored other SI	ZTE Corporation, Sane Chips	discussion	Rel-15 R2-1710418
R2-1712768	Stored system information in NR	vivo	discussion	Rel-15 NR_newRAT-Core R2-1710939
R2-1712799	Details of Stored System Information for NR	InterDigital	discussion	Rel-15 NR_newRAT-Core R2-1710673
R2-1712819	The index of stored system information	Fujitsu	discussion	Rel-15 NR_newRAT-Core Withdrawn
R2-1712825	The index of stored system information	Fujitsu	discussion	Rel-15 NR_newRAT-Core R2-1710361
R2-1713073	On structure of SI index	MediaTek Inc.	discussion	
R2-1713285	Area ID and value tag for SIBs	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1710460
R2-1713444	Index based approach and Stored SI	Samsung R&D Institute India	discussion	R2-1711752
R2-1713556	Signalling of System Information Area	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core
R2-1713637	NR SI area ID and value tag	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1713726	SI valid area configuration	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1710814

#### 10.4.1.6.4 System information modification

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

*Maximum 1 tdoc per company*

R2-1712227	Discussion on NR SI Modification	OPPO	discussion	Rel-15 NR_newRAT-Core R2-1710181
R2-1712420	SI Modification	CATT	discussion	R2-1710286
R2-1712486	Change of System information in NR	Ericsson	discussion	NR_newRAT-Core
R2-1712769	SI Change Notification	vivo	discussion	Rel-15 NR_newRAT-Core R2-1710940
R2-1712800	SI Modification Procedure in NR	InterDigital	discussion	Rel-15 NR_newRAT-Core R2-1710674

R2-1713074	NR SI Modification	MediaTek Inc.	discussion		
R2-1713286	SI Update procedure R2-1710461	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1713375	System Information Update in NR NR_newRAT-Core	Samsung R&D Institute India R2-1707676	discussion	Rel-15	
R2-1713557	System Information Modification in NR NR_newRAT-Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15	
R2-1713570	Discussion on the granularity of SI change notification Core R2-1711767	ITRI	discussion	NR_newRAT-	
R2-1713698	System information modification Core R2-1711390	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-
R2-1713861	SI modification for Stored SI	ITL	discussion	Rel-15	R2-1711566

#### 10.4.1.6.5 System information scheduling

*This agenda item is not relevant to EN-DC completion and but will be treated if time allows*

*Maximum 1 tdoc per company*

R2-1712230	Consideration on NR SI Scheduling R2-1710179	OPPO	discussion	Rel-15	NR_newRAT-Core
R2-1712487	System Information Scheduling 1710387	Ericsson	discussion	NR_newRAT-Core	R2-
R2-1712770	Scheduling of Other SI	vivo	discussion	Rel-15	NR_newRAT-Core R2-1710941
R2-1713287	Considerations on System Information scheduling NR_newRAT-Core R2-1710462	Huawei, HiSilicon	discussion	Rel-15	
R2-1713373	SI Message TX/RX in NR Core R2-1707677	Samsung R&D Institute India	discussion	Rel-15	NR_newRAT-
R2-1713554	Indication for On-Demand SI Broadcast NR_newRAT-Core	Nokia, Nokia Shanghai Bell	discussion	Rel-15	
R2-1713577	Details of Other SI scheduling information R2-1711089	ETRI	discussion	Rel-15	NR_newRAT-Core
R2-1713704	System information scheduling Core R2-1711391	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-

#### 10.4.1.6.6 On demand system information

*Including need for additional bit to indicate if SI message is actually being broadcast*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712214	Discussion on On-demand system information request in NR Rel-15 NR_newRAT-Core			ASUSTeK	discussion
R2-1712228	Discussion on Remaining Issues of On-Demand SI NR_newRAT-Core R2-1710178		OPPO	discussion	Rel-15
R2-1712307	On demand system information	SHARP Corporation	discussion	R2-1710250	
R2-1712421	Remaining issues of on-demand SI	CATT	discussion	R2-1707905	
R2-1712488	Open issues on On-demand SI 1710388	Ericsson	discussion	NR_newRAT-Core	R2-
R2-1712496	On-demand SI reject procedure	Ericsson	discussion	NR_newRAT-Core	
R2-1712498	On-demand SI in RRC connected	Ericsson	discussion	NR_newRAT-Core	
R2-1712499	Duration of on-demand SI broadcast	Ericsson	discussion	NR_newRAT-Core	
R2-1712771	Remaining issues of on demand SI R2-1710942	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1712801	On Demand SI Request Procedure Core R2-1710676	InterDigital	discussion	Rel-15	NR_newRAT-
R2-1712968	Msg4 content for SI request	Potevio	discussion	Rel-15	
R2-1712988	Necessity of indication that on demand SI is being broadcast NR_newRAT-Core			Sony	discussion Rel-
R2-1713075	Indicator for Other SI Transmission	MediaTek Inc.	discussion		
R2-1713288	On demand SI acquisition and failure handling NR_newRAT-Core R2-1710463	Huawei, HiSilicon	discussion	Rel-15	
R2-1713369	On Demand SI: Remaining Issues	Samsung R&D Institute India	discussion		
R2-1713571	Discussion on the additional indication for on-demand SI Core R2-1711768	ITRI	discussion	NR_newRAT-	

R2-1713579	Other SI broadcast indication mechanism	ETRI	discussion	Rel-15	NR_newRAT-Core R2-1707946
R2-1713638	Open issues on NR on-demand SI	Qualcomm	Incorporated discussion	Rel-15	NR_newRAT-Core
R2-1713697	Remaining issues on on-demand SI request procedure	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core R2-1711389
R2-1713723	Other-SI request and acquisition in CONNECTED	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core R2-1710812

#### 10.4.1.6.7 System information -other

##### *Other system information related aspects*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting*

R2-1712490	Dedicated System Information	Ericsson	discussion	NR_newRAT-Core
R2-1712493	NR-SIB1 content for NSA and ANR	Ericsson	discussion	NR_newRAT-Core
R2-1712494	Defining reserved resources in NR-SIB1	Ericsson	discussion	NR_newRAT-Core
R2-1712495	Open issues on cell barring	Ericsson	discussion	NR_newRAT-Core
R2-1712497	Update of SI Area common SI	Ericsson	discussion	NR_newRAT-Core
R2-1712839	On supporting multiple modification periods in NR	Samsung	discussion	NR_newRAT-Core
R2-1713289	Public Warning system for NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1710465
R2-1713374	SI Reception in RRC Connected: Bandwidth Part Aspects	Samsung R&D Institute India	discussion	
R2-1713705	UE dedicated on-demand SI delivery in NR	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1711392
R2-1713912	UE capability for increased number of carrier monitoring	Ericsson	discussion	NR_newRAT-Core
R2-1713913	Measurement Requirements for Deactivated Secondary Component Carriers	Ericsson	discussion	NR_newRAT-Core
R2-1713914	Mobility Enhancements in NR	Ericsson	discussion	NR_newRAT-Core
R2-1713915	LocationInfo reporting	Ericsson	discussion	NR_newRAT-Core

#### 10.4.1.7 Inactive state

*No documents should be submitted to 10.4.1.6. Please submit to 10.4.1.6.x.*

##### 10.4.1.7.1 RAN area configuration

*Any further details of RAN area configuration given LS response to RAN3 from RAN2#99bis.*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Maximum 1 tdoc per company*

R2-1712670	TP on RAN notification area configuration	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1712193	Further considerations on RAN paging area for NR	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1712252	Discussion on Assistance Information for RAN-based Notification Area Decision		discussion	OPPO	
R2-1712576	RAN-based notification area configuration	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

*Late*

R2-1712614	Consideration on RAN area configuration	ZTE Corporation, Sane Chips	discussion	Rel-15	R2-1710428
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##### 10.4.1.7.2 RAN area update procedure

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

*Maximum 1 tdoc per company*

R2-1712194	RRC procedures for the RAN paging area	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1712423	RAN-based notification area update procedure	CATT	discussion	R2-1711760	

- R2-1712572 Discussion on CN location Update and RNA Update for inactive state Huawei, HiSilicon  
discussion Rel-15 NR\_newRAT-Core
- R2-1712615 Consideration on periodic RAN area update procedure ZTE Corporation, Sane Chips  
discussion Rel-15 R2-1710429
- R2-1712802 RAN Location Area Update Procedure for NR InterDigital discussion Rel-15  
NR\_newRAT-Core
- R2-1713296 RAN area update in RRC\_INACTIVE Ericsson discussion Rel-15 NR\_newRAT-  
Core
- R2-1713631 Timer handling of RAN-based location area update LG Electronics France discussion  
Rel-15 NR\_newRAT-Core R2-1711149
- R2-1713744 Discussion on RAN-based location area update procedure in NR ASTRI, TCL Communication  
Ltd. discussion

*Withdrawn*

- R2-1712960 Discussion on RAN notification area update Lenovo, Motorola Mobility discussion  
Rel-15 NR\_newRAT-Core R2-1711373

10.4.1.7.3 Paging in inactive

*RRC procedure to respond to paging, including any differences between RAN and CN paging  
This agenda item is not relevant to EN-DC completion but will be treated if time allows*

- R2-1712422 Procedure of paging in inactive CATT discussion R2-1710288
- R2-1712671 RAN-initiated paging message Intel Corporation discussion Rel-15 NR\_newRAT-  
Core
- R2-1712195 Further considerations on the CN and RAN paging Samsung discussion Rel-15  
NR\_newRAT-Core
- R2-1712520 Paging in RRC\_INACTIVE Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1711366
- R2-1713618 CN-initiated paging for a UE in RRC\_INACTIVE LG Electronics Inc. discussion Rel-  
15 NR\_newRAT-Core R2-1711126
- R2-1713703 RAN paging DRX in RRC\_INACTIVE LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1711393

*Late*

- R2-1713932 RAN initiated paging Huawei, HiSilicon discussion

10.4.1.7.4 Inter-RAT mobility between NR Inactive and E-UTRA/5GC Inactive

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

- R2-1712196 Inter-RAT mobility in the RRC INACTIVE state Samsung discussion Rel-15  
NR\_newRAT-Core
- R2-1712197 Text proposal for UE inter-RAT re-selection in INACTIVE Samsung, Nokia, Nokia Shanghai Bell  
pCR Rel-15 38.300 1.1.1 NR\_newRAT-Core
- R2-1712346 Additional SIB in EUTRAN for supporting NR SA deployments Ericsson discussion
- R2-1712573 Inter-RAT mobility for inactive UE Huawei, HiSilicon discussion Rel-15 NR\_newRAT-  
Core
- R2-1713260 Inter-RAT mobility between NR and eLTE for Inactive state LG Electronics Inc. discussion  
Rel-15 NR\_newRAT-Core
- R2-1713307 Mobility between LTE and NR for inactive Ues Ericsson discussion Rel-15  
NR\_newRAT-Core
- R2-1713308 UE context handling during inter RAT handover Ericsson discussion Rel-15  
NR\_newRAT-Core

10.4.1.7.5 Security framework for inactive

*Security framework for inactive UEs to address FFS arising from email discussion 98#30.  
This agenda item is not relevant to EN-DC completion but will be treated if time allows*

- R2-1712772 Security aspects in RRC INACTIVE vivo discussion Rel-15 NR\_newRAT-Core  
R2-1710944

R2-1713651	Consideration on security aspect for inactive UEs	LG Electronics France	discussion	Rel-15
R2-1712673	NR security framework for inactive Intel Corporation		discussion	Rel-15 NR_newRAT-Core
R2-1712564	Security of INACTIVE to CONNECTED state transition	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712424	Security issues related to RRC resume procedure from inactive state	CATT	discussion	
R2-1712565	Draft LS to SA3 on inactive to connected state transition	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712792	Security Aspects of Connection Control	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1713202	Security in inactive state	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core R2-1711056
R2-1713445	Security procedure from RRC_INACTIVE state in NR	Samsung R&D Institute India	discussion	R2-1711771
R2-1713446	[DRAFT] LS on security framework for INACTIVE in NR out	Samsung R&D Institute India	LS To:SA3	Rel-15 NR_newRAT-Core R2-1711796

#### 10.4.1.7.6 Inactive - other

##### *Other inactive state related aspects*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712209	UE actions upon cell reselection in RRC_INACTIVE	ASUSTeK	discussion	Rel-15 NR_newRAT-Core R2-1711079
R2-1712253	Discussion on cell reselection priority for INACTIVE UE	OPPO	discussion	
R2-1712254	Discussion on Cached Data Handling for INACTIVE UE	OPPO	discussion	
R2-1712552	RLAU procedure and interaction with TAU	Huawei, HiSilicon	discussion	Rel-15 R2-1710545
R2-1712574	RRC state transition from INACTIVE to IDLE	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712575	Cell reselection for inactive UEs	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712577	Support of redistribution priority in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712674	TP on agreed NR inactive aspects	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1712682	Cell reselection for inactive Ues	Intel Corporation	discussion	Rel-15 NR_newRAT-Core R2-1710627
R2-1712773	RRC Connection Release Issues for UE in RRC_INACTIVE	vivo	discussion	Rel-15 NR_newRAT-Core
R2-1712978	Data transmission in Inactive	TCL Communication Ltd.	discussion	Rel-15 NR_newRAT-Core
R2-1713201	Consistent support of RRC_INACTIVE	Nokia, Nokia Shanghai Bell	discussion	Rel-15 NR_newRAT-Core R2-1711055
R2-1713274	Coordination of I-RNTI/Resume ID's across RAT's	Ericsson	discussion	Rel-15 LTE_5GCN_connect-Core
R2-1713297	CN area updating in RRC_INACTIVE	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713298	I-RNTI discussion	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713299	Context relocation in NR Release 15	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1713448	PLMN Selection in RRC INACTIVE state	Samsung R&D Institute India	discussion	R2-1711818
R2-1713572	Cell reselection for inactive UE	ITRI	discussion	NR_newRAT-Core
R2-1713614	Further consideration on INACTIVE feature	LG Electronics France	discussion	NR_newRAT-Core
R2-1713616	Consideration on MICO mode for RRC_INACTIVE	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1711124
R2-1713617	Support for PLMN selection in RRC_INACTIVE	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1711125

R2-1713619 Offloading UEs in RRC\_INACTIVE LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1711143

R2-1713700 Handling of radio bearers and security for data transmission in RRC\_INACTIVE LG  
Electronics Inc. discussion Rel-15 NR\_newRAT-Core R2-1711395

*Late*

R2-1713935 On the optionality of the INACTIVE state" Samsung discussion Rel-15, NR\_newRAT-  
Core

#### 10.4.1.8 Access control

*Continue to progress unified access control*

*This agenda item is not relevant to EN-DC completion but will be treated if time allows*

*Including output from email discussion [99bis#24][NR] AC (Intel)*

*Email discussion*

R2-1712654 Email discussion report on [99bis#24][NR] AC Intel Corporation (rapporteur) report Rel-  
15 NR\_newRAT-Core  
=> Noted

R2-1712655 Draft Reply LS on unified Access Control for 5G NR (R2-1710062/S1-173552) from SA1 Intel  
Corporation discussion Rel-15 NR\_newRAT-Core

- LG wonder if we can also respond to CT1 about their question 9.
- Qualcomm think we should ask whether NAS does the mapping and how to treat NAS PDU with data. Intel think many other questions were proposed so we should now just send those for which there is agreement.

=> Approved in R2-1714013

R2-1714013 Reply LS on unified Access Control for 5G NR RAN2 LS out Rel-15 NR\_newRAT-Core  
To:SA1 Cc:CT1, SA2, CT6

*Other*

R2-1712176 QoS Flow based Access Control for CONNECTED Mode in NR TCL discussion  
NR\_newRAT-Core R2-1710170

R2-1712221 Discussion on Access Control for On-demand SI Request OPPO discussion Rel-15

R2-1712224 Discussion on RRC Layer Enhancement for NR Access Control OPPO discussion Rel-  
15 NR\_newRAT-Core

R2-1712268 Timer mechanism for 5G unified access cotnrol Spreadtrum Communications discussion  
Rel-15

R2-1712269 Barring information encoding for 5G unified access cotnrol Spreadtrum Communications  
discussion Rel-15

R2-1712351 Access attempt categorization and barring check Nokia, Nokia Shanghai Bell discussion  
NR\_newRAT-Core

R2-1712352 Access Control applicability to different RRC states Nokia, Nokia Shanghai Bell  
discussion NR\_newRAT-Core

R2-1712353 Congestion Control for RRC\_CONNECTED Nokia, Nokia Shanghai Bell discussion  
NR\_newRAT-Core

R2-1712354 Access Barring Control for RRC\_INACTIVE Nokia, Nokia Shanghai Bell discussion  
NR\_newRAT-Core

R2-1712530 Signaling of access control parameters Ericsson discussion NR\_newRAT-Core

R2-1712531 Access control for NR Ericsson discussion NR\_newRAT-Core

R2-1712532 Access Control for RRC-initiated Access Attempts Ericsson discussion NR\_newRAT-  
Core

R2-1712533 Establishment causes for NR Ericsson discussion NR\_newRAT-Core

R2-1712534 [DRAFT] Reply LS on requirements on unified access control for 5GS Ericsson LS  
out NR\_newRAT-Core To:CT1 Cc:SA1, SA2

R2-1712535 [DRAFT] LS on Establishment Causes in NR Ericsson LS out NR\_newRAT-Core  
To:CT1 Cc:SA1, SA2

R2-1712590 Establishment cause and call type for NR access control ZTE Corporation, Sane Chips  
discussion Rel-15 R2-1710423

R2-1712591	Consideration on the access control in NR ZTE Corporation, Sane Chips	discussion	Rel-15	R2-1710424
R2-1712592	Access category selection information provided by AS	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1712593	ReplyLSONUnifiedAccessControl (Reply to R2-1712105)	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1712597	Consideration on the UAC category	ZTE Corporation, Sane Chips	discussion	Rel-15
R2-1712656	5G access control mechanism in IDLE and INACTIVE	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1712657	5G access control mechanism in CONNECTED	Intel Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1712840	Way-forward for NR access control	Samsung	discussion	NR_newRAT-Core Withdrawn
R2-1712841	Way-forward for NR access control	Samsung	discussion	NR_newRAT-Core
R2-1712842	NR access control procedure	Samsung	discussion	NR_newRAT-Core
R2-1712843	On linking Establishment Cause and standardized access category	Samsung	discussion	NR_newRAT-Core
R2-1712844	Barring configuration in NR access control	Samsung	discussion	NR_newRAT-Core
R2-1712845	Barring skip indicator in NR	Samsung	discussion	NR_newRAT-Core
R2-1712949	Considerations on Access Control in NR	KT Corp.	discussion	R2-1710897
R2-1713528	Unified Access Control	MediaTek Beijing Inc.	discussion	
R2-1713547	Access Control in RRC_INACTIVE	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1705184
R2-1713558	Basic Access Control in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1711487
R2-1713562	Access Control in NR for RRC_CONNECTED	Huawei Technologies France	discussion	Rel-15 NR_newRAT-Core R2-1711498
R2-1713565	Access Control for MT	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core R2-1711500
R2-1713694	Access category based access barring for RRC_IDLE and RRC_INACTIVE	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1711385
R2-1713699	Access category based access barring mechanism for RRC_CONNECTED	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1711398
R2-1713702	Random Access Backoff and Access Barring	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core R2-1711394
R2-1713903	Unified Access Control in different RRC Modes	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core R2-1710800

#### 10.4.1.9 Inter-Node RRC messages

*Structure and content of the Inter-Node RRC messages used for EN-DC procedures. Including output from email discussion [99bis#25][NR] Inter-node RRC messages (Samsung) This agenda item is relevant to EN-DC completion.*

R2-1713454	Report of e-mail [99bis#25][NR] on Inter-node RRC messages	Samsung		
	Telecommunications report			
	=> Endorsed as a starting point			
R2-1713144	Remaining issues on inter-node message design	Huawei,HiSilicon	discussion	Rel-15 NR_newRAT-Core

#### **Agreements**

- 1: The maximum power for FR1 the UE can use in NR SCG should be included in the SCG-ConfigInfo and SCGConfig
- 2: The UE capability coordination result should be included in the HandoverPreparationInformation message (at inter-MN HO).
- 2bis: The IE of the UE capability coordination result has the same format with the one in SCGConfigInfo.



