

CANDIDATE CELL CONFIGURATION FOR LTM

TECHNICAL FIELD

[0001] The present disclosure relates to wireless communications, and more specifically to base stations, a user equipment, processors, and methods for supporting candidate cell configuration for layer 1/layer 2 (L1/L2)-triggered mobility (LTM).

BACKGROUND

[0002] A wireless communications system may include one or multiple network communication devices, such as base stations, which may be otherwise known as an eNodeB (eNB), a next-generation NodeB (gNB), or other suitable terminology. Each network communication devices, such as a base station may support wireless communications for one or multiple user communication devices, which may be otherwise known as user equipment (UE), or other suitable terminology. The wireless communications system may support wireless communications with one or multiple user communication devices by utilizing resources of the wireless communication system (e.g., time resources (e.g., symbols, slots, subframes, frames, or the like) or frequency resources (e.g., subcarriers, carriers). Additionally, the wireless communications system may support wireless communications across various radio access technologies including third generation (3G) radio access technology, fourth generation (4G) radio access technology, fifth generation (5G) radio access technology, among other suitable radio access technologies beyond 5G (e.g., sixth generation (6G)).

[0003] In 3GPP, a new work item on further new radio (NR) mobility enhancements, named as LTM, was approved to change a serving cell via L1/L2 signalling, in order to reduce the latency, overhead and interruption time. The LTM is a PCell (primary cell of a master cell group) or PSCell (primary cell of a secondary cell group) cell switch procedure that the network triggers via medium access control - control element (MAC CE) based on L1 measurements. The potential applicable scenarios of LTM include intra-CU intra-distributed unit (DU) LTM, intra-CU inter-DU LTM, and inter-CU LTM. However, for LTM, especially for inter-CU LTM, there are still some open problems in providing candidate cell configurations that need to be studied.

SUMMARY

[0004] The present disclosure relates to methods, apparatuses, and systems that support candidate cell configuration for LTM.

[0005] In a first aspect of the solution, a base station may comprise: a processor; and a transceiver coupled to the processor, wherein the base station is a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), and the processor is configured to: determine one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; and transmit, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations, wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.

[0006] In some implementations of the method and apparatuses described herein, the processor may be further configured to: transmit, via the transceiver and to the candidate target node, a first request message including a first source UE identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node.

[0007] In some implementations of the method and apparatuses described herein, the processor may be further configured to: transmit, via the transceiver and to the candidate target node, a first message including a first source UE identifier and one or more second LTM reference configurations associated with the first source UE identifier.

[0008] In some implementations of the method and apparatuses described herein, the processor may be further configured to: receive, via the transceiver and from the candidate target node, a message for responding to the first message.

[0009] In some implementations of the method and apparatuses described herein, the first request message may further include one or more second LTM reference configurations associated with the first source UE identifier.

[0010] In some implementations of the method and apparatuses described herein, the first request message may further include a first indicator to indicate the candidate target node to store the one or more second LTM reference configurations.

[0011] In some implementations of the method and apparatuses described herein, the one or more second LTM reference configurations may be included in the first request message as one or more corresponding reference configuration information elements (IEs).

[0012] In some implementations of the method and apparatuses described herein, the one or more second LTM reference configurations may be included in a message embedded in the first request message.

[0013] In some implementations of the method and apparatuses described herein, the processor may be further configured to: receive, via the transceiver and from the candidate target node, a first reply message including the first LTM candidate cell configuration, wherein one or more first LTM candidate cell configurations include the first LTM candidate cell configuration.

[0014] In some implementations of the method and apparatuses described herein, the first reply message may further include a first selected LTM reference configuration or an index of the first selected LTM reference configuration in the case that the one or more second LTM reference configurations include multiple LTM reference configurations, wherein the first selected LTM reference configuration is a LTM reference configuration selected from the one or more second LTM reference configurations by the candidate target node for the first LTM candidate cell configuration, wherein the one or more first LTM reference configurations include the first selected LTM reference configuration.

[0015] In some implementations of the method and apparatuses described herein, the processor may be further configured to: transmit, via the transceiver and to the candidate target node, a second request message including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the candidate target node; and receive, via the transceiver and from the candidate target node, a second reply messages including the second LTM candidate cell configuration determined based on the one or more second LTM reference configurations associated with the first source UE identifier, wherein one or more first LTM candidate cell configurations include the second LTM candidate cell configuration.

[0016] In some implementations of the method and apparatuses described herein, the second reply message may further include a second selected LTM reference configuration

or an index of the second selected LTM reference configuration, wherein the second selected LTM reference configuration is a LTM reference configuration selected from the one or more second LTM reference configurations by the candidate target node for the second LTM candidate cell configuration, wherein the one or more first LTM reference configurations include the second selected LTM reference configuration.

[0017] In some implementations of the method and apparatuses described herein, the processor may be further configured to: transmit, via the transceiver and to the candidate target node, a third request message including a third source UE identifier and a third cell identifier for requesting a third LTM candidate cell configuration for a third LTM candidate cell belonging to the candidate target node; and receive, via the transceiver and from the candidate target node, a third reply message including the third LTM candidate cell configuration, wherein the third LTM candidate cell configuration is determined by the candidate target node based on an additional LTM reference configuration provided by the candidate target node, and the additional LTM reference configuration is associated to the third source UE identifier, wherein the one or more first LTM candidate cell configurations include the third LTM candidate cell configuration.

[0018] In some implementations of the method and apparatuses described herein, the third reply message may further include the additional LTM reference configuration, wherein the one or more first LTM reference configurations include the additional LTM reference configuration.

[0019] In some implementations of the method and apparatuses described herein, the third request message may further include a second indicator to indicate the candidate target node to provide the additional LTM reference configuration.

[0020] In some implementations of the method and apparatuses described herein, the additional LTM reference configuration may be same as the third LTM candidate cell configuration, and wherein the third reply message includes a third indicator to indicate that the additional LTM reference configuration is same as the third LTM candidate cell configuration.

[0021] In some implementations of the method and apparatuses described herein, the third request message may further include one or more third LTM reference configurations, the one or more LTM reference configurations are associated with the

third source UE identifier, and the additional LTM reference configuration information is different from the one or more third LTM reference configurations.

[0022] In some implementations of the method and apparatuses described herein, the processor may be further configured to: transmit, via the transceiver and to the candidate target node, a fourth request message including the third source UE identifier and a fourth cell identifier for requesting a fourth LTM candidate cell configuration for a fourth LTM candidate cell belonging to the candidate target node; and receive, via the transceiver and from the candidate target node, a fourth reply messages including the fourth LTM candidate cell configuration, the fourth LTM candidate cell configuration is determined by the candidate target node based on the additional LTM reference configuration associated with the third source UE identifier, wherein the one or more first LTM candidate cell configurations include the fourth LTM candidate cell configuration.

[0023] In some implementations of the method and apparatuses described herein, the fourth request message may further include the additional LTM reference configuration.

