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(54) **ON-DEMAND REQUEST FOR SYSTEM INFORMATION**

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(57) **ABSTRACT**

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A method for requesting system information. The method comprises transmitting a request for at least one system information block group, each of which comprises one or more system information blocks, from a user terminal to a network node. The one or more system information blocks is/are grouped according to a feature of the one or more system information blocks. The method may further comprise receiving one or more system information block groups from the network node. The one or more system information block groups may comprise the at least one system information block group.

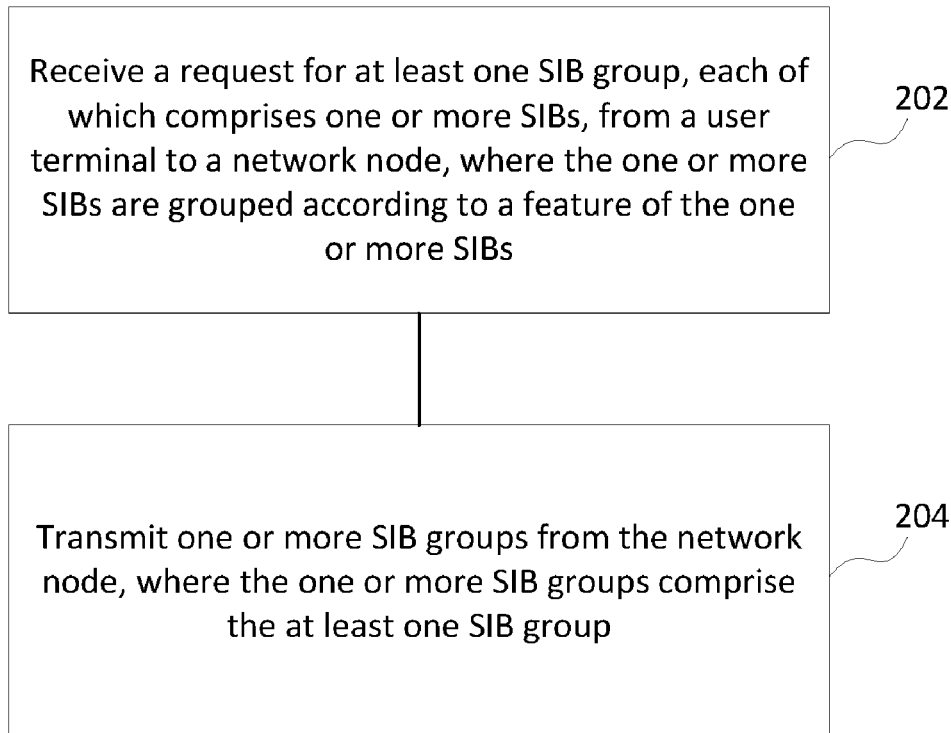
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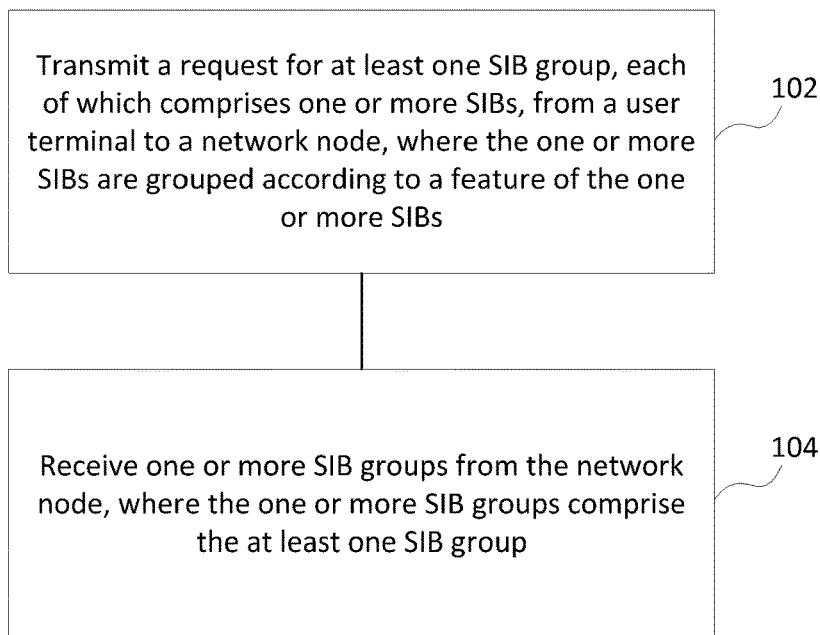