R2-1713498 Inter-node signalling, some remaining issues Samsung Telecommunications discussion  
Rel-15 NR\_newRAT-Core

☒ **[100#31][NR] Inter-Node RRC message (Samsung)**

Continue to progress the content of internode messages. To also consider the LS from RAN3  
Intended outcome: TP/CR and report describing the FFS points that need to be discussed  
online at the next meeting

Deadline: Thursday 2017-01-11 (AH meeting)

R2-1712425 Inter-node RRC messages for dedicated configurations via F1 CATT discussion  
R2-1712501 Remaining details of Inter-Node RRC messages for EN-DC AT&T discussion  
R2-1712826 Coordination of Parameters for Measurements Report Triggering Fujitsu discussion Rel-  
15 NR\_newRAT-Core R2-1710355  
R2-1713680 Capability coordination in Inter-node RRC messages HTC Corporation discussion

#### 10.4.1.10 Other (non EN-DC)

*Other RRC related aspects*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712536 Wait Timer in NR Ericsson discussion NR\_newRAT-Core  
R2-1713181 Open issues on Inter-Node signalling for hand-over Ericsson discussion  
R2-1713777 UE Assistance Information for energy efficiency enhancement Samsung Electronics  
discussion R2-1711806

#### 10.4.2 LTE RRC changes for EN-DC

*No documents should be submitted to 10.4.2. Please submit to 10.4.2.x.*

*Note that changes to LTE RRCConnectionReconfiguration for configuring EN-DC will be discussed jointly with NR RRCConnectionReconfiguration in 10.4.1.3.1, and NR and :LTE aspects of SCG failure for EN-DC will be jointly discussed in 10.4.1.5.3.*

##### 10.4.2.1 Running CR

*This agenda item is relevant to EN-DC completion*

*Including output from email discussion [99bis#26][NR] LTE RRC running CRs (Samsung)*

R2-1713455 Introducing support for NR, changes relevant for NSA Samsung Telecommunications CR  
Rel-15 36.331 14.4.0 3115 1 B NR\_newRAT-Core R2-1711505  
=> revised to R2-1713949

R2-1713949 Introducing support for NR, changes relevant for NSA Samsung Telecommunications CR  
Rel-15 36.331 14.4.0 3115 2 B NR\_newRAT-Core R2-1711505

R2-1714142 Introducing support for NR, changes relevant for NSA Samsung Telecommunications CR  
Rel-15 36.331 14.4.0 3115 3 B NR\_newRAT-Core

R2-1713456 Introducing support for NR in 36.331, remaining issues relevant for NSA Samsung  
Telecommunications report Rel-15 NR\_newRAT-Core  
- Intel wonders where we capture the fallback behaviour for MR-DC band combinations.  
=> Items marked TBC in the list are confirmed.

R2-1713457 Introducing support for NR, changes only relevant for SA Samsung Telecommunications CR  
Rel-15 36.331 14.4.0 3186 - B NR\_newRAT-Core  
=> Noted

##### 10.4.2.2 RRM measurements

*Introduction of inter-RAT NR measurements within LTE RRC.*

*This agenda item is relevant to EN-DC completion.*

*Serving cell measurements*

R2-1713361 NR SN serving cell measurements in LTE measurement reports Nokia, Nokia Shanghai Bell  
discussion Rel-15 NR\_newRAT R2-1710855

*moved from 10.2.4 to 10.4.2.2*

- R2-1712426 NR serving cell measurements CATT discussion
- Discussed jointly with the previous paper
  - MediaTek agree with CATT. OPP have a similar understanding.
  - Ericsson think the compromise is to configure the measurements for on any event type.
  - Intel think that if it is configurable then the UE will have to support both cases so it is not a compromise.

Show of hands

- 1 - The UE does not send NR serving cell measurements in measurement reports associated with LTE Ax events. [10]
  - 2- The UE does send available NR serving cell measurements in measurement reports associated with LTE Ax events (configurability could be considered as a second question) [14]
- 1 NR serving cell measurements always sent for LTE Ax events [6]
  - 2 NR serving cell measurements sent for LTE Ax events are configurable [5]

**Agreements:**

- 1 The UE sends available NR serving cell measurements in measurement reports associated with LTE Ax events. Measurements are always provided (not configurable)
- => Offline discussion whether there any Ax events for which the serving cell measurements are not provided. Also discuss whether beam level measurement can be provided.
- => Offline discussion whether best neighbour cell information on the serving frequencies should be provided
- => Offline discussion #31, Qualcomm
- => Offline discussion to conclude on the support of whitelist (cell ids) for NR measurements reporting in LTE (Bx events). (Offline discussion #32, CATT)

- R2-1714225 Offline discussion #32: support of whiteCellList for NR measurements reporting in LTE (Bx events)

**Agreements**

- 1 whiteCellList is not supported for NR measurements reporting in LTE(Bx events). No use case is identified.
- FFS Whether anything is needed to be able to distinguish between SA and NSA cells.

- R2-1714185 Offline discussion #31 report

**Agreements related to Ax events**

- 1: UE sends available NR serving cell measurements in measurement reports with LTE A3, 4 and 5 events only. Available measurements are always provided (not configurable)
  - 2: Available NR beam level measurements are sent in measurement reports with LTE A3, 4 and 5 events only. Available measurements are always provided (not configurable)
  - 3: UE sends available NR best neighbour cell measurements in measurement reports with LTE A3, 4 and 5 events only. (configurable and controlled by existing configuration for best neighbour reporting).
- FFS Contents of the reporting in terms of beam, RS type, quantity (not imposing any additional requirements on performing measurements). (We will attempt to follow the same principles for serving and best neighbour cell reporting of beam, RS type, quantity, as agreed for NR.)

- R2-1712239 Discussion on Remaining Issues for EN-DC RRM OPPO discussion
- R2-1712665 NR serving cell measurement reporting in EN-DC Intel Corporation discussion Rel-15 NR\_newRAT-Core
- R2-1712793 Reporting of NR Serving Cell Measurements in EN-DC InterDigital discussion Rel-15 NR\_newRAT-Core

- R2-1712866 NR serving cell in LTE measurement report      MediaTek Inc.      discussion      Rel-15  
NR\_newRAT-Core
- R2-1713391 Inclusion of NR SN serving cell measurements in LTE measurement reports      Ericsson  
discussion      Rel-15      NR\_newRAT-Core
- R2-1713227 Remaining issues on measurement reports for EN-DC      CMCC      discussion      Rel-15  
NR\_newRAT-Core

*Other*

- R2-1713146 SSTD measurement for EN-DC      Huawei, HiSilicon      discussion      Rel-15      NR\_newRAT-Core  
P2
  - Nokia thinks that for 1tx it is needed to have the timing information before the PSCell is configured
  - Samsung also see some benefit for 1tx operation. Ericsson also agree that they could be configured before the PSCell. AT+T also see a benefit for this for cells that are not yet configured.
  - Qualcomm think if we do this it should have a separate capability and it would also have some measurement gap impact. Intel support Qualcomm

**Agreements**

- 1: The network can configure the NR SSTD measurement whenever a NR PSCell is configured
- 2: NR SSTD measurement reporting is extended for cells that are not yet configured in the case that no NR PSCell is configured
- 3: Introduce one new capability indicator for SSTD measurement for EN-DC when PSCell is configured.
- 4 Introduce one new capability indicator for SSTD measurement for EN-DC when PSCell is not configured.

=> Send LS to RAN4 to inform them of our decision and ask if any issue with the LTE measurement gap patterns to obtain the SSTD measurement. Other questions to ask RAN4 can be considered offline. R2-1714143 (Offline discussion #33, Nokia).

- R2-1714143 [DRAFT] LS on LTE measurement gap patterns for SSTD measurement      Nokia      LS out      Rel-15  
NR\_newRAT-Core      To:RAN4
  - Qualcomm think the SSTD measurement for neighbour cell is not needed for all UEs and the time differences can be determined from a few UEs and used for others. So this could be obtained just from UEs configured with PCell.
  - Nokia think it will still be needed for some UEs to configure them before the network has the timing. It is not a burden for UEs as it is not used all the time.

=> Approved in R2-1714227  
=> SSTD measurements for PSCell configured will be included in the spec for Dec 17 and SSTD measurements for PSCell no yet configured will be added (in March version) when RAN4 have responded.

- R2-1713921 Inter-RAT Measurement Framework      Samsung      discussion

**Agreements**

- 1: Cell level SINR based on SS-SINR is supported for inter-RAT NR measurements configured by LTE node
- 2: Cell level SINR based on SS-SINR can be used for triggering NR based B1/B2 events and reporting for inter-RAT NR measurements configured by LTE node

- R2-1713262 Support of reportOnLeave for E-UTRA B1 and B2 events      Nokia, Nokia Shanghai Bell  
discussion      Rel-15      NR\_newRAT-Core      R2-1711459

**Agreements**

- 1: reportOnLeave can be configured for B1 and B2 events for NR neighbours

- R2-1712502 Remaining details of inter-RAT NR measurements AT&T      discussion

R2-1712570	S-measure in LTE for EN-DC Core	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1712882	LTE Measurement Gap Design for Inter-RAT NR Cell Measurement discussion			Rel-15 NR_newRAT-Core MediaTek Inc.
R2-1713145	Remaining issues on measurement report NR_newRAT-Core	Huawei, HiSilicon	discussion	Rel-15
R2-1713722	NR measurements in LTE measurement report for EN-DC NR_newRAT-Core	LG Electronics Inc.	discussion	
<i>Withdrawn</i>				
R2-1712820	Inter-RAT measurement for EN-DC	Fujitsu	discussion	Rel-15 NR_newRAT-Core
<i>Withdrawn</i>				

### 10.4.2.3 Other

*Including the NR indication in LTE system information, etc  
This agenda item is relevant to EN-DC completion*

#### *NR indicator*

- R2-1713443 5G indicator for EN-DC Ericsson discussion Rel-15 NR\_newRAT-Core
- Vodafone think this should not be coupled with any new SIB such as that introduced for reselection. It could be a bit in SIB1 or SIB5.
  - Qualcomm think this would require an EN-DC UE to read the new SIB just for a single bit.
  - CMCC think we have not agreed to have a new SIB yet and also it should not be a mandatory bit.
  - LG think it is overkill to add the new SIB to send one bit.
  - Huawei think it should be a bit per PLMN. ZTE agree that it should be a bit per PLMN.
  - Qualcomm think a bit per PLMN is not needed as it can be combined with NAS indication to determine whether 5G is available to the UE. Intel wonder what NAS information is available given that MME might not be updated. Vodafone think the NAS indicator will just indicate that the UE is forbidden to display the NR indication, but the RAN sharing case where NR is not shared to all PLMNs does need to be supported

#### Show of hands

- 1 Add NR indicator in a new SIB (When SA is specified the NR reselection info will be introduced in this new SIB) [6]
- 2 Add NR indicator in an existing SIB2 [15]

#### **Agreement**

- 1 1 bit NR indicator is added per PLMN
- 2 NR indicator to be added to SIB2

R2-1712806	How to implement an NR indicator in LTE system information discussion			NTT DOCOMO, INC.
R2-1713639	Introduction of NR indicator - B NR_newRAT-Core	Qualcomm Incorporated	CR	Rel-15 36.331 14.4.0 3193

#### *Other*

- R2-1712367 IDC indication for EN-DC Qualcomm Incorporated discussion Rel-15 NR\_newRAT
- Intel think in LTE we only introduced the IDC indication after receiving input from RAN4.
  - LG think the proposal is natural but it would be good to understand how severe the problem is and it is not essential for December.
  - Samsung also think this is not very urgent for December.
  - DOCOMO think that RAN4's list of bands that affect other technologies is just LTE and there has been no discussion on RAN4.
  - Ericsson think it would be possible to reuse the current solution.
- => Noted
- R2-1712368 IDC indication for EN-DC Qualcomm Incorporated CR Rel-15 36.331 14.4.0 3131 -  
B NR\_newRAT
- R2-1712309 TP for inter-node message HTC Corporation discussion  
*moved from 10.4.2.1 to 10.4.2.3*

**Agreements**

- 1: RadioBearerConfig is added in AS-Config.
- 2: RadioBearerConfigS is added in AS-Config.

R2-1713864	Handling of EPS bearer identity in EN-DC	SHARP Corporation	discussion	Rel-15
	NR_newRAT-Core			
R2-1713730	Handling of SCG DRB configuration at RLF in EN-DC	NEC	discussion	Rel-15
	NR_newRAT-Core			
	<i>moved from 10.4.2.1 to 10.4.2.3</i>			
R2-1713891	TDM pattern for single uplink operation	Samsung Electronics GmbH	discussion	
R2-1713140	Running CR on 36.331 to support UP IP check failure handling	Huawei, HiSilicon		
	draftCR Rel-15 36.331 14.4.0 B	NR_newRAT-Core		

### 10.4.3 UE capabilities

*No documents should be submitted to 10.4.3. Please submit to 10.4.3.x.*

#### 10.4.3.1 UE capability structure

*This agenda item is relevant to EN-DC completion and SA.*

*Including output from email discussion [99bis#28][NR] UE capability ASN.1 structure (Intel)*

*Maximum 1 tdoc per company*

- R2-1712677 Email Disc on [99bis#28][NR] UE capability ASN.1 structure Intel Corporation  
discussion Rel-15 NR\_newRAT-Core
- Samsung ask if we need to capture the UE retrieval procedure. Is this needed for Dec. Intel think the feature not needed for Dec can be captured in the running CR rather than the TS.
  - => Aspects not needed for the Dec deadline will be captured in the running 331 and 306 CRs instead of the draft TSs.
- Decoupling DL and UL bands (Option1 (direct inclusion of possible UL combinations in DL combination) or option3 (referencing of UL combinations from DL combination))
- Ericsson favour that 1 DL can include several possible UL combinations. The key is how many UL combinations are likely to be references from a single DL combination and depends on how much additional information is included in the combinations.
  - DOCOMO think option 1 is better for readability. If we avoid to include other capabilities into the BCs then there is not much big difference between the option1 and option 3.
  - Samsung also has some preference for option 1. LG think option 3 has better signalling efficiency and in future it will be easier to extend it.
  - ZTE prefer option 3.
  - => Revisit this discussion after we have discussed other issues that might impact what is included in a BC
- Need to request band combination based on requested bands?
- Ericsson think it is complex to request band combinations and also inherits NR functionality in the NR messages. Wonder if it is easier to just have a request based on a list of bands. LTE eNB will need to be able to request MR-DC BCs and hence will need to understand NR BCs.
  - Samsung wonder if there will be requests for the NR bands and MR-DC BCs that are reported.
  - Intel think from LTE we observed that a request based on bands only can result in many BCs to be provided. hence it would be desirable to have both approaches if we want the request based on bands.
  - Qualcomm agree the request can be a BC without any additional information.
  - Intel wonder whether to request also the maximum number of carriers as in LTE. DOCOMO think that without fallback BC reporting we already have sufficient size reduction.
  - => Network request for BCs will be based on band information only (no additional information in the request such as bandwidth class, etc)
- Where to include modulation order in baseband processing combination?
- Intel prefer to wait for RAN4 response before we conclude this discussion.
  - Qualcomm think this is required per CC in the BPC. Intel think RAN4 previously responded that the modulation should be provided per CC.
  - Ericsson think the modulation could within the BPC but not per CC within the BPC.
  - Huawei think modulation could be just per band.

- Vodafone think RAN4 is preferring this to be per carrier.
- => Can be checked what RAN4 have requested and discuss further offline
- How to distinguish EN-DC band combination from NE-DC band combination
- Qualcomm think that the MR-DC BCs should not imply that the UE supports both option 3 and 4.
- => Capability to be added in LTE capability for EN-DC support, and in future an NR capability for NE-DC support, and an LTE capability for NG-EN-DC

R2-1712679 TP on UE capability Intel Corporation discussion Rel-15 NR\_newRAT-Core  
=> Revised to capture agreements from the discussion in R2-1714138 (Offline discussion #23)

R2-1714138 TP on UE capability Intel Corporation discussion Rel-15 NR\_newRAT-Core  
=> Open item on UL/DL coupling will be discussed as part of the Qualcomm email discussion on UE capability  
=> Change maxRAT-Capabilities to maxRAT-CapabilityContainers  
=> To is endorsed and will be updated again to capture agreements from this meeting via 38.306 email discussion.

R2-1712369 UE capability structure of NR and MR-DC Qualcomm Incorporated discussion Rel-15 NR\_newRAT  
- MediaTek say this is also their understanding.  
- Qualcomm think the bandwidth class is quite open in RAN4 and higher is not fully defined but here it implies larger BW.

P2

- LG support the proposal and think it is the most explicit way to provide the linking.
- Ericsson think we can use similar logic to determine the BPCs that are applicable as for the SA case.
- Intel support the proposal. MediaTek also support the proposal as there are concerns over sharing with the legacy RAT.
- Nokia think it is possible to link the LTE BPC to the NR BPCs and it is include in the container to solve the size issue. Think the proposal is not required and it can be solved with proposal 1.
- Samsung think the LT/NR BPC linking could just be in the NR RAT and provide some additional assistance information in the container.
- DOCOMO also think the proposal is not required. Regarding Samsung proposal if we look ahead to NE DC it might make sense to include he linking in the MR-DC container so common to EN and NE DC.
- Qualcomm think without this the MN will not be able to determine when it selects a BPC how many carriers will be available in the other RAT.
- Samsung suggest that the UE can indicate simple indication of how many carriers are available on NR side with each BPC.