[0024] In some implementations of the method and apparatuses described herein, the one or more first LTM reference configurations may be the same as the one or more second LTM reference configurations.

[0025] In some implementations of the method and apparatuses described herein, the one or more first LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations may be transmitted to the UE via a reconfiguration message.

[0026] In some implementations of the method and apparatuses described herein, the reconfiguration message includes one or more configuration information elements (IEs), each configuration IE may include one first LTM reference configuration and at least one LTM candidate cell configuration associated with the one first LTM reference configuration.

[0027] In some implementations of the method and apparatuses described herein, the reconfiguration message may include a reference configuration list in which each of the one or more first LTM reference configurations is associated with at least one LTM candidate cell identifier (ID).

[0028] In some implementations of the method and apparatuses described herein, the LTM candidate cell ID may be a physical cell ID (PCI), a new radio cell global ID (NCGI), or an index of a LTM candidate cell configuration, wherein the index of LTM candidate cell configuration indicates a LTM candidate cell configuration of the one or more first LTM candidate cell configurations.

[0029] In some implementations of the method and apparatuses described herein, the candidate target node may be a candidate base station for LTM, and the first source UE identifier or the third source UE identifier may be a source node UE Xn application protocol (XnAP) ID.

[0030] In some implementations of the method and apparatuses described herein, the base station may include a source central unit (CU) and one or more distributed units (DUs), the processor is a processor of the source CU, the candidate target node is a target DU among the one or more DU, and the first source UE identifier or the third source UE identifier may be a CU UE F1 application protocol (F1AP) ID.

[0031] In a third aspect of the solution, a network device may comprise: a processor; and a transceiver coupled to the processor, wherein the network device is a first network device for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), and the processor is configured to: receive, via the transceiver and from a second network device for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the first network device; and transmit, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration, wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

[0032] In some implementations of the method and apparatuses described herein, the processor may be further configured to: receive, via the transceiver and from the second network device, a first message including the first source UE identifier and one or more LTM reference configurations associated with the first source UE identifier, wherein the one or more LTM reference configurations include the first LTM reference configuration; and store the one or more LTM reference configurations.

[0033] In some implementations of the method and apparatuses described herein, the processor may be further configured to: transmit, via the transceiver and to the second network device, a message for responding to the first message.

[0034] In some implementations of the method and apparatuses described herein, the first request message may further include one or more LTM reference configurations associated with the first source UE identifier, wherein the one or more LTM reference configurations include the first LTM reference configuration.

[0035] In some implementations of the method and apparatuses described herein, the first request message may further include a first indicator to indicate the first network device to store the one or more LTM reference configurations.

[0036] In some implementations of the method and apparatuses described herein, the one or more LTM reference configurations may be included in the first request message as one or more corresponding reference configuration information elements (IEs).

[0037] In some implementations of the method and apparatuses described herein, the one or more LTM reference configurations may be included in a message embedded in the first request message.

[0038] In some implementations of the method and apparatuses described herein, the first LTM reference configuration may be selected from the one or more LTM reference configurations by the first network device for the first LTM candidate cell configuration in the case that the one or more LTM reference configurations include multiple LTM reference configurations.

[0039] In some implementations of the method and apparatuses described herein, the first reply message may further include the first LTM reference configuration or an index of the first LTM reference configuration.

[0040] In some implementations of the method and apparatuses described herein, the processor may be further configured to: receive, via the transceiver and from the second network device, a second request message including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the candidate target node; and transmit, via the transceiver and to the second network device, a second reply messages including the

second LTM candidate cell configuration determined based on the one or more LTM reference configurations associated with the first source UE identifier.

[0041] In some implementations of the method and apparatuses described herein, the second reply message may further include a second LTM reference configuration or an index of the second LTM reference configuration, wherein the second LTM reference configuration is a LTM reference configuration selected from the one or more LTM reference configurations by the first network device for the second LTM candidate cell configuration.

[0042] In some implementations of the method and apparatuses described herein, wherein the first LTM reference configuration may be provided by the first network device, and is associated to the first source UE identifier.

[0043] In some implementations of the method and apparatuses described herein, the first request message may further include a second indicator to indicate the first network device to provide the first LTM reference configuration.

[0044] In some implementations of the method and apparatuses described herein, the first LTM reference configuration is same as the first LTM candidate cell configuration, and wherein the first reply message further includes a third indicator to indicate that the first LTM reference configuration is same as the first LTM candidate cell configuration.

[0045] In some implementations of the method and apparatuses described herein, the first request message may further include one or more LTM reference configurations, the one or more LTM reference configurations are associated with the first source UE identifier, and the first LTM reference configuration is different from the one or more LTM reference configurations.

[0046] In some implementations of the method and apparatuses described herein, the processor may be further configured to: receive, via the transceiver and from the second network device, a second request message including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the first network device; and transmit, via the transceiver and to the second network device, a second reply messages including the second LTM candidate cell configuration, the second LTM candidate cell configuration is determined by the second network device.

[0047] In some implementations of the method and apparatuses described herein, the second request message may further include the first LTM reference configuration.

[0048] In some implementations of the method and apparatuses described herein, the first network device may be a candidate base station for LTM, the second network device may be a source base station for LTM, and the first source UE identifier is a source node UE Xn application protocol (XnAP) identifier.

[0049] In some implementations of the method and apparatuses described herein, the first network device may be a target distributed unit (DU) in a source base station for LTM, the second network device may be source central unit (CU) of the source base station for LTM, and the first source UE identifier may be a CU UE F1 application protocol (F1AP) identifier.

[0050] In a third aspect of the solution, a user equipment (UE) may comprise: a processor; and a transceiver coupled to the processor, wherein the processor is configured to: receive, via the transceiver and from a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, and store the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.

[0051] In some implementations of the method and apparatuses described herein, the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations may be transmitted from the source base station to the UE via a reconfiguration message.

[0052] In some implementations of the method and apparatuses described herein, the reconfiguration message may include one or more configuration information elements (IEs), each configuration IE include one LTM reference configuration and at least one LTM candidate cell configuration associated with the one LTM reference configuration.

[0053] In some implementations of the method and apparatuses described herein, the reconfiguration message may include a reference configuration list in which each of the

one or more LTM reference configurations is associated with at least one LTM candidate cell identifier (ID).

[0054] In some implementations of the method and apparatuses described herein, the LTM candidate cell ID may be a physical cell ID (PCI), a new radio cell global ID (NCGI), or an index of a LTM candidate cell configuration, wherein the index of LTM candidate cell configuration indicates a LTM candidate cell configuration of the one or more LTM candidate cell configurations.

[0055] In a fourth aspect of the solution, a processor for wireless communication may comprise: at least one memory; and a controller coupled with the at least one memory and configured to cause the processor to: determine one or more first layer 1/layer 2 (L1/L2)-triggered mobility (LTM) reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; and transmit, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations, wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.