Fig.1

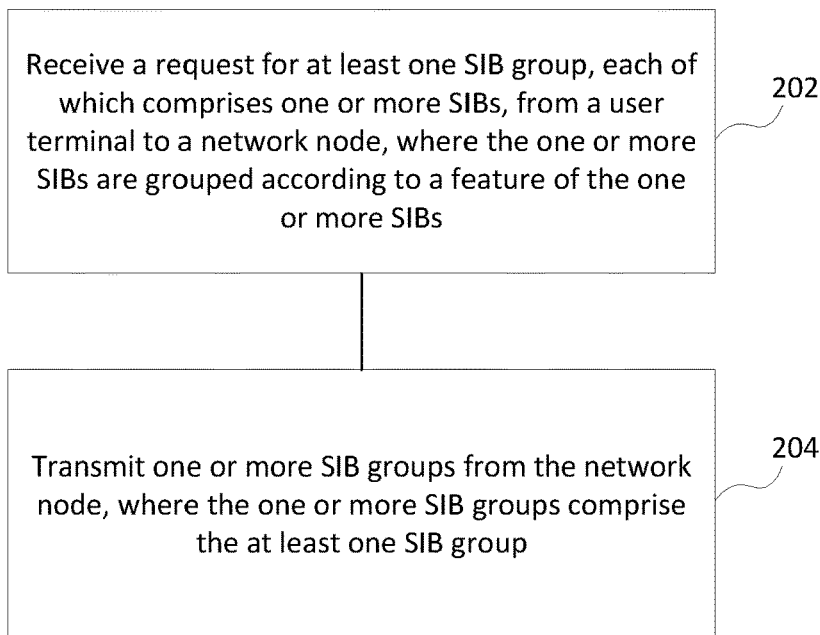


Fig.2

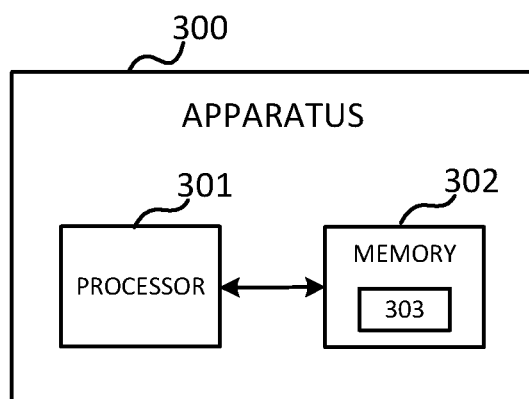


Fig.3

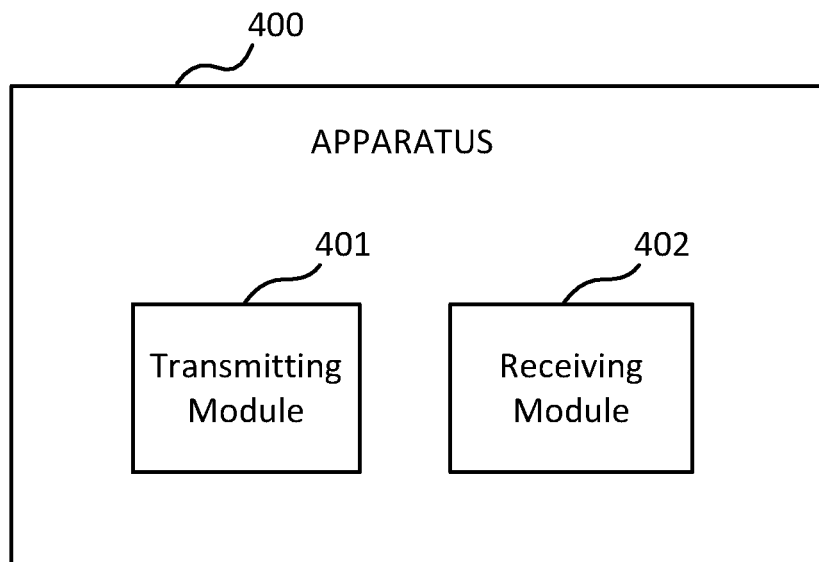


Fig.4

ON-DEMAND REQUEST FOR SYSTEM INFORMATION

FIELD OF THE INVENTION

[0001] The present disclosure generally relates to communications, and more specifically, relates to wireless communications.