P4

#### Agreements

- 1 Define in 38.331 that a given BPC is applicable in CA band combinations (for SA operation) which consist of bands 1) with equal bandwidth class, and 2) equal or higher MIMO layer capability. This applicability rule also applies to fallback combinations which may not be signalled.

- => Offline discussion to try to progress whether the linking to BPC should be included in the MRDC BCs.
- => Offline discussion to progress how to address the new information from RAN4 about MIMO capability and intra-band non-contiguous CA in relation to carrier separation
- => (Offline discussion #24, Qualcomm)

#### ☒ [100#32][NR] UE capabilities (Qualcomm)

To discuss whether the linking to BPC should be included in the MRDC BCs and how to address the new information from RAN4 about MIMO capability and intra-band non-contiguous CA in relation to carrier separation.  
Intended outcome: Report to AH meeting

Deadline: Thursday 2017-01-11

- R2-1713211 Structure for NR capability Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core
- P3
- Ericsson think this has the risk of becoming very big and also if we went for option 3 for decoupling then there would be not many DL bands that could link to each UL combination.
  - Intel under there will be only one SUL band in any given BC. Huawei think it need to be clear which of the normal UL bands is paired with the SUL band. Ericsson wonder if we need to distinguish between these cases. Intel think the UE would be able to support SUL paired with either of the ULs. Qualcomm also agree with the Intel comment.
- P4
- Samsung think this is only needed for UL sharing from the UE perspective.
  - Qualcomm think that no capability is needed for UL sharing from the UE perspective. Huawei think this capability is needed also for the sharing from the network perspective.
  - Huawei think in this case there is no overlapping bandwidth between LTE and NR.
  - Nokia think this is the combination of 1Tx , SUL and uplink sharing and from the UE perspective.
- Agreements
- 1 SUL will be supported by indicating the SUL band number in a band combination as any other UL band.
- => Offline discussion to try to progress the need for LTE-NR switching time capability in the Dec spec. (Offline discussion #25, Huawei)
- Update from offline:
- Nokia think that for the network perspective there is no switching within a single UE. This switching is only needed in the case of switching from the UE perspective.
- => Can be re-discussed after Dec 17.

- R2-1712851 Fallback mechanism for baseband processing combination NTT DOCOMO, INC. discussion Rel-15 NR\_newRAT-Core
- Nokia wonder how a fallback BPC differs from the fallback BCs.
- P2
- Intel think te max BW does not provide enough information as within this BW the number CCs could vary. It would help to also provide the maximum CCs. DOCOMO think this would also require the UE to request the CA BW class.
  - Ericsson think that limiting to a certain number of carriers is not useful. If UEs support a certain number of carriers there are always networks that support this number of carriers. It only helps for networks that support fewer number of carriers.

**Agreements for standalone and MR-DC**

1 The UE only reports the BPC combinations associated to the reported band combinations rather than BPC combinations associated to all the band combinations supported by the UE, where the reported BPC combinations include the super set BPC combinations and fallback BPC combinations where the capabilities are different from the superset BPC.

- Late*
- R2-1712680 CR on MR-DC capability Intel Corporation CR Rel-15 36.331 14.4.0 3143 -  
C NR\_newRAT-Core
- R2-1712694 BPC Design Discussion Intel Corporation discussion Rel-15 NR\_newRAT-Core
- R2-1713432 UE Capability Signalling Structure Ericsson discussion Rel-15 NR\_newRAT-Core

### 10.4.3.2 UE capability coordination

*This agenda item is relevant to EN-DC completion.*

*Maximum 1 tdoc per company*

- R2-1713501 UE capability coordination, some remaining aspects Samsung Telecommunications  
discussion Rel-15 NR\_newRAT-Core

**Agreements**

1 Introduce the following inter-node signalling for coordination of EN-DC dependencies:

- c) SCG-ConfigInfo (MN to SN): MN indicates which NR BCs the SN can select by field allowedBandCombinationNR that indicates a list of indices of all the EN-BCs in the MR DC capability container that includes the LTE BC it selected
- d) SCG-Config (SN to MN for the case that the SN wants to request to use a different EN-BC): SN indicates which NR BC the SN wants to use by field requestedBandCombinationNR that indicates a list of indices of all the EN-BC in the MR DC capability container that includes the NR BC it wants to use.

=> BPC coordination to be discussed offline as part of offline discussion #24

- |            |  |                                |            |      |
|------------|--|--------------------------------|------------|------|
| R2-1713147 | Remaining issues on UE capability coordination<br>15 NR_newRAT-Core          | Huawei, HiSilicon              | discussion | Rel- |
| R2-1713359 | Further considerations on MR-DC capability coordination<br>discussion Rel-15 | Nokia Solutions & Networks (I) |            |      |

### 10.4.3.3 Other aspects for EN-DC

*Any other aspect related to UE capabilities relevant for EN-DC  
Including output from email discussion [99bis#27][NR] L2/3 capabilities (Intel)  
This agenda item is relevant to EN-DC completion.*

- |            |   |                   |            |      |
|------------|---|-------------------|------------|------|
| R2-1712678 | Email Disc on [99bis#27][NR] L2/3 capabilities<br>15 NR_newRAT-Core<br>=> Revised to R2-1714130 | Intel Corporation | discussion | Rel- |
| R2-1714130 | Email Disc on [99bis#27][NR] L2/3 capabilities<br>15 NR_newRAT-Core                             | Intel Corporation | discussion | Rel- |

**Agreements**

- 1 UE capability parameters will be introduced for features that are optional and for features that are mandatory but required ability to indicate successful IOT (no need to decide whether a feature is optional or mandatory with IoT bit at the time the capability parameter is defined).

=> Offline discussion to progress the lists. Aim to create a documents with lists that can be easily agreed plus list of FFS points that need more discussion (at future meeting). (Offline discussion #26, Intel)

- |            |  |                   |  |  |
|------------|--|-------------------|--|--|
| R2-1714226 | Offline discussion output on L2/3 capabilities | Intel Corporation |  |  |
|------------|--|-------------------|--|--|

**Agreements:**

- 1: Mandatory features without the need of any UE capability signalling:
- 2: Features with the need of a UE capability signalling (FFS whether to be 'mandatory with IOT' or optional) as listed in R2-1714226 (except Configured grant type 2)
- 3: RAN2 is asked to confirm after March (i.e. ASN.1 freeze), there is no mandatory feature w/o IOT bit in Rel-15, unless it is relevant to the idle mode.
- 4: Features needed further discussion as listed in R2-1714226
- 5: Features needed RAN1/4 inputs or RAN2 decision as listed in R2-1714226 (with additionally Configured grant type 2)
- 6: Features not required for Dec. 2017 version as listed in R2-1714226:
- 7: MAC, RLC capabilities are included in NR UE capability.
- 8: PDCP capabilities are included in both LTE UE capability and NR UE capability.

- |            |   |          |            |                   |
|------------|---|----------|------------|-------------------|
| R2-1713345 | Async-sync operation and capabilities<br>Core | Ericsson | discussion | Rel-15 NR_newRAT- |
|------------|---|----------|------------|-------------------|

**Agreements**

- 1 In inter-band EN-DC, asynchronous UE operation is default operation and thus no separate capabilities are needed (Support of SSTD measurement for EN-DC in LTE will be discussed separately)
- 2 Single TX operation may be operated by the network with synchronised and non-synchronised operation. No additional UE capability parameter is needed to distinguish



- whether the UE supports operation in synchronised and non synchronised cases. (RAN2 understand that single Tx operation is only applicable for inter-band EN-DC)
- 3 In intra-band TDD EN-DC, the synchronous operation is only supported in Rel-15. No additional UE capability parameter is needed for this case
  - 4 In intra-band FDD EN-DC, a single capability bit is introduced to indicate if the UE supports asynchronous/synchronous operation.

=> Check offline with RAN4 whether capability bit is needed per UE or per BC for support of simultaneous RXTX for inter-band TDD/TDD and inter-band FDD/TDD cases. And conclude whether RAN2 include it as per UE or per BC.(Offline discussion #27, Intel)

Update from offline from Intel: Think it should be per BC but it is not explicitly captured in RAN4. Suggest to send an LS.

☒ **[100#01][NR] RAN4 LS for simultaneous RXTX for inter-band TDD/TDD and inter-band FDD/TDD cases (Intel)**

Intended outcome: Approved LS

Deadline: Thursday 2017-12-07

=> Approved in R2-1714263.

R2-1712505 UE capability indication of bearer split for EN-DC AT&T discussion  
*moved from 10.4.3.2 to 10.4.3.3*

=> Parameter is already included in the list of parameters to be discussed as part of Offline discussion #26.

R2-1712692 L2 buffer size capability Intel Corporation discussion Rel-15 NR\_newRAT-Core

- DOCOMO ask if the UE needs to be used based on the worst case band combination.
- MediaTek think we only need to use a single RTT to determine the buffer size that is maximum of the all the RTT of the CCs. Intel confirm this is the intention.
- DOCOMO ask which HARQ RTT value is used. Intel assume that will be provided from RAN1.
- Samsung think the calculation should be based on what the UE can actually do in terms of subcarrier spacing.

=> Offline discussion to try to conclude the values to be used in the buffer calculation. Check the status of RAN4 discussion on the numerologies to be supported within each band. (Offline discussion #28, Intel)

R2-1714200 Summary of offline discussion #28 on L2 buffer size capability Intel

**Agreements**

- 1 For layer 2 buffer size calculation, the sum of Xn delay and queuing delay is 25 ms (1 way delay).

☒ **[100#33][NR] L2 buffer size (Intel)**

Progress the details of the L2 buffer size calculation based on proposals 1 and 2 of R2-1714200

Intended outcome: Report to next meeting

Deadline: Thursday 2018-01-11

*Late*

R2-1713950 Harmonised transfer of NR related capabilities Samsung Telecommunications discussion  
Rel-15 NR\_newRAT-Core

- Qualcomm think this approach would require a change to S1 in order to store 2 capability containers. RAN3 spec refers to a single specific RRC message for the capabilities. Samsung think there would still be only one container stored in the CN.

=> Noted

#### 10.4.3.4 Temporary capability restriction

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.  
Maximum 1 tdoc per company*

- R2-1712774 UE radio access capabilities change vivo discussion Rel-15 NR\_newRAT-Core  
R2-1710945
- R2-1713212 MN-SN coordination for UE temporary access capability restriction Huawei, HiSilicon  
discussion Rel-15 NR\_newRAT-Core
- R2-1713428 UE Capability Restrictions Ericsson discussion Rel-15 NR\_newRAT-Core R2-  
1711521

#### 10.4.3.5 Other aspects for non EN-DC

*Any other stage 2 aspect related to UE capabilities relevant for non EN-DC cases  
This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

- R2-1712676 Temporary capability restriction Intel Corporation discussion Rel-15 NR\_newRAT-  
Core R2-1710611
- R2-1712913 Reducing the size of UE capabilities Qualcomm Incorporated discussion Rel-15  
NR\_newRAT R2-1711561
- R2-1713210 Network handling on UE static access capability Huawei, HiSilicon discussion Rel-  
15 NR\_newRAT-Core
- R2-1713429 UE Capability Compression Ericsson discussion Rel-15 NR\_newRAT-Core  
R2-1711522
- R2-1713499 Use of identifier representing NR UE capabilities, baseline Samsung Telecommunications  
discussion Rel-15 NR\_newRAT-Core
- R2-1713548 UE capability retrieval framework in NR NTT DOCOMO INC. discussion Rel-15  
NR\_newRAT-Core

#### 10.4.3.6 TS

*Latest 38.306, other rapporteur inputs, anything related to specification methodology.  
This agenda item is relevant to EN-DC completion*

- R2-1712587 Draft TS38.306v004 Intel Corporation draft TS Rel-15 38.306 0.0.4 NR\_newRAT-  
Core  
=> Revised in R2-1714141 to capture agreements from this meeting (Offline discussion #29,  
Intel)
- R2-1714141 Draft TS38.306v004 Intel Corporation draft TS Rel-15 38.306 0.0.4 NR\_newRAT-  
Core  
=> Endorsed
- ☒ **[100#18][NR] 38.306 and UE capability ASN.1 (Intel)**  
Updated draft TS to capture agreements from this meeting  
Intended outcome: Agreed TS for submission to RAN for (one step) approval, and agreed  
ASN.1 for inclusion into 38.331  
Deadline: Thursday 2017-12-07  
=> Agreed: R2-1714270: The TP on UE capabilities  
R2-1714271: 38.306, v0.1.0
- R2-1712681 Open issues on UE capability Intel Corporation discussion Rel-15 NR\_newRAT-  
Core  
=> Noted

### 10.4.4 Idle/inactive mode procedures

#### 10.4.4.1 TS

*Latest 38.304, other rapporteur inputs, anything related to specification methodology. Please submit any new text proposals  
to the appropriate agenda item.*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1713613 New Generation Radio Access Network; User Equipment (UE) procedures in Idle mode  
Qualcomm Incorporated draft TS Rel-15 38.304 0.0.6 NR\_newRAT-Core R2-1711588

#### 10.4.4.2 Selection/reselection rules

*Basic criteria and rules for cell selection and reselection*

*Maximum 1 tdoc per company*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712344 Cell Reselection in RRC\_INACTIVE State Ericsson discussion NR\_newRAT-Core  
R2-1712683 Further considerations for cell (re)selection Intel Corporation discussion Rel-15 NR\_newRAT-Core  
R2-1712775 Cell selection reselection in NR vivo discussion Rel-15 NR\_newRAT-Core R2-1710946  
R2-1712962 Service based Inter-RAT cell reselection China Telecom discussion  
R2-1713204 Cell selection and reselection for NR IDLE - cell selection/reselection criteria Nokia, Nokia  
Shanghai Bell discussion Rel-15 NR\_newRAT-Core R2-1711059  
R2-1713290 Cell selection and reselection rules Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core R2-1710466  
R2-1713795 Cell selection reselection method for NR IDLE mode Samsung Electronics discussion  
R2-1711716

#### 10.4.4.3 Cell quality derivation

*Derivation of cell quantity from beam measurements (including filtering and FFS points from previous meetings)*

*Maximum 1 tdoc per company*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712338 Cell quality derivation for idle/inactive UEs Ericsson discussion NR\_newRAT-Core  
R2-1712429 Considerations on idle mode measurement CATT discussion R2-1707912  
R2-1712684 Cell quality derivation for idle mobility Intel Corporation discussion Rel-15  
NR\_newRAT-Core R2-1710629  
R2-1712776 Cell quality derivation in idle inactive mode vivo discussion Rel-15 NR\_newRAT-Core  
R2-1710947  
R2-1713203 Cell selection and reselection for NR IDLE - cell quality derivation Nokia, Nokia Shanghai Bell  
discussion Rel-15 NR\_newRAT-Core R2-1711058  
R2-1713291 Derivation of cell quality in IDLE/INACTIVE Huawei, HiSilicon discussion Rel-15  
NR\_newRAT-Core R2-1710467  
R2-1713364 Cell Quality Derivation for Cell Reselection Convida Wireless LLC discussion Rel-15  
NR\_newRAT-Core R2-1711442  
R2-1713719 Cell quality derivation in IDLE/INACTIVE LG Electronics Inc. discussion Rel-15  
NR\_newRAT-Core R2-1710807  
R2-1713794 Cell quality derivation method for NR IDLE mode Samsung Electronics discussion R2-1711715

#### 10.4.4.4 Service based reselection

*Maximum 1 tdoc per company*

*This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712427 Service based cell reselection CATT discussion R2-1707913  
R2-1712537 Service-based RAT/frequency selection in INACTIVE or in IDLE Ericsson discussion  
NR\_newRAT-Core  
R2-1712685 Service based cell reselection Intel Corporation discussion Rel-15 NR\_newRAT-  
Core R2-1710630  
R2-1713292 Service-based camping Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core  
R2-1710469  
R2-1713363 Cell Re-selection: Service Specific Frequency Prioritisation in NR Samsung R&D Institute India  
discussion Rel-15 NR\_newRAT-Core R2-1707687  
R2-1713573 Service-based cell reselection ITRI, ASUSTeK discussion NR\_newRAT-Core R2-1711769

R2-1713725 Service based cell reselection LG Electronics Inc. discussion Rel-15 NR\_newRAT-Core  
R2-1710813

#### 10.4.4.5 Selection/reselection - other aspects

*Including, for example mobility states, speed dependent scaling, forward compatibility for CSG, cell reservations, etc  
This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712340 Cell reselection measurement rules Ericsson discussion NR\_newRAT-Core  
R2-1712341 Mobility states and state based scaling Ericsson discussion NR\_newRAT-Core  
R2-1710448  
R2-1712342 Considering the number of good beams for cell reselection Ericsson discussion  
NR\_newRAT-Core  
R2-1712343 Cell selection and reselection criteria and measurement configuration Ericsson  
discussion NR\_newRAT-Core  
R2-1712345 Cell-specific prioritisation at reselection Ericsson discussion NR\_newRAT-Core  
R2-1710452  
R2-1712428 Service types in Inactive Mode CATT discussion R2-1707911  
R2-1712528 Camping in NR Ericsson discussion NR\_newRAT-Core R2-1710475  
R2-1712529 CSG-like selection and camping limitations in NR Ericsson discussion NR\_newRAT-Core  
R2-1712777 Consideration on forward compatibility vivo discussion Rel-15 NR\_newRAT-Core  
R2-1710948  
R2-1713293 Speed dependent mobility in Idle and Inactive mode Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core R2-1710468  
R2-1713294 Cell reservation and forward compatibility for CSG in NR Huawei, HiSilicon discussion  
Rel-15 NR\_newRAT-Core R2-1710470  
R2-1713760 NR forward compatibility issue for CSG LG Electronics Inc. discussion Rel-15 R2-  
1711646  
R2-1713762 Idle Measurement Enhancement using UE speed LG Electronics Inc. discussion Rel-  
15 R2-1711648  
R2-1713798 Speed dependant parameters in NR IDLE and INACTIVE mode mobility Samsung Electronics  
discussion R2-1711722  
R2-1713799 Cell Barring and Reservations for NR Qualcomm Incorporated discussion R2-1710805  
R2-1713811 CSG Type Functionality for NR Qualcomm Incorporated, Deutsche Teleko discussion  
R2-1710806

#### 10.4.4.6 Idle/inactive paging

*Including beam related aspects, response driven paging and calculation of paging occasion.  
This agenda item is not relevant to EN-DC completion and is not expected to be treated at this meeting.*