[0056] In a fifth aspect of the solution, a method performed by a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM) may comprise: determining one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; and transmitting, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations, wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.

[0057] In a sixth aspect of the solution, a processor for wireless communication may comprise: at least one memory; and a controller coupled with the at least one memory and configured to cause the processor to perform: receive, via the transceiver and from a second network device for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate

cell belonging to the candidate target node; and transmit, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration, wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

[0058] In a seventh aspect of the solution, a method performed by a first network device for layer 1/layer 2 (L1/L2)-triggered mobility (LTM) may comprise: receiving, via the transceiver and from a second network device for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node; and transmitting, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration, wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

[0059] In an eighth aspect of the solution, a processor for wireless communication may comprise: at least one memory; and a controller coupled with the at least one memory and configured to cause the processor to: receive, via the transceiver and from a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, and store the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.

[0060] In a ninth aspect of the solution, a method performed by a user equipment (UE) for layer 1/layer 2 (L1/L2)-triggered mobility (LTM) may comprise: receiving, via the transceiver and from a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, and storing the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.

[0061] It is to be understood that the summary section is not intended to identify key or essential features of embodiments of the present disclosure, nor is it intended to be used to limit the scope of the present disclosure. Other features of the present disclosure will become easily comprehensible through the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0062] FIG. 1 illustrates an example of a wireless communications system that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0063] FIGS. 2A to 2C illustrate example scenarios of LTM associated with aspects of the present disclosure.

[0064] FIG. 3 illustrates a signalling procedure for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0065] FIG. 4 illustrates another signalling procedure for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0066] FIG. 5 illustrates an example signalling procedure for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0067] FIG. 6 illustrates another example signalling procedure for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0068] FIGS. 7 to 9 illustrate examples of devices that support candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0069] FIGS. 10 to 12 illustrate examples of processors that support candidate cell configuration for LTM in accordance with aspects of the present disclosure.

[0070] FIGS. 13 to 15 illustrate flowcharts of methods that support candidate cell configuration for LTM in accordance with aspects of the present disclosure.

DETAILED DESCRIPTION

[0071] Principles of the present disclosure will now be described with reference to some embodiments. It is to be understood that these embodiments are described only for the purpose of illustration and help those skilled in the art to understand and implement the present disclosure, without suggesting any limitation as to the scope of the disclosure.

The disclosure described herein may be implemented in various manners other than the ones described below.

[0072] In the following description and claims, unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skills in the art to which this disclosure belongs.

[0073] References in the present disclosure to “one embodiment,” “an example embodiment,” “an embodiment,” “some embodiments,” and the like indicate that the embodiment(s) described may include a particular feature, structure, or characteristic, but it is not necessary that every embodiment includes the particular feature, structure, or characteristic. Moreover, such phrases do not necessarily refer to the same embodiment(s). Further, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is submitted that it is within the knowledge of one skilled in the art to affect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

[0074] It shall be understood that although the terms “first” and “second” or the like may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another element. For example, a first element could also be termed as a second element, and similarly, a second element could also be termed as a first element, without departing from the scope of embodiments. As used herein, the term “and/or” includes any and all combinations of one or more of the listed terms.

[0075] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of example embodiments. As used herein, the singular forms “a,” “an” and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms “comprises,” “comprising,” “has,” “having,” “includes” and/or “including”, when used herein, specify the presence of stated features, elements, and/or components etc., but do not preclude the presence or addition of one or more other features, elements, components and/ or combinations thereof.

[0076] As used herein, the term “communication network” refers to a network following any suitable communication standards, such as, 5G new radio (NR), long term evolution (LTE), LTE-advanced (LTE-A), wideband code division multiple access

(WCDMA), high-speed packet access (HSPA), narrow band internet of things (NB-IoT), and so on. Further, the communications between a terminal device and a network device in the communication network may be performed according to any suitable generation communication protocols, including but not limited to, the first generation (1G), the second generation (2G), 2.5G, 2.75G, the third generation (3G), the fourth generation (4G), 4.5G, the fifth generation (5G) communication protocols, and/or any other protocols either currently known or to be developed in the future. Embodiments of the present disclosure may be applied in various communication systems. Given the rapid development in communications, there will also be future type communication technologies and systems in which the present disclosure may be embodied. It should not be seen as limiting the scope of the present disclosure to only the aforementioned systems.

[0077] As used herein, the term “network device” generally refers to a node in a communication network via which a terminal device can access the communication network and receive services therefrom. The network device may refer to a base station (BS) or an access point (AP), for example, a node B (NodeB or NB), a radio access network (RAN) node, an evolved NodeB (eNodeB or eNB), a NR NB (also referred to as a gNB), a remote radio unit (RRU), a radio header (RH), an infrastructure device for a V2X (vehicle-to-everything) communication, a transmission and reception point (TRP), a reception point (RP), a remote radio head (RRH), a relay, an integrated access and backhaul (IAB) node, a low power node such as a femto BS, a pico BS, and so forth, depending on the applied terminology and technology.

[0078] As used herein, the term “terminal device” generally refers to any end device that may be capable of wireless communications. By way of example rather than a limitation, a terminal device may also be referred to as a communication device, a user equipment (UE), an end user device, a subscriber station (SS), an unmanned aerial vehicle (UAV), a portable subscriber station, a mobile station (MS), or an access terminal (AT). The terminal device may include, but is not limited to, a mobile phone, a cellular phone, a smart phone, a voice over IP (VoIP) phone, a wireless local loop phone, a tablet, a wearable terminal device, a personal digital assistant (PDA), a portable computer, a desktop computer, an image capture terminal device such as a digital camera, a gaming terminal device, a music storage and playback appliance, a vehicle-mounted wireless terminal device, a wireless endpoint, a mobile station, laptop-embedded equipment (LEE), laptop-mounted equipment (LME), a universal serial bus (USB) dongle, a smart device,

wireless customer-premises equipment (CPE), an internet of things (IoT) device, a watch or other wearable, a head-mounted display (HMD), a vehicle, a drone, a medical device (for example, a remote surgery device), an industrial device (for example, a robot and/or other wireless devices operating in an industrial and/or an automated processing chain contexts), a consumer electronics device, a device operating on commercial and/or industrial wireless networks, and the like. In the following description, the terms: “terminal device,” “communication device,” “terminal,” “user equipment” and “UE,” may be used interchangeably.

[0079] As discussed above, when a UE moves from one cell to another cell, at some point, a serving cell change needs to be performed. In the legacy, the serving cell change is performed by explicit radio resource control (RRC) reconfiguration signalling to trigger a synchronization of target cell based on L3 measurement reports. It leads to longer latency, larger overhead, and longer interruption time than beam-level mobility.