BACKGROUND

[0002] In a communication network such as Long Term Evolution (LTE) system, system information (SI) is important as it can provide necessary information to a user terminal, such as a user equipment (UE) or a wireless device, for linking with the communication network. In new radio (NR), SI may be classified into minimum SI and other SI. Minimum SI is the SI that a user terminal must read before it can know how to access the network. Other SI is the SI not within minimum SI. SI may be transmitted to the user terminal in a master information block (MIB) and/or a system information block (SIB). For example, minimum SI may correspond to MIB, SIB1 and SIB2 in LTE. Other SI may correspond to those remaining SIBs. Since other SI is not necessary for a user terminal to access network, in order to achieve energy efficiency, it may be desirable that the SI may be requested on demand.

SUMMARY

[0003] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

[0004] The present disclosure proposes a solution of on-demand request for SI, which may enable a communication network to transmit or broadcast SI, such as other SI as mentioned previously, according to a request for the SI from a user terminal.

[0005] According to a first aspect of the present disclosure, there is provided a method for requesting SI, which may be performed at an apparatus such as a user terminal. The method may comprise transmitting a request for at least one SIB group, each of which comprises one or more SIBs, from a user terminal to a network node. The one or more SIBs may be grouped according to a feature of the one or more SIBs. The method may further comprise receiving one or more SIB groups from the network node. The one or more SIB groups may comprise the at least one SIB group.

[0006] In an exemplary embodiment, the method according to the first aspect of the present disclosure may further comprise receiving notification information from the network node. For example, transmission of the at least one SIB group may be predefined or derived based at least partly on the notification information.

[0007] In an exemplary embodiment, the method according to the first aspect of the present disclosure may further comprise receiving an indicator from the network node. The indicator may indicate at least one of: which SIB group is being transmitted from the network node, and which SIB group is scheduled to be transmitted from the network node.

[0008] According to a second aspect of the present disclosure, there is provided an apparatus for requesting SI, which

one memory comprising computer program code. The at least one memory and the computer program code may be configured to, with the at least one processor, cause the apparatus at least to perform any step of the method according to the first aspect of the present disclosure.

[0009] According to a third aspect of the present disclosure, there is provided a computer program product comprising a computer-readable medium bearing computer program codes embodied therein for use with a computer. The computer program codes may comprise code for performing any step of the method according to the first aspect of the present disclosure.

[0010] According to a fourth aspect of the present disclosure, there is provided an apparatus for requesting SI. The apparatus may comprise a transmitting module and a receiving module. In accordance with some exemplary embodiments, the transmitting module may be operable to carry out at least the transmitting step of the method according to the first aspect of the present disclosure. The receiving module may be operable to carry out at least the receiving step of the method according to the first aspect of the present disclosure.

[0011] In accordance with an exemplary embodiment, the transmission of the request may comprise transmitting a preamble for indicating the at least one SIB group.

[0012] In accordance with an exemplary embodiment, the transmission of the request may comprise: selecting, from a plurality of preambles, a preamble associated with the at least one SIB group; and transmitting the request to the network node. The request may include the selected preamble.

[0013] In accordance with an exemplary embodiment, the at least one SIB group may be indicated by transmission timing of the preamble.

[0014] In accordance with an exemplary embodiment, the transmission of the request may comprise transmitting the request to the network node in accordance with a selected transmission timing associated with the at least one SIB group.

[0015] According to a fifth aspect of the present disclosure, there is provided a method for transmission of SI, which may be performed at an apparatus such as a network node. The method may comprise receiving a request for at least one SIB group, each of which comprises one or more SIBs, from a user terminal to a network node. The one or more SIBs may be grouped according to a feature of the one or more SIBs. The method may further comprise transmitting one or more SIB groups from the network node. The one or more SIB groups may comprise the at least one SIB group.

[0016] In accordance with an exemplary embodiment, the method according to the fifth aspect of the present disclosure may further comprise: transmitting notification information to the user terminal. For example, transmission of the at least one SIB group may be predefined or derived based at least partly on the notification information.

[0017] In accordance with an exemplary embodiment, the method according to the fifth aspect of the present disclosure may further comprise transmitting an indicator from the network node. The indicator may indicate at least one of: which SIB group is being transmitted from the network

[0018] According to a sixth aspect of the present disclosure, there is provided an apparatus for transmission of SI. The apparatus may comprise at least one processor and at least one memory comprising computer program code. The at least one memory and the computer program code may be configured to, with the at least one processor, cause the apparatus at least to perform any step of the method according to the fifth aspect of the present disclosure.