R2-1712339 Response-driven paging to reduce beam sweeping overhead in NR Ericsson  
discussion NR\_newRAT-Core  
R2-1712380 Providing more information relating to MT data in Paging Beijing Xiaomi Mobile Software  
discussion Rel-15 R2-1711046  
R2-1712383 Dedicated RNTI(s) for response-driven paging Ericsson discussion NR\_newRAT-  
Core  
R2-1712384 Response beam aggregation for response-driven paging Ericsson discussion  
NR\_newRAT-Core  
R2-1712525 DRX in idle state Ericsson discussion NR\_newRAT-Core  
R2-1712526 Draft LS reply on maximum DRX value for NR in Rel-15 Ericsson LS out NR\_newRAT-  
Core To:SA2 Cc:CT1, RAN3  
R2-1712527 Configuration of paging transmissions in multi-beam operation Ericsson discussion  
NR\_newRAT-Core  
R2-1712543 Definition of Paging Frame and Paging Occasion Huawei, HiSilicon discussion Rel-  
15 Withdrawn  
R2-1712544 Efficiency of direct and response-driven paging Huawei, HiSilicon discussion Rel-  
15 Withdrawn  
R2-1712594 Calculation of paging occasion in NR ZTE Corporation, Sane Chips discussion Rel-  
15 R2-1710425

R2-1712595	Paging occasion mechanism comparision	ZTE Corporation, Sane Chips	discussion	Rel-15	R2-1710426
R2-1712596	Overhead Reduction for Paging in Multi-beam Operation	ZTE Corporation, Sane Chips	discussion	Rel-15	R2-1710427
R2-1712686	Calculation of paging occasion	Intel Corporation	discussion	Rel-15	NR_newRAT-Core R2-1710631
R2-1712803	Paging in High Frequency InterDigital		discussion	Rel-15	NR_newRAT-Core
R2-1712804	Paging Indicator Details	InterDigital	discussion	Rel-15	NR_newRAT-Core R2-1710679
R2-1713365	UE Assisted Paging	Convida Wireless LLC	discussion	Rel-15	NR_newRAT-Core R2-1711425
R2-1713370	PO Determination for Paging Reception	Samsung R&D Institute India	discussion	Rel-15	NR_newRAT-Core R2-1707689
R2-1713376	Paging in NR – Beamforming Aspects	Samsung R&D Institute India	discussion	Rel-15	NR_newRAT-Core R2-1707688
R2-1713494	Definition of Paging Frame and Paging Occasion	Huawei, HiSilicon	discussion	Rel-15	R2-1710540
R2-1713495	Efficiency of direct and response-driven paging	Huawei, HiSilicon	discussion	Rel-15	R2-1710541
R2-1713496	Paging mechanism with beam sweeping	Huawei Technologies France	discussion	Rel-15	NR_newRAT-Core R2-1711501
R2-1713695	CN paging DRX in RRC_IDLE	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core R2-1711386
R2-1713732	Consideration on NR paging	Qualcomm Incorporated	discussion	R2-1710793	
R2-1713743	Discussion on response beam selection in indication-based paging	ASTRI, TCL Communication Ltd.	discussion		
R2-1713746	Discussion on downlink overhead reduction for NR paging	ASTRI, TCL Communication Ltd.	discussion		
R2-1713781	Use of multiple P-RNTIs for NR paging	Qualcomm Incorporated	discussion	R2-1710798	
R2-1713873	Paging for wideband carrier in NR	Samsung	discussion	Rel-15	

## 11 Comebacks

*This agenda item will be used during the meeting. No documents are supposed to be submitted by delegates.*

### 11.1 Breakout sessions

#### 11.1.1 Report from Break-Out session

*Report from session on Rel-14 and Rel-15 LTE*

- R2-1714116 Report from Break-Out Session, Vice-Chair (CMCC)  
 CBF: Report from LTE Break-Out Session, Vice-Chair (CMCC)  
 => Approved

Agreed Revision of agreements from R2-1712255

- 1 Transition between legacy SCell state and fast activation state is via MAC-CE (i.e., similar to legacy).
- 2 Legacy state transition mechanisms are applicable for transition between legacy SCell activated and SCell deactivated states. TEI15 :

- R2-1714087 LTE Control Plane Latency Reduction      Vodafone LS out      RAN1, RAN  
 => Approved in R2-1714186

**euCA:**

**CB on Friday:** => Draft LS in R2-171xxx to inform RAN1 and RAN4 our agreements of introducing new SCell fasct activation state. (Offline 144, Qualcomm)

R2-1714239 Introducing new SCell fast activation state Qualcomm LS out RAN1, RAN4

- ☒ **[100#02][LTE/euCA] LS to RAN1/RAN4 on SCell fast activation (Qualcomm)**  
Intended outcome: Approved LS  
Deadline: Thursday 2017-12-07  
=> Approved in R2-1714239.

#### UAV:

CBF to find a way to capture the simulation results. (Offline #111, Huawei). TP can be provided in R2-1714088

**CB on Friday=>** Try to endorse the revised TP (offline#168, DCM) in R2-171XXXX

**CB on Friday=>** Try to endorse the revised TP (offline#168, DCM) in R2-171XXXX

R2-1714088 TP on simulation results Huawei  
=> Can be included in the report and then discussed as part of the email discussion on the TR.

R2-1714232 Text Proposal for UE Identification DoCOMo  
=> Agreed

R2-1714231 Text Proposal for UAV conclusions DoCOMo  
=> Agreed

R2-1714242 Reply LS on Certification/License and Identification of Aerial Vehicles Nokia LS out  
To:SA2, SA1, RAN3  
=> Remove " No involvement from SA2 is currently foreseen for this aspect."  
=> WI code to be corrected  
=> Other minor editorials  
=> Approved in R2-1714248

R2-1714247 LS on RAN1 Conclusions and TPs approved in RAN1#91  
=> Noted

### 11.1.2 Report from Break-Out session

*Report from session on Rel-13/14 NB-IoT, Rel-13/14 MTC, Rel-15 NB-IoT WIs*

R2-1714115 Report from Break-Out Session, Session Chair (MediaTek)  
CBF: Report from LTE Break-Out Session, Vice-Chair (MediaTek)  
=> Approved

### 11.1.3 Report from Break-Out session

*Report from session on Rel-14 LTE and NR UP*

R2-1714117 Report from Break-Out Session, Vice-Chair (InterDigital)  
CBF: Report from LTE Break-Out Session, Session Chair (InterDigital)  
=> Approved

R2-1714036 UE capabilities for Tx antenna selection Qualcomm Incorporated, Ericsson, SoftBank CR  
Agreement R2-1710551, R2-1712311 Rel-13 36.331 13.7.0  
LTE\_CA\_TDD\_FDD-Core 3080 3 F  
=> Agreed  
=> Rel-14 shadow CRs are also agreed R2-1714240

R2-1714037 UE capabilities for Tx antenna selection CR Agreement R2-1711846, R2-1712313  
Rel-13 36.306 13.7.0 LTE\_CA\_TDD\_FDD-Core 1510 3 F  
=> Agreed  
=> Rel-14 shadow CRs are also agreed R2-1714241

- R2-1714038 Tabel 8.2-2 reformatting CR R2-1713551 Rel-14 36.302 14.3.0 TEI12  
 1191 1 F  
 => Agreed
- R2-1714054 Clarification on csi-RS-ConfigNZPId Qualcomm Incorporated, Ericsson CR Rel-  
 => Agreed
- R2-1714055 Clarification on csi-RS-ConfigNZPId Qualcomm Incorporated, Ericsson CR Rel-  
 => Agreed
- R2-1714040 Introduction of a new UE capability for ssp10 with less CRS CR R2-1713242  
 Rel-14 36.306 14.4.0 LTE\_UL\_CAP\_enh-Core 1536 1 B  
 => Agreed
- R2-1714041 Introduction of a new configuration for ssp10 with less CRS CR R2-1713243  
 Rel-14 36.331 14.4.0 LTE\_UL\_CAP\_enh-Core 3180 1 B  
 => Agreed
- R2-1712578 L2 parameter content of RRCReconfiguration message Huawei  
 => Rapporteur will create a list of parameters that still need discussions  
 => Revised in R2-1714235 to include agreements from this meeting
- R2-1714235 L2 parameter content of RRCReconfiguration message Huawei
- ☒ **[100#19][NR] L2 parameters ASN.1(Huawei)**  
 Intended outcome: Agreed TP to be incorporated into 38.331  
 Deadline: Thursday 2017-12-07  
 => The TP is agreed in R3-1714277
  - ☒ **[100#34][NR] L2 parameter FFSs (Huawei)**  
 Progress FFS points to next meeting  
 Intended outcome: Report to next meeting  
 Deadline: Thursday 2018-01-11

#### 11.1.4 Report from Break-Out session

*Report from session on Rel-15 MTC*

- R2-1714118 Report from Break-Out Session, Session Chair (Ericsson)  
 CBF: Report from LTE Break-Out Session, Session Chair (Ericsson)  
 => Approved

#### 11.1.5 Report from Break-Out session

*Report from session on Rel-15 V2X WI*

- R2-1714119 Report from Break-Out Session, Session Chair (Intel)  
 CBF: Report from LTE Break-Out Session, Session Chair (Intel)  
 => Scope of email discussion Radio resource pool sharing is extended to include possible solutions  
 => Approved
- R2-1714131 LS on Reliability for eV2X LS out Ericsson  
 => Approved in R2-1714187

## 11.2 Main session

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## 12 Outgoing LSs

*Draft LSs should be submitted to their corresponding agenda item if there is one. If there is no appropriate agenda item, draft LSs may be submitted to this agenda item.*

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## 13 Any other business

RAN2 AH0118 in Vancouver (NR scope only)

- => RAN2 AH can treat incoming NR LSs and approve outgoing NR LSs
- => RAN2 AH can agree in principle CR

R2-1713652 Celebration of RAN2#100 Ericsson discussion

- => Approve Mats Folke's rendition of "Ode to 36.331" to the tune of "My favourite things"
- => Revisit in RAN2#200
- => Approved

R2-1714209 LS to RAN2 on the occasion of their centenary meeting (R4-1714481; contact: James Clerk Maxwell) RAN4 LS in

- => Rejected
- 

## 14 Closing of the meeting (17:00)

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### Annex A: List of participants

RAN2#100 participants list is at: <http://webapp.etsi.org/3GPPRegistration/fViewPart.asp?mid=17086>.

Total number of participants: 276 (registered 336)

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### Annex B: List of Tdocs

The list of tdocs of this RAN2#100 is attached to this report.

Total of 2187 tdoc numbers were allocated of which 2086 tdocs were available.

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### Annex C: Incoming liaison statements

TDoc	Title	Source	Status	Rel	Related WIs	To	Cc	Original LS
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R2-1712102	FURTHER INFORMATION RELATED TO DRAFT NEW REPORT FOR IMT-2020 EVALUATION	ITU-R WP 5D	noted			RAN2		LS_EOs_5D_758_temp441
R2-1712103	Reply LS on CN node selection for LTE features when E-UTRA is connected to 5G CN (C1-174593; contact: Qualcomm)	CT1	noted	Rel-15	5GS_Ph1-CT	RAN2	SA2	C1-174593
R2-1712104	Reply LS on Early Data Transmission (C1-174595; contact: Qualcomm)	CT1	noted	Rel-15	LTE_eMTC4-Core, NB_IoTEnh2-Core	RAN2, SA2	RAN3, SA3, CT4	C1-174595
R2-1712105	LS on requirements on unified access control for 5GS (C1-174626; contact: LGE)	CT1	noted	Rel-15	5GS_Ph1-CT	SA1, RAN2	SA2	C1-174626
R2-1712106	Reply LS on Restricted Use of Enhanced Coverage (C1-174627; contact: Nokia)	CT1	noted	Rel-15	CloT_Ext	RAN6, SA2	RAN2	C1-174627
R2-1712107	Reply LS on the number of bearers (C1-174658; contact: Samsung)	CT1	noted	Rel-15	TEI15	SA2, RAN2	CT4, RAN, CT, SA, SA1	C1-174658
R2-1712108	Response LS to RAN2 on jumbo frames (S3-172515; contact: Ericsson)	SA3	noted	Rel-15	NR_newRAT-Core	RAN2		S3-172515
R2-1712109	Reply LS on Reply LS on 5GS Security aspects seeking resolution (S3-172517; contact: Ericsson)	SA3	noted	Rel-15	5GS_Ph1	SA2, RAN2		S3-172517
R2-1712110	LS on 2Gbps category (R1-1719084; contact: Qualcomm)	RAN1	noted	Rel-14	TEI14	RAN2, RAN		R1-1719084
R2-1712111	LS on MBSFN subframe configuration in handover signalling for eMTC (R1-1719091; contact: Qualcomm)	RAN1	noted	Rel-13	LTE_MTCe2_L1	RAN2		R1-1719091
R2-1712112	LS on Comb 2 SRS enhancements for BL/CE UEs (R1-1719093; contact: Qualcomm)	RAN1	noted	Rel-14	LTE_feMTC-Core	RAN2		R1-1719093
R2-1712113	LS on Supportable RNTI Length on DCI (R1-1719094; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1719094
R2-1712114	LS on agreements on early data transmission during random access procedure for NB-IoT and BL/CE UEs in Rel-15 (R1-1719103; contact: HiSilicon)	RAN1	noted	Rel-15	LTE_eMTC4, NB_IoTEnh2	RAN2		R1-1719103
R2-1712115	LS to RAN2 on carrier selection rules for Rel-15 V2X (R1-1719151; contact: Huawei)	RAN1	noted	Rel-15	LTE_eV2X-Core	RAN2		R1-1719151
R2-1712116	LS reply on SPS for short TTI (R1-1719154; contact: Huawei)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2		R1-1719154
R2-1712117	LS to RAN4 on resource selection for Mode-4 sidelink CA (R1-1719159; contact: Intel)	RAN1	noted	Rel-15	LTE_eV2X	RAN4	RAN2	R1-1719159
R2-1712118	LS on NR Paging Mechanisms (R1-1719164; contact: Huawei)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1719164
R2-1712119	LS on higher layer signalling for special subframe configuration 10 (R1-1719204; contact: CMCC)	RAN1	noted	Rel-14	LTE_UL_CAP_e nh-Core	RAN2		R1-1719204
R2-1712120	LS on updates to TS36.300 for short TTI and short processing time (R1-1719205; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2		R1-1719205
R2-1712121	LS on agreements on UL HARQ-ACK feedback in Rel-15 LTE eMTC (R1-1719206;	RAN1	noted	Rel-15	LTE_eMTC4	RAN2		R1-1719206

	contact: ZTE)							
R2-1712122	LS on wake-up signal configuration and procedures for NB-IoT and BL/CE UEs in Rel-15 (R1-1719207; contact: HiSilicon)	RAN1	noted	Rel-15	LTE_eMTC4, NB_IOTenh2	RAN2		R1-1719207
R2-1712123	LS on RAN1 observation on RSRP statistics for aerial vehicles (R1-1719052; contact: NTT DOCOMO)	RAN1	noted	Rel-15	FS_LTE_Aerial	RAN2		R1-1719052
R2-1712124	LS on Ultra Reliable Low Latency Communication for LTE (R1-1719210; contact: Ericsson)	RAN1	noted	Rel-15	LTE_HRLLC	RAN2		R1-1719210
R2-1712125	Response LS on simultaneous transmission and/or reception over EPC/E-UTRAN and 5GC/NR (R1-1719211; contact: Intel)	RAN1	noted	Rel-15	5GS_Ph1, NR_newRAT	SA2, RAN4	RAN2	R1-1719211
R2-1712126	Reply LS on RACH agreements (R1-1719214; contact: CATT)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1719214
R2-1712127	LS on HCS (R1-1719217; contact: Huawei)	RAN1	noted	Rel-15	LTE_1024QAM_DL	RAN2, RAN4		R1-1719217
R2-1712128	LS on system information broadcast for CU/DU split scenario (R3-174199; contact: CATT)	RAN3	noted	Rel-15	NR_newRAT-Core	RAN2	RAN1	R3-174199
R2-1712129	LS on Centralized Retransmission Solution (R3-174219; contact: Ericsson)	RAN3	noted	Rel-15	NR_newRAT	RAN2		R3-174219
R2-1712130	LS on length of NR Cell Identity (R3-174229; contact: Nokia)	RAN3	noted	Rel-15	NR_newRAT-Core	RAN2		R3-174229
R2-1712131	Reply LS on UE/RAN Radio Information and Compatibility Request (R3-174231; contact: Nokia)	RAN3	noted	Rel-15	NR_newRAT-Core	SA2	RAN2	R3-174231
R2-1712132	LS on MN-initiated SN change for delta signalling (R3-174233; contact: Nokia)	RAN3	noted	Rel-15	NR_newRAT-Core	RAN2		R3-174233
R2-1712133	LS on handling concurrent running of security procedures (S3-172565; contact: Ericsson)	SA3	noted	Rel-15	5GS_Ph1	RAN3	RAN2	S3-172565
R2-1712134	LS reply on Support for fake gNB detection mechanisms (R4-1711318; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	SA3	RAN1, RAN2	R4-1711318
R2-1712135	Reply to Reply LS on LTE call redirection to GERAN (S3c0011; contact: Nokia)	SA3	noted	Rel-15	TEI15	CT1, RAN2, RAN3		S3c0011
R2-1712136	LS on single Tx switched UL (R4-1711610; contact: Apple)	RAN4	noted	Rel-15	NR_newRAT	RAN2	RAN1, RAN3	R4-1711610
R2-1712137	LS on mmWave UE NC CA capability signalling (R4-1711623; contact: Qualcomm)	RAN4	noted	Rel-15	NR_newRAT	RAN2		R4-1711623
R2-1712138	Reply LS on UE capability signalling for sTTI configurations (R4-1711726; contact: Ericsson)	RAN4	noted	Rel-15	LTE_sTTIandPT	RAN1	RAN2	R4-1711726
R2-1712139	LS to RAN5 cc RAN1 and RAN2 on UE beamlock function (R4-1711823; contact: Keysight)	RAN4	noted	Rel-15	FS_NR_test_methods	RAN5	RAN1, RAN2	R4-1711823
R2-1712140	LS reply to subcarrier alignment (R4-1711859; contact: Huawei)	RAN4	noted	Rel-15	NR_newRAT	RAN1, RAN2		R4-1711859
R2-1712141	LS reply on NR UE baseband capabilities signalling (R4-1711888; contact: Intel)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2	RAN1	R4-1711888
R2-1712142	Reply LS on measurement accuracy improvement (R4-1711893; contact: Huawei)	RAN4	noted	Rel-15	NB_IOTenh2-Core	RAN1	RAN2	R4-1711893