[0080] In the 3rd generation partnership project (3GPP), a new work item on further NR mobility enhancements, named as LTM, was approved to change a serving cell via L1/L2 signalling, in order to reduce the latency, overhead and interruption time during a cell switch. The LTM is a PCell (primary cell of a master cell group) or PSCell (primary cell of a secondary cell group) cell switch procedure that the network triggers via MAC CE based on L1 measurements. The potential applicable scenarios of LTM include intra-CU intra-DU mobility, intra-CU inter-DU mobility, and inter-CU mobility.

[0081] FIGS. 2A to 2C illustrate example scenarios of LTM associated with aspects of the present disclosure. FIG. 2A shows a scenario for intra-CU intra-DU LTM, FIG. 2B shows a scenario for intra-CU inter-DU LTM, and FIG. 2C shows a scenario for inter-CU inter-DU LTM.

[0082] As shown in FIG. 2A, in the scenario for intra-CU intra-DU LTM, the UE moves between different cells within the same DU. As shown in FIG. 2B, in the scenario for intra-CU inter-DU LTM, the UE moves between different cells belonging to different DUs but within the same CU. As shown in FIG. 2C, in the scenario for inter-CU LTM, the UE moves between different cells belonging to different DUs, where the different DUs belong to different CUs.

[0083] In the LTM, some concepts, e.g., LTM candidate cell, LTM candidate cell configuration, LTM reference configuration, and complete LTM candidate cell

configuration are proposed. The LTM candidate cell refers to a candidate cell configured to the UE for LTM. There may be multiple LTM candidate cells prepared for the UE, and these LTM candidate cells may belong to the same DU or different candidate DUs (including different candidate DUs belonging to different candidate CUs). The LTM candidate cell configuration, which may be also referred to as LTM delta configuration or candidate cell configuration for LTM, refers to a configuration associated with an LTM candidate cell. A LTM candidate cell configuration can be a complete LTM candidate cell configuration or a delta (difference) configuration with respect to a LTM reference configuration. Each LTM candidate cell configuration may be identified by an index, called as LTM candidate cell configuration index, LTM candidate configuration index, or other names. In one example, the LTM candidate cell configuration index may be *LTM-CandidateId*, which is used to identity an LTM candidate cell configuration.

[0084] Furthermore, the LTM reference configuration is a configuration provided by the network to the UE that is common to all the configured LTM candidate cells. The LTM reference configuration is used by the UE to generate a complete LTM candidate cell configuration (i.e., by applying an LTM candidate cell configuration on top of an LTM reference configuration, for example, to obtain sum of information of the LTM candidate cell configuration and the LTM reference configuration). The complete LTM candidate cell configuration refers to a configuration that contains all the necessary fields needed to perform an LTM cell switch procedure. The complete LTM candidate cell configuration may be a LTM candidate cell configuration itself or be generated by applying an LTM candidate cell configuration on top of an LTM reference configuration.

[0085] Considering inter-CU LTM, there are several issues should be considered as follows. The first issue is, the LTM reference configuration is managed separately different from the legacy handover based on the source cell configuration. It is unclear how to enable a candidate target node (which may refer to a candidate DU under the source CU, or a candidate DU under other CU) to provide the LTM candidate cell configuration.

[0086] The second issue is how to reduce signalling overhead for LTM preparation when multiple LTM candidate cells are within the same candidate target node. The third issue is, it is unclear how to support the LTM candidate cell configuration in the case that the LTM reference configuration is not provided by a source node, or the candidate target

node wants to use a new LTM reference configuration. Thus, it needs a solution to solve above issues to at least support inter-CU LTM.

[0087] The present disclosure proposes a solution to support candidate cell configuration for LTM. In this solution, one or more candidate cell configurations for LTM may be provided by the candidate target node to the source node during LTM preparation procedure, even the source node cannot provide a LTM reference configuration. In addition, the candidate target node may also provide a new LTM reference configuration it wants to use. Furthermore, the signalling overhead for LTM preparation is further reduced by implementing some embodiments of present disclosure.

[0088] Aspects of the present disclosure are described in the context of a wireless communications system.

[0089] FIG. 1 illustrates an example of a wireless communications system 100 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The wireless communications system 100 may include one or more network entities 102 (also referred to as network equipment (NE)), one or more UEs 104, a core network 106, and a packet data network 108. The wireless communications system 100 may support various radio access technologies. In some implementations, the wireless communications system 100 may be a 4G network, such as an LTE network or an LTE-advanced (LTE-A) network. In some other implementations, the wireless communications system 100 may be a 5G network, such as an NR network. In other implementations, the wireless communications system 100 may be a combination of a 4G network and a 5G network, or other suitable radio access technology including institute of electrical and electronics engineers (IEEE) 802.11 (Wi-Fi), IEEE 802.16 (WiMAX), IEEE 802.20. The wireless communications system 100 may support radio access technologies beyond 5G. Additionally, the wireless communications system 100 may support technologies, such as time division multiple access (TDMA), frequency division multiple access (FDMA), or code division multiple access (CDMA), etc.

[0090] The one or more network entities 102 may be dispersed throughout a geographic region to form the wireless communications system 100. One or more of the network entities 102 described herein may be or include or may be referred to as a network node, a base station, a network element, a radio access network (RAN), a base transceiver station, an access point, a NodeB, an eNodeB (eNB), a next-generation NodeB (gNB), or

other suitable terminology. A network entity 102 and a UE 104 may communicate via a communication link 110, which may be a wireless or wired connection. For example, a network entity 102 and a UE 104 may perform wireless communication (e.g., receive signaling, transmit signaling) over a Uu interface.

[0091] A network entity 102 may provide a geographic coverage area 112 for which the network entity 102 may support services (e.g., voice, video, packet data, messaging, broadcast, etc.) for one or more UEs 104 within the geographic coverage area 112. For example, a network entity 102 and a UE 104 may support wireless communication of signals related to services (e.g., voice, video, packet data, messaging, broadcast, etc.) according to one or multiple radio access technologies. In some implementations, a network entity 102 may be moveable, for example, a satellite associated with a non-terrestrial network. In some implementations, different geographic coverage areas 112 associated with the same or different radio access technologies may overlap, but the different geographic coverage areas 112 may be associated with different network entities 102. Information and signals described herein may be represented using any of a variety of different technologies and techniques. For example, data, instructions, commands, information, signals, bits, symbols, and chips that may be referenced throughout the description may be represented by voltages, currents, electromagnetic waves, magnetic fields or particles, optical fields or particles, or any combination thereof.

[0092] The one or more UEs 104 may be dispersed throughout a geographic region of the wireless communications system 100. A UE 104 may include or may be referred to as a mobile device, a wireless device, a remote device, a remote unit, a handheld device, or a subscriber device, or some other suitable terminology. In some implementations, the UE 104 may be referred to as a unit, a station, a terminal, or a client, among other examples. Additionally, or alternatively, the UE 104 may be referred to as an internet-of-things (IoT) device, an internet-of-everything (IoE) device, or machine-type communication (MTC) device, among other examples. In some implementations, a UE 104 may be stationary in the wireless communications system 100. In some other implementations, a UE 104 may be mobile in the wireless communications system 100.

