Sophia Antipolis, 24-27 Aug 1999

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.060	CR	prov1	Current Version:	
3G specification number ↑		*↑ CR number as allocated by 3G support team*		

For submision to TSG SA#5 *(list TSG meeting no. here ↑)*

for approval [X]
for information [ ]
(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: *(at least one should be marked with an X)*

USIM [ ] ME [X] UTRAN [X] Core Network [X]

Source: Nokia **Date:** 20/08/1999

Subject: MM states in UMTS

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	[ ]
A	Corresponds to a correction in a 2G specification	[ ]
B	Addition of feature	[X]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Reason for change: The MM states are not yet described in 23.060. This contribution proposes to add them. Note that some points are marked FFS, if they are linked to points under discussion.

Clauses affected: Text proposed for chapter 6.3 and 6.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

6.3.1 MM-DETACHED

In the MM-DETACHED state there is no communication going on between the UE and the 3G-SGSN. The UE MM state machine does not react on system information related to the 3G-SGSN. UE is not reachable by 3G-SGSN, as the location of UE is not known.

After a packet data attach, the state changes to MM-CONNECTED, in the 3G-SGSN when receiving the request, and in the UE when receiving an indication that the request was successfully received by SGSN.

6.3.2 MM-IDLE

The location of UE is known on accuracy of a routing area (RA). Paging is needed in order to reach UE, e.g. for signaling.

The UE shall perform Routing area update if RA changes. Signaling towards HLR is needed if the 3G-SGSN is not having an MM context for this UE.

The 3G-SGSN shall move to MM-Connected after receiving an uplink signaling message from the UE.

The UE shall move to MM-Connected when receiving an indication that a signaling message was successfully received by SGSN.

Note: In practice a response message (or delivery of packet after a paging response) proves that the uplink packet was successful.

Packet data detach changes the state to MM-DETACHED. The 3G-SGSN may perform an implicit detach any time after the MS reachable timer expiry. The MM context of UE is deleted preferably after a certain (implementation dependent) time. HLR may be informed about the deletion (see Purge procedure).

6.3.3 MM-CONNECTED

The location of UE is known to 3G-SGSN on accuracy of serving RNC. In MM-CONNECTED state, the location of the UE is tracked by the Serving RNC. The UE is not anymore performing Routing Area Update procedure (except maybe triggered by RNC in SRNC relocation procedure FFS).

When an MS is MM-Connected, a signaling connection is established between the MS and the SGSN. This connection is made of two parts, an RRC connection and a Iu connection.

Note: The SGSN does not know the real Routing Area in which the UE is located but only the last Routing Area in which UE is registered. Serving RNC relocation is performed if SRNC changes.

In 3G-SGSN, Iu connection release or failed downlink transfer with cause "IMSI unknown in RNC" changes the state to MM-IDLE.

The UE shall move to MM-IDLE if the radio connection for packet is released (a radio connection for CS transfer may remain). The radio connection release is explicitly indicated by RNS to UE. The radio connection shall also be released if a URA update fail because of "RRC connection not established" or if URA update timer expire while the UE is out of coverage.

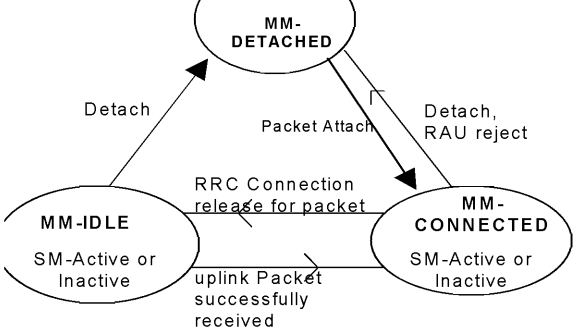
Note: After a signaling procedure (e.g. routing area update), the SGSN may decide to release the Iu connection which moves the state to MM-Idle (FFS).

Packet data detach changes the state to MM-DETACHED.

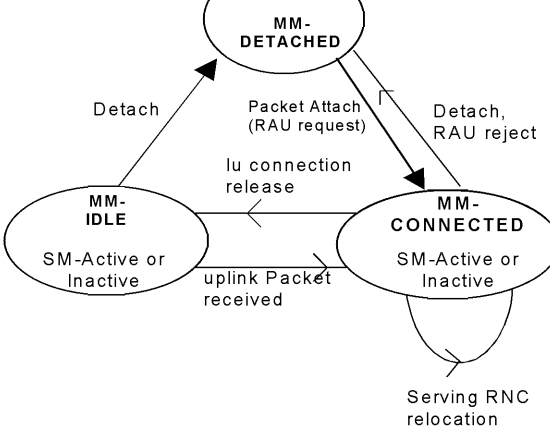
6.4 UMTS MM state functionality

6.4.1 State Transitions and Functions for UMTS

The figure below introduces the states of MM. The states and activations are further described in sub-sections.



MM States in UE



MM States in 3G-SGSN

Note (FFS): In both MM-Idle and MM-connected, the Session Management may or may not have activated PDP context. The consequence is that in MM connected mode, only a signaling connection might be established. In MM-Idle mode, PDP context may be established, but no corresponding connection over Iu and the radio are established.

6.4.2 Error cases

In case of error, the MM state of the UE and the 3G-SGSN might become out of synchronisation. In this case the UE may be in MM-Idle while the 3G-SGSN is in MM- connected.

Note: The opposite (UE in MM-Connected and SGSN in MM-IDLE) shall never happen because 3G-SGSN might not have the RAI where the UE is really located, so downlink transfer will be impossible until the periodic URA update timer expires.

This situation is recovered by a successful RAU moving the UE to MM-Connected, or by a failed downlink transfer with cause "IMSI unknown in RNC", triggering a paging procedure from 3G-SGSN.

Note: A RNS shall not release the Iu connection if it could not inform the UE that the radio connection was released.