R2-1712143	LS on gaps for SS block measurement in NR (R4-1711940; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT	RAN2	RAN1	R4-1711940
R2-1712144	LS to RAN1 and RAN2 on Definition of synchronous and asynchronous Dual connectivity in Rel-15 LTE-NR combinations (R4-1711965; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN1, RAN2		R4-1711965
R2-1712145	LS on PRB grid in the NR (R4-1711972; contact: Nokia)	RAN4	noted	Rel-14	NR_newRAT-Core	RAN1	RAN2, RAN3	R4-1711972
R2-1712146	LS on no dedicated bearer support over NB-IoT (S2-176723; contact: MediaTek)	SA2	withdrawn	Rel-13	CIoT	RAN5, RAN2, CT1		S2-176723
R2-1712147	Reply LS on MBMS bearer event notification (S2-177582; contact: Ericsson)	SA2	noted	Rel-15	MBMS_Mcservices	SA6, RAN3	RAN2	S2-177582
R2-1712148	LS on FS_REAR SI conclusion (S2-177943; contact: Huawei)	SA2	noted	Rel-15	FS_REAR	RAN, RAN1, RAN2, RAN3, SA3, CT1, SA3-LI		S2-177943
R2-1712149	LS on default values for 5GS QoS averaging window for standardised 5QIs (S2-178049; contact: Qualcomm)	SA2	noted	Rel-15	5GS_Ph1	SA4, RAN2, SA6	CT1	S2-178049
R2-1712150	Reply LS on SDAP header design (S2-178056; contact: MediaTek)	SA2	noted	Rel-15	5GS_Ph1	RAN2		S2-178056
R2-1712151	Reply LS to RAN 2 on QCIs for EPC based ULLC (S2-178150; contact: Vodafone)	SA2	noted	Rel-15	LTE_sTTIandPT, EDCE5, LTE_HRLLC, NR_newRAT-Core	RAN2, RAN3, SA1	RAN1, SA4, CT4	S2-178150
R2-1712152	Reply LS on Certification/License and Identification of Aerial Vehicles (S2-178175; contact: Ericsson)	SA2	noted	Rel-15	FS_LTE_Aerial	RAN2	RAN3, SA3, SA1	S2-178175
R2-1712153	Data support for "voice centric" UE supporting CE mode B (S2-178179; contact: Intel)	SA2	noted	Rel-14	CIoT_Ext	RAN2, RAN3		S2-178179
R2-1712154	Reply LS on Early Data Transmission (S2-178180; contact: Qualcomm)	SA2	noted	Rel-15	LTE_eMTC4-Core, NB_IOTenh2-Core	RAN2, CT1	RAN3, SA3	S2-178180
R2-1712155	LS on the support of Unicast and Groupcast transmission over PC5 for eV2X (S2-178181; contact: LGE)	SA2	noted	Rel-15	LTE_eV2X, FS_eV2XARC	RAN, RAN2	SA, SA1, SA3	S2-178181
R2-1712156	Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity (S2-178182; contact: Qualcomm)	SA2	noted	Rel-15	EDCE5	CT1, SA3	CT4, RAN2, RAN3	S2-178182
R2-1712157	Reply LS on NR Edge Computing (S2-178185; contact: Nokia)	SA2	noted	Rel-15	NR_newRAT	RAN	SA, RAN2, RAN3	S2-178185
R2-1712158	Reply LS on unified Access Control for 5G NR (S2-178191; contact: LGE)	SA2	noted	Rel-15	SMARTER, 5GS_Ph1, 5GS_Ph1-CT	CT1, SA1, RAN2		S2-178191
R2-1712159	LS on adding new service type in QMC reporting (S4-170952; contact: Ericsson)	SA4	noted	Rel-15	LTE_QMC_Streaming, EQoE_MTSI, QOED	RAN2, RAN3, SA5		S4-170952
R2-1712160	LS answer to LS on EUTRAN sharing enhancement (S5-175461; contact: Ericsson)	SA5	noted	Rel-14	TEI14	SA2	RAN2, RAN3, RAN, SA	S5-175461
R2-1712161	Reply LS to LS on supported features by 5GC for E-UTRA connected to 5G CN (S5-	SA5	noted	Rel-15	FS_5GS_Ph1_C H, QOED	RAN2	SA1, SA2, CT1,	S5-175495

	175495; contact: Nokia)						RAN3	
R2-1712298	Reply LS on details of network identifiers (C4-175291; contact: Qualcomm)	CT4	noted	Rel-15	5GS_Ph1-CT	RAN2, SA2		C4-175291
R2-1712299	Reply LS on the number of bearers (C4-175345; contact: Nokia)	CT4	noted	Rel-15	TEI15	SA2	CT1, RAN2, RAN, CT, SA, SA1	C4-175345
R2-1712300	Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity (C4-175349; contact: Ericsson)	CT4	noted	Rel-15	EDCE5	CT1, SA3	SA2, RAN2, RAN3	C4-175349
R2-1713927	Liaison Statement on defining a common value for SPID for Unmanned Aircraft	GSM Association	noted	Rel-15		SA2, RAN2, RAN3		DIG Doc 003 LS to 3GPP on SPID
R2-1713928	Reply LS on short processing time and short TTI (R1-1719223; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT-Core	RAN2		R1-1719223
R2-1713929	LS on RRC parameters for WI on shortened TTI and processing time for LTE (R1-1719231; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT-Core	RAN2		R1-1719231
R2-1713930	LS on maximum TA and processing time for LTE shortened processing time and short TTI (R1-1719238; contact: Nokia)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2, RAN4		R1-1719238
R2-1713931	LS reply on SPS for short TTI (R1-1719248; contact: Huawei)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2		R1-1719248
R2-1713933	Reply LS on default values for 5GS QoS averaging window for standardised 5QIs (S4-171363; contact: Qualcomm)	SA4	noted	Rel-15	5GS_Ph1	SA2, CT1	RAN2, SA6	S4-171363
R2-1713940	LS on RRC parameters for NR (R1-1719250; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1719250
R2-1713952	LS Reply to 3GPP SA2 on Status Icon related to 5G	GSM Association	noted			SA2, RAN2	SA, SA1, RAN, CT1, CT	LS reply to 3GPP SA2 onStatusIcon
R2-1714112	LS on NR Idle Mode procedures (S1-174294; contact: Qualcomm)	SA1	noted	Rel-15	5GS_Ph1-CT	SA2, RAN2, CT1	RAN3	S1-174294
R2-1714113	Reply LS on Certification/License and Identification of Aerial Vehicles (S1-174512; contact: Qualcomm)	SA1	noted	Rel-15	FS_LTE_Aerial	SA2, RAN2	RAN3, SA3, GSMA IoT Drone Interest Group	S1-174512
R2-1714114	Reply LS on QCI for EPC based ULLC (S1-174513; contact: Vodafone)	SA1	noted	Rel-15	NR_newRAT-Core, LTE_HRLLC, LTE_sTTIandPT, EDCE5	SA2, RAN, RAN1	RAN2, RAN3, SA4, CT4	S1-174513
R2-1714120	Reply LS on CR for Reference Signals for MBSFN with 1.25kHz and 7.5kHz sub-carrier spacing (R1-1721431; contact: Intel)	RAN1	noted	Rel-14	MBMS_LTE_enh2-Core	RAN2		R1-1721431
R2-1714137	LS on EDCE5 Algorithm Indication between UE and SgNB (S3-173444; contact: Vodafone)	SA3	noted	Rel-15	EDCE5	CT1, CT4, RAN2, RAN3	SA2	S3-173444
R2-1714140	LS on NR TDD UL/DL configurations and support of HPUE ( R1-1721560; contact: Softbank, Sprint)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN4	RAN2	R1-1721560
R2-1714144	LS on additional agreements for shortened TTI and processing time for LTE (R1-1721216; contact: Ericsson)	RAN1	noted	Rel-15	LTE_sTTIandPT	RAN2		R1-1721216

R2-1714145	LS on NR RMSI TTI (R1-1721557; contact: CATT)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1721557
R2-1714148	Reply LS on RAN2 agreements for enhanced CA utilization WID (R4-1713920; contact: Nokia)	RAN4	noted	Rel-15	LTE_euCA-Core	RAN2		R4-1713920
R2-1714149	LS response on reduced SCell activation time for enhanced CA utilization WID (R4-1713921; contact: Qualcomm)	RAN4	noted	Rel-15	LTE_euCA	RAN2		R4-1713921
R2-1714151	LS on wake-up signal (R1-1721241; contact: HiSilicon)	RAN1	noted	Rel-16	NB_IOTenh2-Core	RAN2, RAN4		R1-1721241
R2-1714155	LS on required information for NSA on X2 (R3-174964; contact: Nokia)	RAN3	noted	Rel-15	NR_newRAT-Core	RAN1, RAN2, RAN4		R3-174964
R2-1714156	LS on early data transmission (R1-1721255; contact: Huawei)	RAN1	noted	Rel-15	NB_IOTenh2-Core, LTE_eMTC4-Core	RAN2		R1-1721255
R2-1714161	Reply LS on SPS and Grant-free (R1-1721574; contact: NTT DOCOMO)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1721574
R2-1714162	LS on RAN1 agreement on UL power sharing for LTE/NR NSA operation (R1-1721606; contact: Intel)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1721606
R2-1714164	LS on RRC parameters for NR (R1-1721616; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1721616
R2-1714167	Reply LS on maximum data rate of user plane integrity protected data (S3-173420; contact: Qualcomm)	SA3	noted	Rel-15	NR_newRAT-Core	RAN2	SA2, RAN3	S3-173420
R2-1714168	LS on Wake-up signal features for Rel-15 LTE-MTC (R1-1721282; contact: Ericsson)	RAN1	noted	Rel-15	LTE_eMTC4	RAN2		R1-1721282
R2-1714171	LS reply on support of Trace and MDT in NG-RAN in rel-15 (S5-176477; contact: Nokia)	SA5	noted	Rel-15	NR_newRAT-Core	RAN3, CT4	RAN2	S5-176477
R2-1714180	Reply LS on the number of bearers (S2-179536; contact: Samsung)	SA2	noted	Rel-15	TEI15	RAN2, CT1, CT4, RAN, SA, CT	SA1	S2-179536
R2-1714189	LS on SRS PHR reporting (R1-1721680; contact: Huawei)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1721680
R2-1714201	LS reply on SSTD measurements for EN-DC (R4-1714289; contact: Ericsson)	RAN4	noted	Rel-15	NR_newRAT-Core	RAN2, RAN1		R4-1714289
R2-1714202	LS on correction of interference in NB-IoT RACH procedure (R1-1721302; contact: Huawei)	RAN1	noted	Rel-14	NB_IOTenh-Core	RAN2		R1-1721302
R2-1714209	LS to RAN2 on the occasion of their centenary meeting (R4-1714481; contact: James Clerk Maxwell)	RAN4	rejected			RAN2		R4-1714481
R2-1714236	LS on MAC CE parameters for NR MIMO (R1-1721663; contact: NTT DOCOMO)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1721663
R2-1714247	LS on RAN1 Conclusions and TPs approved in RAN1#91 (R1-1721310; contact: Ericsson)	RAN1	noted	Rel-15	FS_LTE_Aerial	RAN2		R1-1721310

97 incoming LS, of which 96 were noted. One LS was withdrawn (was treated already in the previous meeting).

## Annex D: Outgoing liaison statements

TDoc	Title	Release	Related WIs	To	Cc
R2-1713999	Reply LS on Issue with handovers in eMTC	Rel	LTE_MTCe2_L1-Core	RAN1	
R2-1714008	Reply LS to RAN1 on wake-up signal	Rel-13	NB_IOTenh2-Core, LTE_eMTC4-Core	RAN1	
R2-1714013	Reply LS on unified Access Control for 5G NR	Rel-15	NR_newRAT-Core	SA1	CT1, SA2, CT6
R2-1714015	Reply LS on System acquisition time reduction for Rel-15 LTE MTC	Rel-15	LTE_eMTC4-Core	RAN1, RAN4	
R2-1714049	LS on BWP related agreements	Rel-15	NR_newRAT-Core	RAN1	
R2-1714050	LS to RAN1 on beam recovery failure	Rel-15	NR_newRAT-Core	RAN1	
R2-1714061	LS to RAN1 on HARQ agreements	Rel-15	NR_newRAT-Core	RAN1	
R2-1714062	LS to RAN1 on GF/SPS agreements	Rel-15	NR_newRAT-Core	RAN1	
R2-1714070	LS on VoIP packet sizes and transport blocks	Rel-15	NR_newRAT-Core	RAN1	
R2-1714074	LS on PHR mapping table for FR1 and FR2	Rel-15	NR_newRAT-Core	RAN4	
R2-1714121	Reply LS on LTE call redirection to GERAN	Rel-15	TEI14	CT1	SA3, RAN3
R2-1714124	Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity	Rel-14	NR_newRAT-Core, EDCE5	SA2, CT1, SA3	CT4, RAN3
R2-1714125	LS on maximum data rate of user plane integrity protected data	Rel-15	NR_newRAT-Core	SA3	SA2
R2-1714129	LS on TDM pattern coordination for single UL operation	Rel-15	NR_newRAT-Core	RAN3	
R2-1714136	Reply LS on QCLs for EPC based ULLC	Rel-15	NR_newRAT-Core	SA2	
R2-1714154	Reply LS on Supportable RNTI Length on DCI	Rel-15	NR_newRAT-Core	RAN1	
R2-1714169	LS on replacement of "SCG change indication" with "PDCP change indication"	Rel-15	NR_newRAT-Core	RAN3	
R2-1714186	LS on LTE Control Plane Latency Reduction	Rel-15	TEI15	RAN1	RAN
R2-1714187	LS on Reliability for eV2X	Rel-15	LTE_eV2X-Core	SA2	CT1
R2-1714203	Reply LS on supported features by 5GC for E-UTRA connected to 5G CN	Rel-15	LTE_5GCN_connect-Core	SA5	SA1, SA2, CT1, RAN3
R2-1714205	LS on cells not broadcasting SIB1	Rel-15	NR_newRAT-Core	RAN1	
R2-1714227	LS on LTE measurement gap patterns for SSTD measurement	Rel-15	NR_newRAT-Core	RAN4	
R2-1714239	LS about LTE CA SCell New State agreements	Rel-15	LTE_euCA-Core	RAN1, RAN4	RAN
R2-1714244	LS on Security aspects of supporting LTE connected to 5GC	Rel-15	LTE_5GCN_connect-Core	SA3	CT1
R2-1714245	Reply LS on LS on default values for 5GS QoS averaging window for standardised 5QIs	Rel-15	NR_newRAT-Core	SA2	SA4, SA6, CT1
R2-1714246	LS on MAC CEs for beam management and CSI	Rel-15	NR_newRAT-Core	RAN1	
R2-1714248	Reply LS on Certification/License and Identification of Aerial Vehicles	Rel-15	FS_LTE_Aerial	SA2, SA1, RAN3	
R2-1714258	LS on Rel-15 NB-IoT work progress	Rel-15	NB_IOTenh2	RAN	
R2-1714263	LS on UE capability clarification for simultaneousRxTx for NR	Rel-15	NR_newRAT-Core	RAN4	

29 outgoing LS.

## Annex E: List of agreed CRs

Agreed CRs:

TDoc	Title	Source	Rel	Spec	Related WIs	CR	Rev	Cat
R2-1712235	UE capability for support of SRS enhancements without support of comb 4	Qualcomm Incorporated, Ericsson	Rel-14	36.331	LTE_feMTC-Core	3127		F
R2-1712236	UE capability for support of SRS enhancements without support of comb 4	Qualcomm Incorporated, Ericsson	Rel-14	36.306	LTE_feMTC-Core	1514		F
R2-1712289	Define requirement for reception of number of simultaneous SC-PTM services	Qualcomm Incorporated	Rel-14	36.331	LTE_SC_PTM-Core	3108	1	A
R2-1712327	Correction on SRS switching capabilities field description	Qualcomm Incorporated	Rel-14	36.331	LTE_SRS_switch	3088	1	F
R2-1712556	Introduction of the temporary UE capability for overheating indication	Huawei Device, Huawei, HiSilicon, ICom, Nokia, Nokia Shanghai Bell	Rel-14	36.306	TEI14	1490	5	B
R2-1712558	Correction on SubframeBitmap Configuration in Band 47	Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	3085	2	F
R2-1712705	Introduction of QoE Measurement Collection for LTE	Huawei, HiSilicon	Rel-15	36.300	LTE_QMC_Streaming-Core	1073		B
R2-1712706	Introduction of QoE Measurement Collection for LTE	Huawei, HiSilicon	Rel-15	36.306	LTE_QMC_Streaming-Core	1519		B
R2-1712707	Introduction of QoE Measurement Collection for LTE	Huawei, HiSilicon	Rel-15	36.331	LTE_QMC_Streaming-Core	3144		B
R2-1712741	Corrections to V2X in TS 36.300	Huawei, HiSilicon	Rel-14	36.300	LTE_V2X-Core	1062	3	F
R2-1712954	Correction to RLC UM for LWA	Ericsson	Rel-14	36.323	LTE_WLAN_aggr-Core	0210		F
R2-1713039	Removal of FFS for RAI in 36.321	Ericsson	Rel-14	36.321	NB_IOTenh-Core	1186	1	F
R2-1713040	Clarification on Interference Randomisation in NB-IoT in 36.331	Ericsson, Qualcomm Incorporated	Rel-14	36.331	NB_IOTenh-Core	3090	2	F
R2-1713081	MUST capability	MediaTek Inc.	Rel-14	36.331	LTE_MUST-Core	3091	1	F
R2-1713094	Correction to description of uplink and downlink shared channel physical layer model for MTC and NB-IoT.	Huawei, HiSilicon	Rel-13	36.302	LTE_MTCe2_L1-Core, NB_IOT-Core	0116	2	F
R2-1713095	Correction to description of uplink and downlink shared channel physical layer model for MTC and NB-IoT.	Huawei, HiSilicon	Rel-14	36.302	LTE_MTCe2_L1-Core, NB_IOT-Core	0117	1	A
R2-1713098	Correction on TS 36.300 for support of larger maximum PDSCH/PUSCH channel bandwidth for feMTC	Huawei, HiSilicon	Rel-14	36.300	LTE_feMTC-Core	1066	1	F
R2-1713128	MUST capability	MediaTek Inc.	Rel-14	36.306	LTE_MUST-Core	1533		F
R2-1713222	Corrections on paging monitoring in RRC_CONNECTED in Rel-13 eMTC	Huawei, HiSilicon	Rel-13	36.300	LTE_MTCe2_L1-Core	1054	3	F
R2-1713225	Minor correction on the IE of pusch-EnhancementsConfig in feMTC	Huawei, HiSilicon	Rel-14	36.321	LTE_feMTC-Core	1187	1	F
R2-1713377	Correction on zone configuration in transmission pool selection	Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	3184		F
R2-1713413	Correction to UE capabilities	Nokia, Nokia Shanghai Bell	Rel-14	36.331	LTE_V2X-Core	3107	2	F
R2-1713540	DCI monitoring subframes for eIMTA	Huawei, HiSilicon	Rel-12	36.331	LTE_TDD_eIMTA-Core	3188		F
R2-1713542	DCI monitoring subframes for eIMTA	Huawei, HiSilicon	Rel-13	36.331	LTE_TDD_eIMTA-Core	3189		A
R2-1713545	DCI monitoring subframes for eIMTA	Huawei, HiSilicon	Rel-14	36.331	LTE_TDD_eIMTA-Core	3190		A
R2-1713566	Signaling of NCSG Support for Inter-F Measurement	Qualcomm Incorporated, Ericsson, Nokia	Rel-14	36.331	LTE_meas_gap_enh-Core	3110	3	B
R2-1713624	Alignment of FGI4 (Short DRX) for Cat M1	Ericsson	Rel-13	36.331	LTE_MTCe2_L1-Core	3119	1	F
R2-1713625	Alignment of FGI4 (Short DRX) for Cat M1 and M2	Ericsson	Rel-14	36.331	LTE_MTCe2_L1-Core	3120	1	F
R2-1713664	SFN desynchronization between eNB and eDRX UE	NTT DOCOMO INC.	Rel-14	36.331	LTE_extDRX-Core	3194		F
R2-1713817	Corrections to V2X functionality	LG Electronics Inc.	Rel-14	36.321	LTE_V2X-Core	1190	2	F
R2-1713960	Clarification on eDRX in NB-IoT	Nokia	Rel-13	36.304	NB_IOT-Core, LTE_extDRX-Core	0398	1	F
R2-1713961	Clarification on eDRX in NB-IoT	Nokia	Rel-14	36.304	NB_IOT-Core, LTE_extDRX-Core	0399	1	A
R2-1713962	Small corrections to CarrierConfigDedicated, T322 and t-reordering default configuration	Huawei, HiSilicon	Rel-14	36.331	NB_IOTenh-Core	3175	1	F
R2-1713963	Corrections on paging monitoring in RRC_CONNECTED in Rel-13 eMTC	Huawei, HiSilicon	Rel-13	36.331	LTE_MTCe2_L1-Core	3045	4	F
R2-1713964	Corrections on paging monitoring in RRC_CONNECTED in Rel-13 eMTC	Huawei, HiSilicon	Rel-14	36.331	LTE_MTCe2_L1-Core	3046	3	A