[0093] The one or more UEs 104 may be devices in different forms or having different capabilities. Some examples of UEs 104 are illustrated in FIG. 1. A UE 104 may be capable of communicating with various types of devices, such as the network entities 102,

other UEs 104, or network equipment (e.g., the core network 106, the packet data network 108, a relay device, an integrated access and backhaul (IAB) node, or another network equipment), as shown in FIG. 1. Additionally, or alternatively, a UE 104 may support communication with other network entities 102 or UEs 104, which may act as relays in the wireless communications system 100.

[0094] A UE 104 may also be able to support wireless communication directly with other UEs 104 over a communication link 114. For example, a UE 104 may support wireless communication directly with another UE 104 over a device-to-device (D2D) communication link. In some implementations, such as vehicle-to-vehicle (V2V) deployments, vehicle-to-everything (V2X) deployments, or cellular-V2X deployments, the communication link 114 may be referred to as a sidelink. For example, a UE 104 may support wireless communication directly with another UE 104 over a PC5 interface.

[0095] A network entity 102 may support communications with the core network 106, or with another network entity 102, or both. For example, a network entity 102 may interface with the core network 106 through one or more backhaul links 116 (e.g., via an S1, N2, N2, or another network interface). The network entities 102 may communicate with each other over the backhaul links 116 (e.g., via an X2, Xn, or another network interface). In some implementations, the network entities 102 may communicate with each other directly (e.g., between the network entities 102). In some other implementations, the network entities 102 may communicate with each other or indirectly (e.g., via the core network 106). In some implementations, one or more network entities 102 may include subcomponents, such as an access network entity, which may be an example of an access node controller (ANC). An ANC may communicate with the one or more UEs 104 through one or more other access network transmission entities, which may be referred to as a radio heads, smart radio heads, or transmission-reception points (TRPs).

[0096] In some implementations, a network entity 102 may be configured in a disaggregated architecture, which may be configured to utilize a protocol stack physically or logically distributed among two or more network entities 102, such as an integrated access backhaul (IAB) network, an open radio access network (O-RAN) (e.g., a network configuration sponsored by the O-RAN Alliance), or a virtualized RAN (vRAN) (e.g., a cloud RAN (C-RAN)). For example, a network entity 102 may include one or more of a

CU, a DU, a radio unit (RU), a RAN intelligent controller (RIC) (e.g., a near-real time RIC (Near-RT RIC), a non-real time RIC (Non-RT RIC)), a service management and orchestration (SMO) system, or any combination thereof.

[0097] An RU may also be referred to as a radio head, a smart radio head, a remote radio head (RRH), a remote radio unit (RRU), or a transmission reception point (TRP). One or more components of the network entities 102 in a disaggregated RAN architecture may be co-located, or one or more components of the network entities 102 may be located in distributed locations (e.g., separate physical locations). In some implementations, one or more network entities 102 of a disaggregated RAN architecture may be implemented as virtual units (e.g., a virtual CU (VCU), a virtual DU (VDU), a virtual RU (VRU)).

[0098] Split of functionality between a CU, a DU, and an RU may be flexible and may support different functionalities depending upon which functions (e.g., network layer functions, protocol layer functions, baseband functions, radio frequency functions, and any combinations thereof) are performed at a CU, a DU, or an RU. For example, a functional split of a protocol stack may be employed between a CU and a DU such that the CU may support one or more layers of the protocol stack and the DU may support one or more different layers of the protocol stack. In some implementations, the CU may host upper protocol layer (e.g., a layer 3 (L3), a layer 2 (L2)) functionality and signaling (e.g., radio resource control (RRC), service data adaptation protocol (SDAP), packet data convergence protocol (PDCP)). The CU may be connected to one or more DUs or RUs, and the one or more DUs or RUs may host lower protocol layers, such as a layer 1 (L1) (e.g., physical (PHY) layer) or an L2 (e.g., radio link control (RLC) layer, medium access control (MAC) layer) functionality and signaling, and may each be at least partially controlled by the CU 160.

[0099] Additionally, or alternatively, a functional split of the protocol stack may be employed between a DU and an RU such that the DU may support one or more layers of the protocol stack and the RU may support one or more different layers of the protocol stack. The DU may support one or multiple different cells (e.g., via one or more RUs). In some implementations, a functional split between a CU and a DU, or between a DU and an RU may be within a protocol layer (e.g., some functions for a protocol layer may be performed by one of a CU, a DU, or an RU, while other functions of the protocol layer are performed by a different one of the CU, the DU, or the RU).

[0100] A CU may be functionally split further into CU control plane (CU-CP) and CU user plane (CU-UP) functions. A CU may be connected to one or more DUs via a midhaul communication link (e.g., F1, F1-c, F1-u), and a DU may be connected to one or more RUs via a fronthaul communication link (e.g., open fronthaul (FH) interface). In some implementations, a midhaul communication link or a fronthaul communication link may be implemented in accordance with an interface (e.g., a channel) between layers of a protocol stack supported by respective network entities 102 that are in communication via such communication links.

[0101] The core network 106 may support user authentication, access authorization, tracking, connectivity, and other access, routing, or mobility functions. The core network 106 may be an evolved packet core (EPC), or a 5G core (5GC), which may include a control plane entity that manages access and mobility (e.g., a mobility management entity (MME), an access and mobility management functions (AMF)) and a user plane entity that routes packets or interconnects to external networks (e.g., a serving gateway (S-GW), a packet data network (PDN) gateway (P-GW), or a user plane function (UPF)). In some implementations, the control plane entity may manage non-access stratum (NAS) functions, such as mobility, authentication, and bearer management (e.g., data bearers, signal bearers, etc.) for the one or more UEs 104 served by the one or more network entities 102 associated with the core network 106.

[0102] The core network 106 may communicate with the packet data network 108 over one or more backhaul links 116 (e.g., via an S1, N2, N2, or another network interface). The packet data network 108 may include an application server 118. In some implementations, one or more UEs 104 may communicate with the application server 118. A UE 104 may establish a session (e.g., a protocol data unit (PDU) session, or the like) with the core network 106 via a network entity 102. The core network 106 may route traffic (e.g., control information, data, and the like) between the UE 104 and the application server 118 using the established session (e.g., the established PDU session). The PDU session may be an example of a logical connection between the UE 104 and the core network 106 (e.g., one or more network functions of the core network 106).

[0103] In the wireless communications system 100, the network entities 102 and the UEs 104 may use resources of the wireless communications system 100 (e.g., time resources (e.g., symbols, slots, subframes, frames, or the like) or frequency resources (e.g.,

subcarriers, carriers)) to perform various operations (e.g., wireless communications). In some implementations, the network entities 102 and the UEs 104 may support different resource structures. For example, the network entities 102 and the UEs 104 may support different frame structures. In some implementations, such as in 4G, the network entities 102 and the UEs 104 may support a single frame structure. In some other implementations, such as in 5G and among other suitable radio access technologies, the network entities 102 and the UEs 104 may support various frame structures (i.e., multiple frame structures). The network entities 102 and the UEs 104 may support various frame structures based on one or more numerologies.