[0019] According to a seventh aspect of the present disclosure, there is provided a computer program product comprising a computer-readable medium bearing computer program codes embodied therein for use with a computer. The computer program codes may comprise code for performing any step of the method according to the fifth aspect of the present disclosure.

[0020] According to an eighth aspect of the present disclosure, there is provided an apparatus for transmission of SI. The apparatus may comprise a receiving module and a transmitting module. In accordance with some exemplary embodiments, the receiving module may be operable to carry out at least the receiving step of the method according to the fifth aspect of the present disclosure. The transmitting module may be operable to carry out at least the transmitting step of the method according to the fifth aspect of the present disclosure.

[0021] In accordance with an exemplary embodiment, the reception of the request may comprise receiving a preamble for indicating the at least one SIB group.

[0022] In accordance with an exemplary embodiment, the reception of the request may comprise receiving the preamble which was selected from a plurality of preambles. The selected preamble may be associated with the at least one SIB group.

[0023] In accordance with an exemplary embodiment, the at least one SIB group may be indicated by transmission timing of the preamble.

[0024] In accordance with an exemplary embodiment, the reception of the request may comprise receiving the request from the user terminal in accordance with a selected transmission timing associated with the at least one SIB group.

[0025] In accordance with an exemplary embodiment, the notification information may be included in minimum SI.

[0026] In accordance with an exemplary embodiment, the notification information may indicate a correspondence between all of preambles and SIB groups.

[0027] In accordance with some exemplary embodiments, the feature of the one or more SIBs may comprise at least one of functionality and periodicity of the one or more SIBs.

[0028] In accordance with some exemplary embodiments, the request for the at least one SIB group may comprise a preamble for indicating the at least one SIB group. The at least one SIB group may be indicated by or associated with a preamble sequence or the transmission timing of the preamble. For example, the indication of the at least one SIB group by the preamble may be predefined or derived based at least partly on the notification information from the network node.

[0029] In accordance with some exemplary embodiments, the one or more SIB groups from the network node may

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] The disclosure itself, the preferable mode of use and further objectives are best understood by reference to the following detailed description of the embodiments when read in conjunction with the accompanying drawings, in which:

[0031] FIG. 1 is a flowchart illustrating a method for requesting SI according to an embodiment of the present disclosure;

[0032] FIG. 2 is a flowchart illustrating a method for transmission of SI according to another embodiment of the present disclosure;

[0033] FIG. 3 is a block diagram illustrating an apparatus according to an embodiment of the present disclosure; and

[0034] FIG. 4 is a block diagram illustrating another apparatus according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0035] The embodiments of the present disclosure are described in detail with reference to the accompanying drawings. Reference throughout this specification to features, advantages, or similar language does not imply that all of the features and advantages that may be realized with the present disclosure should be or are in any single embodiment of the disclosure. Rather, language referring to the features and advantages is understood to mean that a specific feature, advantage, or characteristic described in connection with an embodiment is included in at least one embodiment of the present disclosure. Furthermore, the described features, advantages, and characteristics of the disclosure may be combined in any suitable manner in one or more embodiments. One skilled in the relevant art will recognize that the disclosure may be practiced without one or more of the specific features or advantages of a particular embodiment. In other instances, additional features and advantages may be recognized in certain embodiments that may not be present in all embodiments of the disclosure.

[0036] In a wireless network such as new radio (NR), SI may be broadcasted by a network node, such as a base station or a next generation Node B (gNB), in a cell to all user terminals monitoring the specific cell. It is important for a user terminal to maintain the required SI because otherwise it cannot interact with the network in an interoperable manner. As mentioned previously, minimum SI in NR corresponds to MIB, SIB1 and SIB2 in LTE. There are some assumptions about how to request other SI from the network. For example, some messages like MSG1 and/or MSG3 may be used to carry a request for other SI.

[0037] If using one preamble of MSG1 to carry a request for all other SI, then it may result in unnecessary transmission of some undesired other SI. This is because there is quite a lot of other SI in the system and the network may have to broadcast all other SI when it receives such preamble to request other SI. However, a user terminal may not need all the other SI.

[0038] If using MSG3 to request other SI, since there could be contention during a random access procedure, the network may not be able to detect MSG3 reliably in time. In addition, there are additional overhead and delay because more messages are transmitted for requesting other SI.

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