R2-1713965	Corrections on paging monitoring in RRC_CONNECTED in Rel-13 eMTC	Huawei, HiSilicon	Rel-14	36.300	LTE_MTCe2_L1-Core	1055	4	A
R2-1713967	Introducing a definition for the term UE in CE	Intel Corporation, Ericsson, Huawei, HiSilicon, LG	Rel-13	36.331	LTE_MTCe2_L1-Core	3139	1	F
R2-1713968	Introducing a definition for the term UE in CE	Intel Corporation, Ericsson, Huawei, HiSilicon, LG	Rel-14	36.331	LTE_MTCe2_L1-Core	3140	1	A
R2-1713969	Correction to cell barring for coverage enhancement	Huawei, HiSilicon, Intel Corporation	Rel-13	36.304	LTE_MTCe2_L1-Core	0396	1	F
R2-1713974	TM6 capabilities in CE mode	Ericsson, Sequans, Qualcomm Incorporated	Rel-13	36.306	LTE_MTCe2_L1-Core	1527	1	F
R2-1713975	TM6 capabilities in CE mode	Ericsson, Sequans, Qualcomm Incorporated	Rel-14	36.306	LTE_MTCe2_L1-Core	1528	1	A
R2-1713976	TM6 capabilities in CE mode	Ericsson, Sequans, Qualcomm Incorporated	Rel-13	36.331	LTE_MTCe2_L1-Core	3159	1	F
R2-1713977	TM6 capabilities in CE mode	Ericsson, Sequans, Qualcomm Incorporated	Rel-14	36.331	LTE_MTCe2_L1-Core	3160	1	A
R2-1713978	Target cell optional PBCH repetition status indication	Qualcomm Incorporated	Rel-14	36.331	LTE_feMTC-Core	3037	4	F
R2-1713980	Correction on the field description of ce-PDSCH-TenProcesses	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core	3169	1	F
R2-1713981	Clarification on srs-UpPtsAdd in SRS coverage enhancement	Intel Corporation	Rel-14	36.331	LTE_feMTC-Core	3137	1	F
R2-1713982	Scheduling information of SIB1-BR when skipping MIB during HO	Intel Corporation	Rel-14	36.331	LTE_feMTC-Core	3138	1	F
R2-1713984	Correction on PRS hopping configuration	Huawei, HiSilicon	Rel-14	36.355	LTE_feMTC-Core	0187	2	F
R2-1713985	MBSFN subframes for target cell during handover to CE cell	Qualcomm Incorporated	Rel-13	36.331	LTE_MTCe2_L1-Core	3128	1	F
R2-1713986	MBSFN subframes for target cell during handover to CE cell	Qualcomm Incorporated	Rel-14	36.331	LTE_MTCe2_L1-Core	3129	1	F
R2-1713991	Correction on downlink reception type combination for SC-PTM in feMTC	Huawei, HiSilicon	Rel-14	36.302	LTE_feMTC-Core	0115	3	F
R2-1713994	Successful acknowledgement of RRCConnectionRelease	Ericsson, Huawei, HiSilicon	Rel-14	36.331	NB_IOTenh-Core	3157	1	F
R2-1713997	Corrections on field description of cellSelectionInfoCE for eMTC	Huawei, HiSilicon, CMCC	Rel-13	36.331	LTE_MTCe2_L1-Core	3095	5	F
R2-1713998	Corrections on field description of cellSelectionInfoCE for eMTC	Huawei, HiSilicon, CMCC	Rel-14	36.331	LTE_MTCe2_L1-Core	3096	4	A
R2-1714000	Correction to UE-Capability-NB extension and provision for late rel-13 corrections	Sequans Communications	Rel-14	36.331	NB_IOTenh-Core	3113	4	F
R2-1714002	Introduction of relaxed monitoring in NB-IoT	Ericsson, Huawei, HiSilicon, LG Electronics	Rel-14	36.304	NB_IOTenh-Core, TEI14	0392	2	C
R2-1714003	Introduction of relaxed monitoring in NB-IoT	Ericsson, Huawei, HiSilicon, LG Electronics	Rel-14	36.306	NB_IOTenh-Core, TEI14	1523	2	C
R2-1714007	Clarification on carrier index in PDCCH order	Huawei, HiSilicon	Rel-14	36.321	NB_IOTenh-Core	1188	4	F
R2-1714009	Introduction of the overheating indication	Huawei Device, Huawei, HiSilicon, IPCom, Nokia, Nokia Shanghai Bell, MediaTek	Rel-14	36.300	TEI14	1048	7	B
R2-1714010	Introduction of the overheating indication	Huawei Device, Huawei, HiSilicon, IPCom, MediaTek	Rel-14	36.331	TEI14	2982	8	B
R2-1714036	UE capabilities for Tx antenna selection	Qualcomm Incorporated, Ericsson, SoftBank	Rel-13	36.331	LTE_CA_TDD_FDD-Core	3080	3	F
R2-1714037	UE capabilities for Tx antenna selection	Qualcomm Incorporated, Ericsson, SoftBank	Rel-13	36.306	LTE_CA_TDD_FDD-Core	1510	3	F
R2-1714038	Table 8.2-2 correction of the remarks for DL reception type of Sidelink and FeMBMS and move of EPDCCH remark to the bottom of the table	Ericsson	Rel-14	36.302	TEI14	1191	1	F
R2-1714040	Introduction of a new UE capability for	CMCC	Rel-14	36.306	LTE_UL_CAP_enh-Core	1536	1	B



	ssp10 with less CRS							
R2-1714041	Introduction of a new configuration for ssp10 with less CRS	CMCC	Rel-14	36.331	LTE_UL_CAP_enh-Core	3180	1	B
R2-1714042	Introduction of Enhanced CRS and SU-MIMO Interference Mitigation Performance Requirements for LTE	Intel Corporation	Rel-14	36.306	LTE_eCRSIM_eSUMIMO	1518	1	B
R2-1714051	Correction to V2X descriptions in TS 36.302	Huawei, Ericsson, OPPO, HiSilicon	Rel-14	36.302	LTE_V2X-Core	0114	2	F
R2-1714053	Clarification to Mapping Between Service Types and V2X Frequencies	Ericsson	Rel-14	36.300	LTE_V2X-Core	1083	1	F
R2-1714054	Clarification on csi-RS-ConfigNZPId	Qualcomm Incorporated, Ericsson	Rel-13	36.331	LTE_EBF_FDMIMO-Core	3111	2	F
R2-1714055	Clarification on csi-RS-ConfigNZPId	Qualcomm Incorporated, Ericsson	Rel-14	36.331	LTE_EBF_FDMIMO-Core	3112	2	A
R2-1714064	Correction to Inter-frequency reception for V2X sidelink communication	Huawei, HiSilicon	Rel-14	36.331	LTE_V2X-Core	3072	3	F
R2-1714065	Transmission of P2X sidelink communication in Exceptional Pool	Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	3084	3	F
R2-1714066	EN-DC impacts to LTE RLC	Huawei, HiSilicon	Rel-15	36.322	NR_newRAT-Core	0132	1	B
R2-1714072	EN-DC impacts to LTE MAC	Huawei, HiSilicon, Apple	Rel-15	36.321	NR_newRAT-Core	1196	2	B
R2-1714142	Introducing support for NR, changes relevant for NSA	Samsung Telecommunications	Rel-15	36.331	NR_newRAT-Core	3115	3	B
R2-1714175	Correction to UE-Capability-NB extension and provision for late rel-13 corrections	Sequans Communications	Rel-13	36.331	NB_IOT-Core	3201		F
R2-1714177	Clarification on averaging window for RAN assisted codec rate adaptation	Qualcomm Incorporated	Rel-14	36.321	LTE_VoLTE_ViLTE_enh	1202	1	F
R2-1714179	Introduction of assistance information for local cache	CMCC, Intel Corporation	Rel-15	36.300	LTE_ViLTE_enh2-Core	1076	2	B
R2-1714210	Introduction of relaxed monitoring in NB-IoT	Ericsson, Huawei, HiSilicon, LG Electronics	Rel-14	36.331	NB_IOTenh-Core, TEI14	3154	3	C
R2-1714211	CR on SIB21 reading	OPPO, Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	3073	4	F
R2-1714212	Define requirement for reception of number of simultaneous SC-PTM services	Qualcomm Incorporated	Rel-13	36.331	LTE_SC_PTM-Core	3106	3	F
R2-1714213	Cleaning up CQI and CSI-RS-related configurations (related to Rel-14 ASN.1 review issue N.099)	Nokia, Nokia Shanghai Bell	Rel-14	36.331	TEI14	2968	5	F
R2-1714214	Deliver stored PDCP SDUs for LWA bearer with RLC UM at PDCP re-establishment	LG Electronics	Rel-14	36.323	LTE_WLAN_aggr-Core	0216	1	F
R2-1714215	Correction to cell barring for coverage enhancement	Huawei, HiSilicon, Intel Corporation	Rel-14	36.304	LTE_MTCe2_L1-Core	0397	2	A
R2-1714216	Correction to actions related to InterFreqRSTDMeasurementIndication message	Qualcomm Incorporated	Rel-14	36.331	LTE_feMTC-Core	3135	2	F
R2-1714240	UE capabilities for Tx antenna selection	Qualcomm Incorporated, Ericsson, SoftBank	Rel-14	36.331	LTE_CA_TDD_FDD-Core	3081	2	A
R2-1714241	UE capabilities for Tx antenna selection	Qualcomm Incorporated, Ericsson, SoftBank	Rel-14	36.306	LTE_CA_TDD_FDD-Core	1511	2	A
R2-1714249	Clarifications CR	Huawei, HiSilicon, ITL	Rel-15	36.746	FS_feD2D_loT_relay_wearable	0002	3	F
R2-1714250	NRS-CRS power offset configuration for NB-IoT	ZTE Corporation, Sanechips	Rel-14	36.331	NB_IOTenh-Core	3153	2	F
R2-1714254	Correction to random access power control in 36.306	Huawei, HiSilicon	Rel-14	36.306	NB_IOTenh-Core	1534	1	F
R2-1714255	Correction to random access power control in 36.321	Huawei, HiSilicon	Rel-14	36.321	NB_IOTenh-Core	1199	1	F
R2-1714256	Correction to random access power control in 36.331	Huawei, HiSilicon	Rel-14	36.331	NB_IOTenh-Core	3176	1	F
R2-1714264	Change to actions upon mac-ContentionResolutionTimer expiry for FeMTC and eNB-IoT	Nokia, Nokia Shanghai Bell	Rel-14	36.321	LTE_feMTC-Core, NB_IOTenh-Core	1194	2	F
R2-1714265	Introduction of shortened TTI and processing time for LTE	Ericsson	Rel-15	36.331	LTE_sTTIandPT-Core	3202		B
R2-1714266	Introduction of shortened TTI and	Ericsson	Rel-15	36.321	LTE_sTTIandPT-Core	1203		B

	processing time for LTE							
R2-1714267	Introduction of shortened TTI and processing time for LTE	Ericsson	Rel-15	36.306	LTE_sTTIandPT-Core	1542		B
R2-1714268	Introduction of shortened TTI and processing time for LTE	Ericsson	Rel-15	36.302	LTE_sTTIandPT-Core	1192		B
R2-1714269	Introduction of shortened TTI and processing time for LTE	Ericsson	Rel-15	36.300	LTE_sTTIandPT-Core	1084		B
R2-1714274	Protection of Redirection to GERAN	RAN3 (Nokia, Nokia Shanghai Bell)	Rel-14	36.300	TEI14	1085		F
R2-1714280	Baseline CR for Rel.15 NR (RAN3 part)	RAN3 (Nokia, Nokia Shanghai Bell, ZTE)	Rel-15	36.300	NR_newRAT-Core	1086	1	B
R2-1714281	Introduction of assistance information for local cache	CMCC, Intel Corporation	Rel-15	36.306	LTE_ViLTE_enh2-Core	1535	2	B
R2-1714282	Introduction of assistance information for local cache	CMCC, Intel Corporation	Rel-15	36.323	LTE_ViLTE_enh2-Core	0211	2	B
R2-1714283	Introduction of assistance information for local cache	CMCC, Intel Corporation	Rel-15	36.331	LTE_ViLTE_enh2-Core	3178	2	B
R2-1714284	Reject of unprotected redirect to GERAN	Ericsson	Rel-14	36.331	TEI14	3132	3	C

104 agreed CRs.

## Annex F: Email Approvals

Deadline Thursday, 2017-12-07, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already allocated

[100#01][NR] LS to RAN4 on simultaneous RXTX for inter-band TDD/TDD and inter-band FDD/TDD (Intel)

Intended outcome: Approved LS  
 Deadline: Thursday 2017-12-07  
 => Approved in R2-1714263.

[100#02][LTE/euCA] LS to RAN1/RAN4 on SCell fast activation (Qualcomm)

Intended outcome: Approved LS  
 Deadline: Thursday 2017-12-07  
 => Approved in R2-1714239.

[100#03][LTE/V2X] – Correction on zone configuration – Qualcomm

- Confirm the earth model used, WGS84  
 Intended outcome: Agreed CR  
 Deadline: Thursday 2017-12-07  
 => The CR is agreed in R2-1713377.

[100#04][LTE/sTTI] – 36.331 – Ericsson

- CR capturing all RAN2 agreements for sTTI  
 Intended outcome: Agreed CR  
 Deadline: Thursday 2017-12-07  
 => The CR is agreed in R2-1714265.

[100#05][LTE/sTTI] – 36.321 – Ericsson

- CR capturing all RAN2 agreements for sTTI  
 Intended outcome: Agreed CR  
 Deadline: Thursday 2017-12-07  
 => The CR is agreed in R2-1714266.

[100#06][LTE/sTTI] – 36.306 – Ericsson

- CR capturing all RAN2 agreements for sTTI  
Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> The CR is agreed in R2-1714267.

[100#07][LTE/sTTI] – 36.302 – Ericsson

- CR capturing all RAN2 agreements for sTTI  
Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> This CR is agreed in R2-1714268.

[100#08][LTE/sTTI] – 36.300 – Ericsson

- CR capturing all RAN2 agreements for sTTI  
Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> This CR is agreed in R2-1714269.

[100#09][LTE/UAV]TR 36.777(DCM)

- All endorsed TPs from RAN2 and RAN1 should be merged into the TR  
Intended outcome: Agreed TR for submission to RAN for approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714276 (v0.5.0)

[100#10][NB-IoT R15] Running Rel-15 36.331 CR for NB-IoT and LS to RP (Huawei)

- Intended outcome: Endorsed running CR and approved LS  
Deadline: Thursday 2017-12-07  
=> The running CR is endorsed in R2-1714272, the LS is approved in R2-1714258

[100#11][NB-IoT R15] Running Rel-15 36.321 CR for NB-IoT (Ericsson)

- Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-07  
=> Endorsed as a running CR in R2-1714262

[100#12][NB-IoT R14] NRS-CRS power offset configuration (ZTE)

- Mainly to check R1-R2 consistency  
Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> This CR is agreed in R2-1714250.

[100#13][NB-IoT R14] Interference in RACH procedure CR (Huawei)

- Interference in RACH procedure, CR approval 1 week (revisions of R2-1713218, 19, 20),  
update CRs based on R1 LS  
Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> The CRs are agreed in R2-1714254, R2-1714255, R2-1714256.

[100#14][NB-IoT/MTC R14] Contention Resolution Timer (Nokia)

- Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> The CR is agreed in R2-1714264.

[100#15][NR] 36.800 (Nokia)

- Intended outcome: Agreed TS for submission to RAN for approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714252.

[100#16][NR] 37.340 (ZTE)

Intended outcome: Agreed TS for submission to RAN for approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714251.

[100#17][NR] 38.331 (Ericsson)

Intended outcome: Agreed TS for submission to RAN for (one step) approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714259.

[100#44][NR] 36.331 CR (Samsung)

Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-07  
=> The CR is agreed in R2-1714142.

[100#18][NR] 38.306 and UE capability ASN.1 (Intel)

Updated draft TS to capture agreements from this meeting  
Intended outcome: Agreed TS for submission to RAN for (one step) approval, and agreed ASN.1 for inclusion into 38.331  
Deadline: Thursday 2017-12-07  
=> Agreed: R2-1714270: The TP on UE capabilities  
R2-1714271: 38.306, v0.1.0

[100#19][NR] L2 parameters ASN.1(Huawei)

Intended outcome: Agreed TP to be incorporated into 38.331  
Deadline: Thursday 2017-12-07  
=> The TP is agreed in R3-1714277

[100#20][NR UP/MAC] – 38.321 – Samsung

- Running TS capturing agreed TPs and all new agreements  
Intended outcome: Agreed TS for submission to RAN for approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714253.