[0104] One or more numerologies may be supported in the wireless communications system 100, and a numerology may include a subcarrier spacing and a cyclic prefix. A first numerology (e.g., $\mu=0$) may be associated with a first subcarrier spacing (e.g., 15 kHz) and a normal cyclic prefix. In some implementations, the first numerology (e.g., $\mu=0$) associated with the first subcarrier spacing (e.g., 15 kHz) may utilize one slot per subframe. A second numerology (e.g., $\mu=1$) may be associated with a second subcarrier spacing (e.g., 30 kHz) and a normal cyclic prefix. A third numerology (e.g., $\mu=2$) may be associated with a third subcarrier spacing (e.g., 60 kHz) and a normal cyclic prefix or an extended cyclic prefix. A fourth numerology (e.g., $\mu=3$) may be associated with a fourth subcarrier spacing (e.g., 120 kHz) and a normal cyclic prefix. A fifth numerology (e.g., $\mu=4$) may be associated with a fifth subcarrier spacing (e.g., 240 kHz) and a normal cyclic prefix.

[0105] A time interval of a resource (e.g., a communication resource) may be organized according to frames (also referred to as radio frames). Each frame may have a duration, for example, a 10 millisecond (ms) duration. In some implementations, each frame may include multiple subframes. For example, each frame may include 10 subframes, and each subframe may have a duration, for example, a 1 ms duration. In some implementations, each frame may have the same duration. In some implementations, each subframe of a frame may have the same duration.

[0106] Additionally or alternatively, a time interval of a resource (e.g., a communication resource) may be organized according to slots. For example, a subframe may include a number (e.g., quantity) of slots. The number of slots in each subframe may also depend on the one or more numerologies supported in the wireless communications

system 100. For instance, the first, second, third, fourth, and fifth numerologies (i.e., $\mu=0$, $\mu=1$, $\mu=2$, $\mu=3$, $\mu=4$) associated with respective subcarrier spacings of 15 kHz, 30 kHz, 60 kHz, 120 kHz, and 240 kHz may utilize a single slot per subframe, two slots per subframe, four slots per subframe, eight slots per subframe, and 16 slots per subframe, respectively. Each slot may include a number (e.g., quantity) of symbols (e.g., OFDM symbols). In some implementations, the number (e.g., quantity) of slots for a subframe may depend on a numerology. For a normal cyclic prefix, a slot may include 14 symbols. For an extended cyclic prefix (e.g., applicable for 60 kHz subcarrier spacing), a slot may include 12 symbols. The relationship between the number of symbols per slot, the number of slots per subframe, and the number of slots per frame for a normal cyclic prefix and an extended cyclic prefix may depend on a numerology. It should be understood that reference to a first numerology (e.g., $\mu=0$) associated with a first subcarrier spacing (e.g., 15 kHz) may be used interchangeably between subframes and slots.

[0107] In the wireless communications system 100, an electromagnetic (EM) spectrum may be split, based on frequency or wavelength, into various classes, frequency bands, frequency channels, etc. By way of example, the wireless communications system 100 may support one or multiple operating frequency bands, such as frequency range designations FR1 (410 MHz – 7.125 GHz), FR2 (24.25 GHz – 52.6 GHz), FR3 (7.125 GHz – 24.25 GHz), FR4 (52.6 GHz – 114.25 GHz), FR4a or FR4-1 (52.6 GHz – 71 GHz), and FR5 (114.25 GHz – 300 GHz). In some implementations, the network entities 102 and the UEs 104 may perform wireless communications over one or more of the operating frequency bands. In some implementations, FR1 may be used by the network entities 102 and the UEs 104, among other equipment or devices for cellular communications traffic (e.g., control information, data). In some implementations, FR2 may be used by the network entities 102 and the UEs 104, among other equipment or devices for short-range, high data rate capabilities.

[0108] FR1 may be associated with one or multiple numerologies (e.g., at least three numerologies). For example, FR1 may be associated with a first numerology (e.g., $\mu=0$), which includes 15 kHz subcarrier spacing; a second numerology (e.g., $\mu=1$), which includes 30 kHz subcarrier spacing; and a third numerology (e.g., $\mu=2$), which includes 60 kHz subcarrier spacing. FR2 may be associated with one or multiple numerologies (e.g., at least 2 numerologies). For example, FR2 may be associated with a third

numerology (e.g., $\mu=2$), which includes 60 kHz subcarrier spacing; and a fourth numerology (e.g., $\mu=3$), which includes 120 kHz subcarrier spacing.

[0109] FIG. 3 illustrates an example signalling procedure 300 for supporting candidate cell configuration for LTM (that is, LTM candidate cell configuration) in accordance with aspects of the present disclosure. A source base station 102 shown in FIG. 3 is a base station for LTM (i.e., supporting LTM), and it may be, for example, a gNB, or other kinds of base station applicable for LTM.

[0110] As shown in FIG. 3, at step 302, the source base station 102 may determine one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations, and at step 304, the source base station 102 may transmit the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations to a UE 104. In some example embodiments, the one or more first LTM candidate cell configurations may be provided by a candidate target node for LTM (not shown in FIG. 3) based on the one or more first LTM reference configurations. The determination of the one or more first LTM reference configurations and the one or more LTM candidate cell configurations will be described in detail below.

[0111] In some example embodiments of present disclosure, the source base station 102 may transmit a first source UE identifier, a first cell identifier for requesting a first LTM candidate cell configuration, and one or more second LTM reference configurations to the candidate target node, thereby obtaining the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations, that is, the LTM reference configurations may be provided by the source base station 102. The detailed description regarding this case will be described below.

[0112] In some example embodiments, the one or more first LTM reference configurations may be the same as the one or more second LTM reference configurations. Alternatively, the one or more first LTM reference configurations may be part of the one or more second LTM reference configurations.

[0113] In some example embodiments, the source base station 102 may transmit, to the candidate target node, a first message including a first source UE identifier and one

or more second LTM reference configurations associated with the first source UE identifier and a first request message including a first source UE identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node. The first message may be transmitted before the first request message. In this case, for example, a message for responding to the first message may be further transmitted from the candidate target node and received by the source base station 102. In addition, the one or more second LTM reference configurations associated with the first source UE identifier may be stored by the candidate target node after the candidate target node receives the first message.

[0114] Alternatively, the source base station 102 may transmit, to the candidate target node, a first request message including a first source UE identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node, and the first request message may further include one or more second LTM reference configurations associated with the first source UE identifier. That is, the one or more second LTM reference configurations may be transmitted along with the first source UE identifier and the first cell identifier. In this case, for example, after receiving the first request message, the candidate target node may store the one or more second LTM reference configurations associated with the first source UE identifier.