[100#21][NR UP/RLC] – 38.322 – Mediatek

- Running TS capturing agreed TPs and all new agreements  
Intended outcome: Agreed TS for submission to RAN for approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714261.

[100#22][NR UP/PDCP] – 38.323 – LG

- Running TS capturing agreed TPs and all new agreements  
Intended outcome: Agreed TS for submission to RAN for approval  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714273

[100#23][NR UP/MAC] – TP on SPS/GF - Nokia

- agreeable TP to be merged in main  
Intended outcome: Agreed TP  
Deadline: Thursday 2017-12-06 (note earlier deadline to enable merge into MAC TS)  
=> The TP is agreed in R2-1714058.

[100#43][LTE/ViLTE] Assistance information for local cache CRs to 36.331, 36.323 and 36.306 - CMCC  
Use R2-1714159, R2-1714160, R2-1714158 as baseline

Intended outcome: Agreed CRs  
Deadline: Thursday 2017-12-07  
=> Agreed in R2-1714281/82/83 (36.306 / 36.323 / 36.331)

[100#45][LTE/feD2D] Agree in principle agreed CR from RAN2#99bis

- Provide the in principle agreed CR from RAN2#99bis in R2-1711862 to this email discussion for agreement.

Intended outcome: Agreed CR  
Deadline: Thursday 2017-12-06  
=> Agreed in R2-1714249.

## Deadline Thursday, 2017-12-14, 23:59 Pacific Time

**Please request TDoc numbers for the following email discussions from MCC if not already allocated**

[100#24][LTE/5GC] 36.331 running CR (Intel)

Update with agreements from this meeting  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14  
=> Endorsed in R2-1714286

[100#25][LTE/5GC] 36.300 running CR (Huawei)

Update with agreements from this meeting  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14  
=> Endorsed in R2-1714285

[100#26][LTE/UDC] Running 36.323 CR (CATT)

- Update the running CR according to the agreements from this meeting

Intended outcome: endorsed running CR  
Deadline: Thursday 2017-12-14  
=> Endorsed in R2-1714278

[100#27][LTE/UDC] Running 36.331 CR (CATT)

- Update the running CR according to the agreements from this meeting

Intended outcome: endorsed running CR  
Deadline: Thursday 2017-12-14  
=> Endorsed in R2-1714279

[100#28][LTE/euCA] Running stage-2 CR for euCA (Nokia)

Capture related the agreements from this meeting and the previous meetings.  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14  
=> Endorsed in R2-1714289

[100#29][LTE/euCA] Running stage-3 CR for euCA (Nokia)

Capture related the agreements from this meeting and the previous meetings.  
Intended outcome: Endorsed running CR  
Deadline: Thursday 2017-12-14  
=> Endorsed in R2-1714287 (RRC) and R2-1714288 (MAC)

## Deadline Thursday, 2018-01-11, 23:59 Pacific Time

**TDoc numbers for the following email discussions may be requested via 3GU tool**

[100#30][NR] L1 CSI meas config (Ericsson)

Progress details of L1 parameters related to CSI meas config

Intended outcome: Report to next meeting  
Deadline: Thursday 2018-01-11

[100#31][NR] Inter-Node RRC message (Samsung)

Continue to progress the content of inter-node RRC messages. To also consider the LS from RAN3

Intended outcome: TP/CR and report describing the FFS points that need to be discussed online at the next meeting  
Deadline: Thursday 2017-01-11

[100#32][NR] UE capabilities (Qualcomm)

To discuss whether the linking to BPC should be included in the MRDC BCs and how to address the new information from RAN4 about MIMO capability and intra-band non-contiguous CA in relation to carrier separation.

Intended outcome: Report to AH meeting  
Deadline: Thursday 2017-01-11

[100#33][NR] L2 buffer size (Intel)

Progress the details of the L2 buffer size calculation based on proposals 1 and 2 of R2-1714200

Intended outcome: Report to next meeting  
Deadline: Thursday 2018-01-11

[100#34][NR] L2 parameter FFSs (Huawei)

Progress FFS points to next meeting  
Intended outcome: Report to next meeting  
Deadline: Thursday 2018-01-11

## Deadline Thursday, 2018-02-08, 23:59 Pacific Time

**TDoc numbers for the following email discussions may be requested via 3GU tool**

[100#35][LTE/TEI15] New L2 measurements (Huawei)

- Identify the solution to address SA5 requirement  
Intended outcome: agreeable CR if needed  
Deadline: Thursday 2018-02-08

[100#36][LTE/euCA] Solutions on signalling overhead reduction (Nokia)

Try to have a unified solution based on the contributions so far.  
Intended outcome: Report to the next meeting  
Deadline: Thursday 2018-02-08

[100#37][NB-IoT R14] Measurement Report for NB-IoT (CMCC)

Measurement Report for NB-IoT, what could be the possible solution(s), which release, pave the way for decisions,  
Intended outcome: Report to next meeting  
Deadline: Thursday 2017-02-08

[100#38][MTC Rel-15] padding issue in Msg3 [Ericsson]

On how to address the padding issue in Msg3  
Intended outcome: Report to next meeting  
Deadline: Thursday 2017-02-08

[100#39][MTC R15] 36.331 CR [Qualcomm]

Intention: to progress the running 36.331 CR for eMTC to capture the Rel-15 agreement

Intended outcome: Running CR submitted next meeting  
Deadline: Thursday 2017-02-08

[100#40][MTC R15] 36.321 CR [Intel]

To progress the running 36.321 CR for eMTC to capture the Rel-15 agreement  
Intended outcome: Running CR submitted next meeting  
Deadline: Thursday 2017-02-08

[100#41][LTE – eV2X] TX carrier selection – LG

- Identify the list of solutions by using PPPP and CBR in the TX carrier selection (based on the contributions this meeting)
- Analyze pros and cons
- Select the best option / the most preferred option

Intended outcome: Report to next meeting  
Deadline: Thursday 2017-02-08

[100#42][LTE – eV2X] Radio resource pool sharing – OPPO

- Identify possible scenarios
- Clarify which scenario we'll take into account for the solution
- Pool configurations with pool sharing
- Possible solutions (RAN2 based one)

Intended outcome: Report to next meeting  
Deadline: Thursday 2017-02-08

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## Annex G: History

Document history		
Date	TSG RAN WG2 Tdoc	Subject
18.12.2017	-	Draft report v1
13.02.2018		Draft report v2 (adding the results for email discussions #24-29)
14.02.2018	R2-1801701	Version submitted for approval in RAN2#101
Author: <b>Dr. Juha Korhonen</b> ETSI Mobile Competence Centre (MCC) Tel. +33 (0)4 92 94 42 00 email: Juha.Korhonen@etsi.org		

# **APPENDIX E**



Agenda Item: 10.4.1.3.1

Source: Ericsson

Title: OFFLINE#22 LTE re-establishment and resume while using NR PDCP  
(Ericsson)

Document for: Discussion, Decision

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## 1 Introduction

The issue of LTE re-establishment in case NR PDCP was configured for some bearers (either in EN-DC or standalone LTE) was discussed, and the outcome was:

- [R2-1713388](#) LTE re-establishment when using NR PDCP (TP to 36.331 and 38.331) Ericsson discussion Rel-15 NR\_newRAT-Core
- Lenovo think this reduces the chances to successfully re-establishment. Ericsson think in this case it would result in extra reconfiguration when the cell does support NR PDCP.
  - IDC think the common case is reestablishment to a cell that does support NR PDCP.
  - Intel wonder why reject is needed and full configuration is not used.
  - HTC think that full configuration is not possible in the re-establishment , it can only be done in the first reconfiguration.
  - OPPO think this proposal has some benefit when the cell supports EN-DC.
- ⇒ Offline discussion to progress the SRB1 issue to ensure that the mechanism works when the UE attempts to re-establish on an eNB that supports EN-DC, and when the UE attempts to re-establish on a legacy eNB that has the context but can not understand the full context. (Offline discussion #22, Ericsson)

### Agreements

- 1 For re-establishment in LTE, UE releases the lower layer SCG configuration (i.e. nr-secondaryCellGroupConfig) at RRC re-establishment while the DRB configuration (incl. the NR PDCP configuration received in radioBearerConfig) is kept.

The issue of NR PDCP version preservation during LTE suspend/resume was also discussed:

- [R2-1713399](#) Discussion and TP on preserving NR PDCP version Ericsson discussion Rel-15 NR\_newRAT-Core
- OPPO think this should be discussed together with re-establishment. Samsung have the same view.
  - Ericsson think this case is different as an additional reconfiguration is not always needed but if we change to LTE PDCP then an extra reconfiguration step will be needed
  - Intel think this case has the same issue with legacy eNBs as the re-establishment.
  - LG think this requires that all cells in the resume area will have to support NE-DC and NR PDCP.
- ⇒ Can be discussed within the scope of offline discussion #22

The purpose of this offline is:

- discuss the different ways of performing re-establishment in cases where NR PDCP was used for SRB1, and to agree on a solution that works for both re-establishment in EN-DC capable as well legacy eNBs.
- discuss the different ways of performing the resume operation in cases where NR PDCP was used for SRB1 and/or any other radio bearers

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## 2 Problem description

### 2.1 LTE re-establishment procedure

The purpose of the LTE re-establishment procedure is to re-establish the RRC connection upon detecting radio link failure, handover failure, mobility from E-UTRA failure, integrity check failure on SRBs or RRC connection reconfiguration failure. Re-establishment involves the resumption of SRB1, the re-activation of security and the configuration of only the PCell (i.e. CA or DC operations are not re-established)

When the target eNB get a re-establishment request, it identifies the source eNB/cell from the *ReestabUE-Identity* included in the request, and can send an *RLF Indication X2* message to the source eNB. The source eNB may respond with a Handover Request message that includes the UE context (RRC context and S1 context). If the target eNB is able to understand the UE context, re-establishment succeeds and the target sends an *RRCConnectionReestablishment* message to the UE. If the target does not receive the UE context or it doesn't understand the context, it may reject the re-establishment and the UE has to go to RRC\_IDLE to re-connect. If the target doesn't understand the RRC context but can understand the S1 context, it doesn't necessarily should reject the re-establishment and can use still respond with *RRCConnectionReestablishment* and later use full reconfiguration to reconfigure the bearers based on the S1 context.

In case of re-establishment success, SRB1 operation resumes while the operation of other radio bearers (SRB2 and DRBs) remains suspended. If AS security has not been activated, the UE does not initiate the procedure but instead moves to RRC\_IDLE directly.

E-UTRAN applies the re-establishment procedure as follows:

- When AS security has been activated:
  - to reconfigure SRB1 and to resume data transfer only for this RB;
  - to re-activate AS security without changing algorithms.

After this, the UE sends the *RRCConnectionReestablishmentComplete* message, and the target eNB responds by sending an *RRCConnectionReconfiguration* message to reconfigure SRB2 and the DRBs.

The RRC connection re-establishment procedure flow is shown in Figures 1 (success case) and Figure 2 (failure case). SRB0 is used for sending the *RRCConnectionReestablishmentRequest*, *RRCConnectionReestablishment* and *RRCConnectionReestablishmentReject* messages, while *RRCConnectionReestablishmentComplete* uses SRB1.

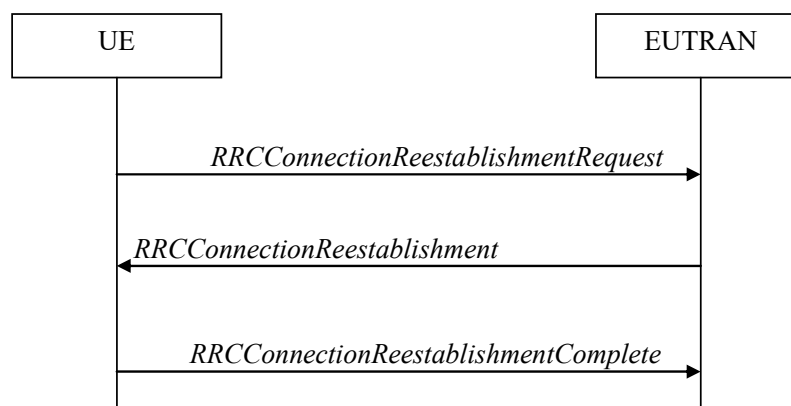
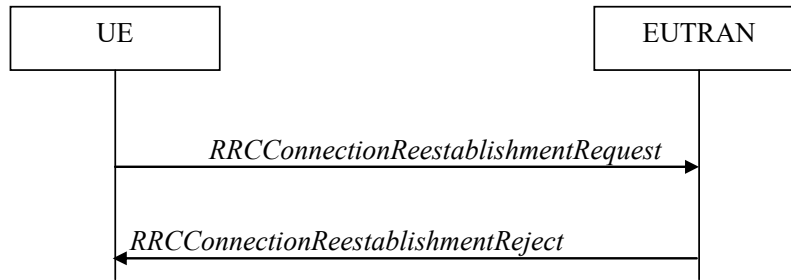


Figure 1: RRC connection re-establishment, successful



**Figure 2: RRC connection re-establishment, failure**

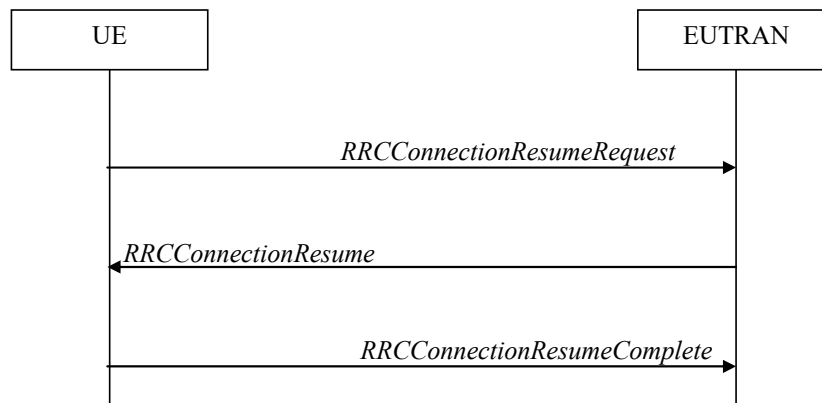
## 2.2 LTE Suspend/Resume procedure

The RRC suspend/resume functionality has been introduced in LTE rel-13. A suspended UE can be considered to be in an intermediate state between IDLE and CONNECTED, where the UE AS context is kept both at the UE and RAN, and the UE can be seen as if it is in connected mode but suspended from the CN point of view and in IDLE mode from the RAN point of view. The advantage of operating in this mode is reduced signaling and faster transition to CONNECTED mode as compared to legacy IDLE-CONNECTED mode transitions, while maintaining the UE power saving advantages of IDLE mode.

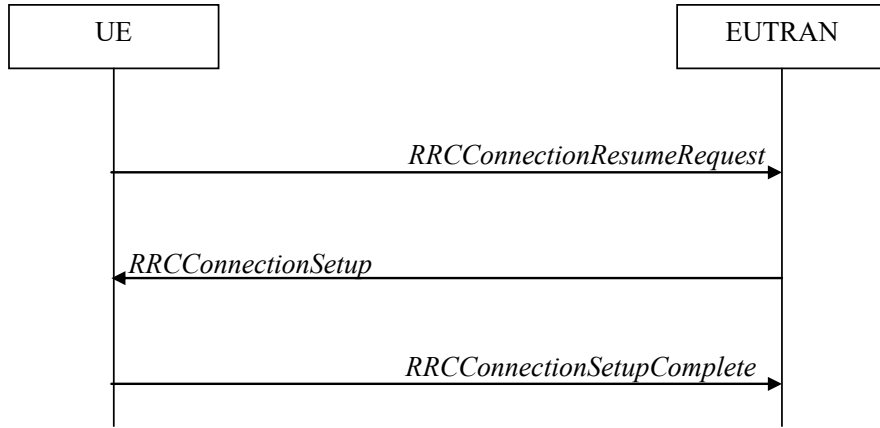
When a decision is made by the network to move the UE to suspended state, the eNB sends the UE an *RRCConnectionRelease* message with the release cause value of *rrc-suspend* and it is also provided with a *Resume ID*. The UE stores the ID and UE AS context (including the current RRC configuration, the current security context, the PDCP state including ROHC state, C-RNTI used in the source PCell, the cellIdentity and the physical cell identity of the source PCell); re-establishes all RLC entities (both for SRBs and DRBs); and suspends all DRBs and SRBs except SRB0.

When the UE later on wants to resume the connection (in response to an UL data to be sent or a paging request for DL data), it sends an *RRCConnectionResumeRequest* message with the saved *Resume ID*. If the resume operation is performed in an eNB other than the eNB that was serving the UE when the UE was suspended, the new eNB can perform a context fetch by using the *Retrieve UE Context X2* procedure from the old eNB (as the Resume ID includes information about the old eNB/cell). Upon getting the context (if resuming on a new eNB) or if the resumption was in the same eNB, the target eNB responds with an *RRCConnectionResume* message, and both the UE and eNB restore the saved UE context, and data transmission/reception from/to the UE can be resumed.

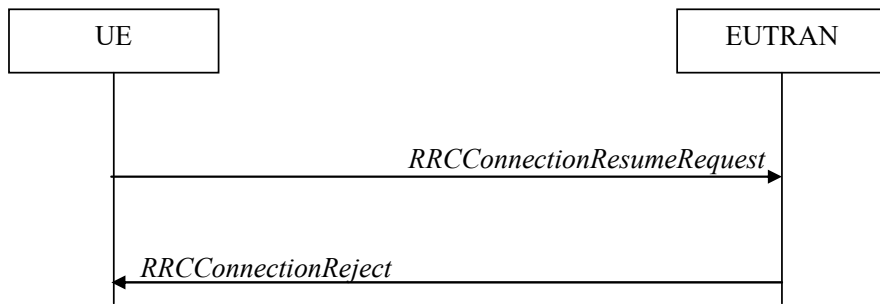
The RRC connection resume procedure flow is shown in Figures 3 (success case), Figure 4 (fallback to RRC connection establishment) and Figure 5 (network reject or release) show the resume procedure in LTE. SRB0 is used for sending the *RRCConnectionResumeRequest*, *RRCConnectionSetup* and *RRCConnectionReestablishmentReject*, while *RRCConnectionResume* and *RRCConnectionResumeComplete* messages use SRB1.



**Figure 3: RRC connection resume, successful**



**Figure 4: RRC connection resume fallback to RRC connection establishment, successful**



**Figure 5: RRC connection resume, network reject or release**

The main difference between resume and re-establishment are (from procedural perspective):

- SRB1 is used for the *RRCConnectionResume* message, while SRB0 is used for the *RRCConnectionReestablishment* message
- The *RRCConnectionResume* message, unlike the *RRCConnectionReestablishment* message, can contain the SRB2/DRB configuration, and thus *RRCConnectionReconfiguration* is not needed after resume (while it is necessary in the re-establishment case to reconfigure SRB2/DRBs)

### 2.3 Re-establishment in case NR PDCP was used

If the source eNB is EN-DC capable, it is possible that SRB1 (and other RBs) was configured with NR PDCP (even if the UE was not in EN-DC). This may cause problems if the target eNB is a legacy eNB. The table below illustrates the problem.

**Table 1: Different cases of PDCP version usage for SRB1 and support of NR PDCP at the source and target eNBs**

		Source eNB = legacy Target eNB = legacy	Source eNB = legacy Target eNB = NR capable	Source eNB = NR capable Target eNB = legacy	Source eNB = NR capable Target eNB = NR capable
SRB1 uses LTE PDCP		A	B	C	D
SRB1 uses NR PDCP		Not applicable	Not applicable	E	F

NR PDCP					
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For cases A to D, there will be no issue because LTE PDCP is used for SRB1, and both source and target eNBs understand that. Case F is also OK because both source and target are EN-DC capable.

In Case E, if the UE resumes with re-establishing SRB1 with NR PDCP, then RRC communication with the target will not be possible (even the *RRCConnectionReestablishmentComplete* message can't be received at the target eNB). The target eNB's behaviour is also not clear upon getting a UE context that it (partially) doesn't understand.

## 2.4 Resume in case NR PDCP was used

The different cases of table 1 are still relevant in the resume case. But there are two major differences to consider:

- SRB1 is used for the Resume message, so if both the UE and the target eNB use the same PDCP version, even the Resume message may not be understood by the UE.
- No *RRCConnectionReconfiguration* after resume is required (i.e. Resume message contains radio resource configuration)

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## 3 Possible solutions

### 3.1 Re-establishment

During the online discussion and offline discussion with some companies afterwards, several ways of solving the problem were identified:

#### **Solution 1: UE always falls back to using LTE PDCP on re-establishment**

- If target eNB doesn't support EN-DC, and it doesn't understand the RRC Context, it will use the S1 context to do full reconfiguration of the bearers
- If target eNB supports EN-DC, the target will first setup SRB1 with LTE PDCP, and can use the *RRCConnectionReconfiguration* message to revert the PDCP of SRB1 back to NR.

#### **Solution 2: target eNB supporting EN-DC includes a flag in *RRCConnectionReestablishment* that indicates that it can support EN-DC**

- If UE gets such an indication, it uses the same PDCP version that it was using before failure
- If UE doesn't get such an indication, UE falls back to using LTE PDCP

#### **Solution 3: UE re-establishes using the same PDCP version that it was using before failure**

- If target eNB doesn't support EN-DC, and it doesn't understand the RRC context, it will reject the re-establishment; or
- If source eNB knows that the target eNB doesn't support EN-DC, it will not forward the UE context to the target (i.e. it will not respond with Handover Request upon getting RLF indication), forcing the target eNB to reject the re-establishment.

#### **Solution 4: UE determines which PDCP is used for re-establishment procedure using "nr-Indication" in SIB.**

**Solution4a: UE determines which PDCP is used for re-establishment procedure using one new indication (eNB support NR PDCP) in SIB2/3.**

#### **Solution 5: The SRB1 is reverted to LTE PDCP upon initiation of re-establishment**

- If target eNB does not have the UE AS context or receive the UE AS context but does not support full configuration for handling different eNB release, it will always reject the RRC Connection Re-establishment request.
- If target eNB does not support EN-DC and receive the UE AS context but support full configuration for handling different eNB release, it will respond with RRC Connection Re-establishment (with SRB1 revert to LTE PDCP) and then perform Full configuration in the first RRC Connection Reconfiguration message
- If target eNB supports EN-DC and receive the UE AS context, it will respond with RRC Connection Re-establishment including the RadioBearerConfiguration containing the SRB1 NR PDCP configuration. Upon receiving this, the UE change the PDCP version of SRB1 from LTE PDCP to NR PDCP.

## 3.2 Resume

### 3.2.1 SRB1 aspects

#### **Solution 1: UE always falls back to using LTE PDCP on SRB1 during resume**

- If target eNB doesn't support EN-DC, and it doesn't understand the RRC Context, it needs to send an extra *RRCCONNECTIONRECONFIGURATION* after the resume to do full reconfiguration of the bearers based on the S1 context
- If target eNB supports EN-DC, the target will first setup SRB1 with LTE PDCP, and can use the *Resume* message to revert the PDCP of SRB1 back to NR.

#### **Solution 2: UE re-establishes using the same PDCP version that it was using before suspension**

- If target eNB doesn't support EN-DC, and it doesn't understand the RRC context, it will respond with *RRCCONNECTIONSETUP*, and send an *RRCCONNECTIONRECONFIGURATION* after the connection setup to do full reconfiguration of the bearers based on the S1 context ; or
- If source eNB knows that the target eNB doesn't support EN-DC, it will not forward the UE context to the target (i.e. it will respond with Retrieve UE Context Failure), forcing the target eNB to reject the resume or use *RRCCONNECTIONSETUP* (but this time, since no S1 UE context is available, we will need NAS recovery to re-setup the bearers)

#### **Solution 3: UE determines which PDCP is used for resume procedure using "nr-Indication" in SIB.**

- **Solution3a: UE determines which PDCP is used for resume procedure using one new indication (eNB support NR PDCP) in SIB2/3.**

#### **Solution 4: The SRB1 is reverted to LTE PDCP upon initiation of resumption**

- If target eNB cannot retrieve the UE context or does not comprehend it and does not perform full configuration, it will always reject the RRC Connection Resume request.
- If target eNB can retrieve the UE context but does not comprehend it (i.e. not supporting EN-DC) and support full configuration, it will perform RRC Resume with Full configuration over SRB1 with LTE PDCP. With the full configuration, the SRB1/2 and DRB can all be switched to LTE PDCP
- If target eNB supports EN-DC and successfully retrieve the UE context, it will respond with RRC Connection Resume including the RadioBearerConfiguration containing the SRB1 NR PDCP configuration. Upon receiving this, the UE should change the PDCP version of SRB1 from LTE PDCP to NR PDCP.

### 3.2.2 SRB2/DRB aspects

In the case of re-establishment, we have already agreed that:

Agreements

- 1 For re-establishment in LTE, UE releases the lower layer SCG configuration (i.e. nr-secondaryCellGroupConfig) at RRC re-establishment while the DRB configuration (incl. the NR PDCP configuration received in radioBearerConfig) is kept.

This aspect was not discussed online for the resume case. The keeping of the bearer configuration is even more relevant for the resume case because *RRCCONNECTIONRECONFIGURATION* is not needed after resume and as such keeping the bearer configuration facilitates the possibility of performing delta configuration via the resume message.

**Proposal 1: On LTE suspend, the DRB configuration (incl. the NR PDCP configuration received in radioBearerConfig) is kept.**

Regarding the resumption of SRB2/DRBs, since the resume message contains radio bearer configurations, it is natural to extend it to also include NR configurations.

**Proposal 2: The resume message to be aligned with RRCCONNECTIONRECONFIGURATION message to enable configuration of bearers with NR PDCP.**

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## 4 Discussion

**Question 1: Which solution do you prefer regarding the PDCP version to be used for SRB1 during re-establishment? Why?**

Company	Preferred solution	Comments
Ericsson	Solution 3	<ul style="list-style-type: none"><li>- In both Solution1 and 2, mapping of the NR security algorithms to the LTE algorithms is required by both the UE and network (as SRB1 is used to send the <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> message). In rel-15, we have a clear mapping/support for this, but this means in the future we might face a problem as new algorithms get introduced in NR (or else have to put a limitation that even in future releases of EN-DC, SRB1 can't use non LTE compatible algorithms)</li><li>- Keeping the NR PDCP is the most forward compatible solution, i.e. in the future, as more EN-DC capable eNBs are deployed, it will become very unlikely to pop up in an eNB that doesn't support NR PDCP.</li><li>-Solution 3 has the least standardization impact.</li></ul>
Lenovo	Solution 1 or Solution 4 (proposed by Intel)	<p>Sufficient and sufficiently clear.</p> <p>Solution 3 may not be possible for legacy eNBs since they had no idea about such a case (NR PDCP) and were planning on full configuration after a successful admission control!! Though "preparation between source and target" could ensure that such confusing situation is taken care off but in that case the re-establishment possibility would reduce (only limited target cell prepared for re-establishment)</p>
LG	Solution 4	<p>If the UE was configured with EN-DC, the surrounding neighbor cell are most likely to support EN-DC also. We think that the case moving from source eNB supporting EN-DC to target eNB also supporting EN-DC is much more frequent than otherwise. In addition, moving to pure LTE in the future will be even rarer. Thus,</p>

		<p>we do not prefer the fall-back procedure, solution 1.</p> <p>Solution 3 has the least impact on specification and legacy network, but it is true that the UE has to transit to RRC_IDLE. Compared to accepting re-establishment and performing full configuration, it will take more time to perform initial RRC connection.</p> <p>Regarding solution 2, though it was not discussed and agreed in RAN2, SA2 approved to introduce a SIB indicator for the support of NR as secondary RAT in E-UTRA cell (CR S2-176090). Thus, if we want an approach that changing PDCP according to the eNB capability, the UE can use that indication to decide which PDCP would be used instead of additional bit in RRCConnectionReestablishment message.</p> <p>Based on that, we suggest to slightly change the solution 2 (i.e. solution 4) as below:</p> <p><b>Solution 4: UE determines which PDCP is used for re-establishment procedure using “nr-Indication” in SIB.</b> (In this solution, “nr-Indication” indicates whether the E-UTRA cell is capable of supporting dual connectivity with locally available NR secondary cell(s) via SIB1, and this already proposed by Qualcomm in R2-1713639 based on the SA2 agreement.)</p> <ul style="list-style-type: none"> <li>- If UE gets a “nr-Indication” as true via SIB1, it uses the same PDCP version that it was using before failure.</li> <li>- If UE doesn’t get a “nr-Indication”, UE falls back to using LTE PDCP.</li> </ul> <p>Solution 4 is preferred as long as RAN2 does not reject the SA2 agreement. Otherwise Solution 2 would be better.</p>
CATT	Solution 1	<p>It’s simple and can be used by legacy eNB. No impact on the legacy eNB and specificaiton.</p> <p>The benefit of Solution3 is unclear. It can’t reduce the signalling overhead, because <i>RRCConnectionReconfiguration</i> message is still needed. And even more EN-DC capable eNBs will be deployed in the future, the legacy eNBs are still there. The re-establishment to legacy eNB can not be avoided.</p> <p>Besides the specification impact, Solution 3 also increases the eNB complexity, because the source eNB should distinguish whether the target eNB support EN-DC or not before sending the UE context.</p>
OPPO	Solution 4	<p>We think the key point is whether UE can know if the cell to reestablish support EN-DC or not. Thus solution 4 seems to be straight forward. And one note is that we need to interpret the nr_indicator as EN-DC capable.</p>
Intel	Solution 5	<p>We should first discuss what legacy eNB behaviour should be. To our understanding, the legacy eNB behaviour is:</p> <ul style="list-style-type: none"> <li>• If eNB does not have the UE context, it will always reject the RRC Connection Re-establishment request.</li> <li>• If eNB does not support EN-DC and receive the UE context, , there are two possible legacy network behaviours possible: <ul style="list-style-type: none"> <li>a) It will reject the re-establishment</li> <li>b) it will respond with RRC Connection Re-establishment and then perform Full configuration in the first RRC Connection Reconfiguration message</li> </ul> </li> </ul> <p>Hence for backward compatibility, both network implementations</p>



		<p>has to be supported. Solution3 mentioned above is not backward compatible and cannot be supported by at least some legacy eNBs using (b).</p> <p>To avoid the impact to legacy eNB, upon initiating the RRC Connection Reestablishment request, the SRB1 should use the default configuration where the PDCP version should be LTE PDCP. A full configuration reverts the PDCP to LTE PDCP for DRB. However, Full configuration does not change SRB1 configuration, UE has to revert to LTE PDCP for SRB1.</p> <p>Then for eNB that supports EN-DC and receive the UE context, it will respond with RRC Connection Re-establishment including the RadioBearerConfiguration containing the SRB1 NR PDCP configuration. Upon receiving this, the UE should change the PDCP version of SRB1 from LTE PDCP to NR PDCP. The first reconfiguration message will decide on SRB2 and the DRB configuration (either keep them as the configuration prior to the re-establishment or perform delta configuration).</p>
Convida Wireless	Solution 1 or Solution 5.	We are sympathetic to solution 3 but it may require a new behaviour from legacy eNBs considering the proposal that "If target eNB doesn't support EN-DC, and it doesn't understand the RRC context, it will reject the re-establishment".
Nokia	Solution4a	<p>Adding 1 bit indication (NR-PDCP supported) in SIB can help solve all PDCP selection problem in both cases, RRC Connection Reestablishment procedure and RRC Connection Resume procedure.</p> <p>We doubt reusing nr-Indication for NR PDCP supported indication is a good proposal because nr-Indication is designed for 5g marketing advertising and for per PLMN. The NR-PDCP support is for eNB self, which doesn't need per PLMN. Furthermore, eNB who supports EN-DC doesn't means it must support NR PDCP. We already had agreement in this meeting that one-step bearer type change + PDCP type change can be supported. So one explicit indication for NR PDCP support in SIB2/3 is more attractive to cover all cases.</p>
Huawei	Solution 1	We don't see the need for any new indication. It is simple to always fall back to LTE PDCP upon re-establishment/resume. For re-establishment, the network can configure NR PDCP in the first reconfiguration if it wishes to. For resume, it should be possible in the resume message to reconfigure SRB1 to use NR PDCP.
Spreadtrum	Solution 4	<p>For eNB supporting EN DC, an indicator can be added into its SI. No impacts to the legacy eNBs.</p> <p>The UE can check the indicator and decide to use LTE PDCP or NR PDCP for connection reestablishment. This way can solve security algorithm problems too.</p>

**Question 2: Which solution do you prefer regarding the PDCP version to be used for SRB1 during resume? Why?**

Company	Preferred solution	Comments
Ericsson	Solution 2	The reason is similar to the case for re-establishment.
Intel	Solution 2	For backward compatibility with an eNB that implements Full

		<p>configuration in msg 4 Resume message sent with LTE PDCP, UE should already revert to LTE PDCP before sending Resume request.</p> <p>For the case the eNB supports EN-DC and successfully retrieve the UE context, it will respond with RRC Connection Resume including the RadioBearerConfiguration containing the SRB1 NR PDCP configuration. Upon receiving this, the UE should change the PDCP version of SRB1 from LTE PDCP to NR PDCP.</p>
LG	Solution 3+3a	We also think that UE can determine which PDCP to use for resume procedure using one indication broadcasted in SIB. And we think that the reconfiguration procedure that always accompanies the resume procedure is not beneficial.
OPPO	3+3a	Agree with LG and align with the reestablishment case.
Lenovo/ MotM	Solution 1	Same reasons as above for re-est case.
Nokia	Solution 3+3a	It has been discussed in our feedback to Q1.
CATT	Solution 2	<p>If target eNB cannot retrieve the UE context or does not comprehend it , it can reject the RRC Connection Resume request or send RRC Connection Setup to trigger UE to fallback. So there is no problem for legacy eNB.</p> <p>If target eNB support NR PDCP and successfully retrieve the UE context, it can resume UE with NR PDCP.</p>
Spreadtrum	3+3a	Share LG's view

**Question 3: What is your view regarding proposal 2 on the SRB2/DRB aspects during resumption?**

Regarding the resumption of SRB2/DRBs, since the resume message contains radio bearer configurations, it is natural to extend it to also include NR configurations.

**Proposal 2: The resume message to be aligned with RRCConnectionReconfiguration message to enable configuration of bearers with NR PDCP.**

Company	Comments
Intel	<p>The PDCP version for SRB2/DRB will depend on whether (i) UE receives a full configuration flag with no radio bearer configuration, (ii) UE receives a full configuration flag with radio bearer configuration or UE receives only optionally radio bearer configuration.</p> <p>If (i), SRB2/DRB is reverted to LTE PDCP.</p> <p>If (ii), SRB2/DRB stays with NR PDCP</p>
LG	We agree with Intel.
Lenovo/ MotM	Agree with Intel.
Nokia	More time needed to check it.
CATT	We agree the proposal 2
Spreadtrum	Agree with Intel

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## 5 Summary

### **Question 1: Which solution do you prefer regarding the PDCP version to be used for SRB1 during re-establishment?**

Solution 1: Lenovo, CATT, Convida, Huawei, Ericsson

Solution 2:

Solution 3:

Solution 4: LG, OPPO, Nokia, Spreadtrum

Solution 5: Intel, Convida

There is an equal preference for solution 1 and 4. However, solution 5 is also a modified version of solution 1 (i.e. revert to LTE PDCP, and later change to NR PDCP if target eNB supports EN-DC). Solution 4 also needs further discussion on the introduction of a new SIB bit or the feasibility of using the 5G indication bit that was already introduced in earlier. Considering this, it is proposed:

#### **Proposal 1: On re-establishment,**

- **UE reverts to using LTE PDCP for SRB1**
- **If target eNB supports EN-DC, it can use RRCConnectionReconfiguration to revert the PDCP version of SRB1 or any other bearers to NR**
- **If target eNB doesn't support EN-DC, it can perform full configuration to revert the PDCP version of all bearers to LTE PDCP.**

### **Question 2: Which solution do you prefer regarding the PDCP version to be used for SRB1 during resume?**

Solution 1: Lenovo

Solution 2: Ericsson, Intel, CATT

Solution 3: LG, OPPO, Spreadtrum, Nokia

There was not as many input on this as for the re-establishment.

Solution 3 has got a slight preference, but as agreed in the re-establishment discussion, it requires further discussion about the SIB bit to be introduced/used. Solution 2, will not cause a problem in case the target is legacy as in the re-establishment case, because here the target behaviour is well defined. That is, it will respond with RRCConnectionSetup (while in the re-establishment case, it could still respond with re-establish command, as it can do full reconfiguration later).

#### **Proposal 2: On resume,**

- **UE uses the same PDCP version as before suspension for SRB1**
- **If target eNB doesn't support EN-DC and it doesn't understand UE context, it will respond to the resume request with RRCConnectionSetup.**

Regarding the third aspect,

**The resume message to be aligned with RRCConnectionReconfiguration message to enable configuration of bearers with NR PDCP.**

There seems to be a strong support (except one company, Nokia, who indicated they need to check further)

**Proposal 3: The *RRCResume* message to be aligned with *RRCConnectionReconfiguration* message to enable configuration of bearers with NR PDCP.**