[0115] Additionally or alternatively, the first request message may further include a first indicator to indicate the candidate target node to store the one or more second LTM reference configurations. That is, for example, the candidate target node may store the one or more second LTM reference configurations in the case that the first indicator is included in the first request message, and does not store the one or more second LTM reference configurations in the case that the first indicator is not included in the first request message. Additionally or alternatively, the candidate target node may store the one or more second LTM reference configurations in the case that the first indicator included in the first request message indicate to store these configurations, and does not store the one or more second LTM reference configurations in the case that the first indicator included in the first request message indicate not to store these configurations.

[0116] In some example embodiments, the one or more second LTM reference configurations may be included in the first request message as one or more corresponding

reference configuration information elements (IEs), that is, the one or more second LTM reference configurations may be included in the first request message as one or more explicit IEs. In this way, the candidate target node does not need to open the radio resource configuration as used in the source cell.

[0117] Alternatively, the one or more second LTM reference configurations may be included in a message embedded in the first request message. For example, the one or more second LTM reference configurations may be included in the Handover Preparation Information message embedded in the Handover Request message. As another example, the one or multiple second LTM reference configurations may be included in a RRC Reconfiguration container, the RRC Reconfiguration container is within a radio resource configuration used in the source cell, and the radio resource configuration used in the source cell is within the Handover Preparation Information message embedded in the Handover Request message. It should be noted that, other ways to carry the one or more second LTM reference configurations are also applicable.

[0118] In some example embodiments, after the first request message, the source base station 102 may receive, from the candidate target node, a first reply message including the first LTM candidate cell configuration. The first LTM candidate cell configuration may be also included in the LTM candidate cell configurations transmitted to the UE 104.

[0119] In some example embodiments, the first reply message may further include a first selected LTM reference configuration or an index of the first selected LTM reference configuration (i.e. LTM reference configuration index) in the case that the one or more second LTM reference configurations include multiple LTM reference configurations, and the first selected LTM reference configuration is a LTM reference configuration selected from the one or more second LTM reference configurations by the candidate target node for the first LTM candidate cell configuration. The first selected LTM reference configuration may be included in the LTM reference configurations transmitted to the UE 104. Alternatively, in the case that the one or more second LTM reference configurations include only one LTM reference configuration, the first reply message may not include the first selected LTM reference configuration or an index of the first selected LTM reference configuration (i.e., LTM reference configuration index).

[0120] In some example embodiments, after the first request message, the source base station 102 may further transmit, to the candidate target node, a second request message

including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the candidate target node, and may receive, from the candidate target node, a second reply messages including the second LTM candidate cell configuration determined based on the one or more second LTM reference configurations associated with the first source UE identifier. That is, by using the first source UE identifier, the one or more second LTM reference configurations associated with the first source UE identifier may be also applied to determine the second LTM candidate cell configuration. Similarly, the second LTM candidate cell configuration may be also included in the LTM candidate cell configurations transmitted to the UE 104.

[0121] In some example embodiments, the second reply message may further include a second selected LTM reference configuration or an index of the second selected LTM reference configuration, the second selected LTM reference configuration may be a LTM reference configuration selected from the one or more second LTM reference configurations by the candidate target node for the second LTM candidate cell configuration, and the second selected LTM reference configuration may be also included in the LTM reference configurations transmitted to the UE 104. Alternatively, in the case that the one or more second LTM reference configurations include only one LTM reference configuration, the second reply message may not include the second selected LTM reference configuration or an index of the second selected LTM reference configuration (i.e., LTM reference configuration index).

[0122] In some other example embodiments of present disclosure, the LTM reference configurations may also be provided by the candidate target node, rather than the source base station 102, for example, the candidate target node may use and/or provide some new LTM reference configurations different from LTM reference configurations provided by the source base station 102. The detailed description regarding this case will be described below. The following operations regarding the third request message/fourth request message are independent from above operations regarding the first request message/second request message, there is no limit to the perform order of them as long as there is no conflict.

[0123] In some example embodiments, the source base station 102 may transmit, to the candidate target node, a third request message including a third source UE identifier

and a third cell identifier for requesting a third LTM candidate cell configuration for a third LTM candidate cell belonging to the candidate target node, and receive, from the candidate target node, a third reply message including the third LTM candidate cell configuration. Herein, the third LTM candidate cell configuration may be determined by the candidate target node based on an additional LTM reference configuration provided by the candidate target node. The additional LTM reference configuration may be associated to the third source UE identifier, for example, in the case that it is determined as a LTM reference configuration with respect to the third LTM candidate cell configuration. Furthermore, the one or more first LTM candidate cell configurations transmitted to the UE 104 may also include the third LTM candidate cell configuration. Furthermore, the one or more first LTM reference configurations transmitted to the UE 104 may also include the additional LTM reference configuration.

[0124] In some example embodiments, the additional LTM reference configuration may be further included in the third reply message so as to be transmitted to the source base station 102. For example, the third request message may also include a second indicator to indicate the candidate target node to provide the additional LTM reference configuration.

[0125] In some example embodiments, the additional LTM reference configuration may be same as the third LTM candidate cell configuration, and the third reply message may include a third indicator to indicate that the additional LTM reference configuration is same as the third LTM candidate cell configuration. However, it should be noted that the additional LTM reference configuration may be different from the third LTM candidate cell configuration and it may be determined by the candidate target node in some other ways.

[0126] In some example embodiments, the third request message may further include one or more third LTM reference configurations associated with the third source UE identifier, and, different from the case of using the first request message described above, the candidate target node may provide an additional LTM reference configuration information different from the one or more third LTM reference configurations.

[0127] After transmitting the third request message, the candidate target node may further transmit, to the candidate target node, a fourth request message including the third source UE identifier and a fourth cell identifier for requesting a fourth LTM candidate

cell configuration for a fourth LTM candidate cell belonging to the candidate target node, and may receive, from the candidate target node, a fourth reply messages including the fourth LTM candidate cell configuration. Herein the fourth LTM candidate cell configuration may be determined by the candidate target node based on the additional LTM reference configuration associated with the third source UE identifier. Furthermore, the one or more first LTM candidate cell configurations transmitted to the UE 104 may also include the fourth LTM candidate cell configuration. Additionally, the fourth request message may further include the additional LTM reference configuration for use by the candidate target node.

[0128] In some example embodiments, the candidate target node may be a candidate base station for LTM, and the source UE identifiers, including the first, second, third and fourth source UE identifier, may be a source node UE Xn application protocol (XnAP) ID. Alternatively, the source base station 102 may include a source central unit (CU) and one or more distributed units (DUs), and the candidate target node may be a target DU among the one or more DU, in this case, the source UE identifiers, including the first, second, third and fourth source UE identifier, may be a CU UE F1 application protocol (F1AP) ID.

[0129] Referring to FIG. 3 again, at step 306, the UE 104 may receive, from the source base station 102, the one or more first LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations, and at step 308, the UE 104 may store the received one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations.

[0130] In some example embodiments, the one or more first LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations may be transmitted from the source base station 102 to the UE 104 via a reconfiguration message, for example, a RRC Reconfiguration message. As an example, the reconfiguration message may include one or more configuration information elements (IEs), e.g. LTM-Config IEs, each configuration IE may include one first LTM reference configuration and at least one LTM candidate cell configuration associated with the one first LTM reference configuration.

[0131] Alternatively or additionally, in addition to the one or more first LTM reference configurations and the one or more LTM candidate cell configurations, the reconfiguration message may further include one or more reference configuration list in which each of the one or more first LTM reference configurations is associated with at least one LTM candidate cell identifier (ID). Herein, the LTM candidate cell ID may be a physical cell ID (PCI), a new radio cell global ID (NCGI), or an index of a LTM candidate cell configuration (e.g., *LTM-CandidateId*), and the index of LTM candidate cell configuration indicates a LTM candidate cell configuration of the one or more first LTM candidate cell configurations.

[0132] FIG. 4 illustrates another example signalling procedure 400 for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure. FIG. 4 relates to the determination of the one or more first LTM reference configurations and the one or more LTM candidate cell configurations at step 302 in FIG.3.

[0133] As shown in FIG. 4, the signalling procedure 400 involves a first network device 102-1 and a second network device 102-2. The first network device 102-1 may be a candidate base station for LTM and the second network device 102-2 may be a source base station for LTM. Alternatively, the second network device 102-2 may be a source CU of a source base station for LTM and the first network device 102-1 may be a target DU among one or more DUs of the same source base station for LTM.

[0134] Referring to FIG. 4, at step 402, the first network device 102-1 may receive, from a second network device 102-2 for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the first network device, and at step 404, the first network device 102-1 may transmit, to the second network device 102-2, a first reply message including the first LTM candidate cell configuration, and the first LTM candidate cell configuration may be determined by the first network device 102-1 based on a first LTM reference configuration.

[0135] In some example embodiments, the first LTM reference configuration may be provided by the second network device 102-2. The detailed description regarding this case will be described below.

[0136] For example, the first network device 102-1 may further receive, from the second network device 102-2, a first message including the first source UE identifier and

one or more LTM reference configurations associated with the first source UE identifier, and store the one or more LTM reference configurations. The one or more LTM reference configurations may include the first LTM reference configuration. Additionally, after received the first message, the first network device 102-1 may transmit a message for responding to the first message to the second network device.

[0137] Alternatively, as another example, the first request message may further include one or more LTM reference configurations associated with the first source UE identifier, and the first LTM reference configuration may be one of the one or more LTM reference configurations. Additionally, the first request message may further include a first indicator to indicate the first network device 102-1 to store the one or more LTM reference configurations.

[0138] In some example embodiments, similar as described in FIG. 3, the one or more LTM reference configurations may be included in a message embedded in the first request message, or they may be included in the first request message as one or more corresponding reference configuration information elements (IEs).

[0139] In some example embodiments, the first LTM reference configuration may be selected from the one or more LTM reference configurations by the first network device 102-1 for the first LTM candidate cell configuration in the case that the one or more LTM reference configurations include multiple LTM reference configurations, and it (or the index of the first LTM reference configuration if each LTM reference configuration is associated with an index) may be included in the first reply message to be transmitted to the second network device 102-2.

[0140] In some example embodiments, after the step 404, if the first network device 102-1 receives, from the second network device 102-2, a second request message including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the candidate target node, the first network device 102-1 may transmit, to the second network device 102-2, a second reply messages including the second LTM candidate cell configuration determined based on the one or more LTM reference configurations associated with the first source UE identifier. Additionally, the second reply message may further include a second LTM reference configuration or an index of the second LTM reference configuration, and the second LTM reference configuration is a LTM reference

configuration selected from the one or more LTM reference configurations by the first network device for the second LTM candidate cell configuration.

[0141] In some other example embodiments, the first LTM reference configuration may be provided by the first network device 102-1, and it may be associated to the first source UE identifier transmitted by the second network device 102-2. The detailed description regarding this case will be described below.

[0142] For example, the first request message may further include a second indicator to indicate the first network device 102-1 to provide the first LTM reference configuration. Furthermore, the first LTM reference configuration may be included in the first reply message so as to be provided to the second network device.

[0143] In some other example embodiments, the first LTM reference configuration may be the same as the first LTM candidate cell configuration, and in this case, the first reply message may further include a third indicator to indicate that the first LTM reference configuration is same as the first LTM candidate cell configuration.

[0144] In some other example embodiments, the first request message may further include one or more LTM reference configurations associated with the first source UE identifier, the first network device 102-1 may provide a first LTM reference configuration different from the one or more LTM reference configurations.

[0145] In this case, if the first network device 102-1 receives, from the second network device 102-2, a second request message including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the first network device, the first network device 102-1 may transmit, to the second network device 102-2, the second reply messages including the second LTM candidate cell configuration determined by the second network device 102-2, for example, based on the first LTM reference configuration associated with the first source UE identifier. Additionally, the first LTM reference configuration may be included in the second request message to be provided to the first network device 102-1.

[0146] In some example embodiments, in the case that the first network device 102-1 is a candidate base station for LTM, and the second network device 102-2 is a source base station for LTM, each of the source UE identifiers mentioned above may be a source

node UE Xn application protocol (XnAP) identifier. Alternatively, in the case that first network device 102-1 is a target DU in a source base station for LTM, the second network device 102-2 is source CU of the source base station for LTM, each of the source UE identifiers mentioned above may be a CU UE F1 application protocol (F1AP) identifier.

[0147] FIG. 5 illustrates an example signalling procedure 500 for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure. FIG. 5 involves a UE 104, a source node 102-2 and a candidate target node 102-1. The source node 102-2 may refer to the source base station 102 in FIG. 3 or the second network device 102-2, and the candidate target node 102-1 may be the candidate target node in description regarding FIG. 3 or the first network device 102-1.

[0148] As shown in FIG. 5, at step 502, the source node 102-2 may request a LTM candidate cell configuration for a LTM candidate cell (e.g., LTM candidate cell 1 as shown in FIG. 5) by sending a Handover Request message, including a first source node UE XnAP ID allocated by the source node 102-2, a cell identifier of the LTM candidate cell 1 and one or multiple LTM reference configurations. A first indicator, which is used to indicate the candidate target node 201-1 to store the one or multiple LTM reference configurations, may be optionally included in the Handover Request message.

[0149] In an example, the one or multiple LTM reference configurations may be included in the Handover Request message as an explicit IE. In this way, the candidate target node 201-1 does not need to open the radio resource configuration as used in the source cell. In another example, the one or multiple LTM reference configurations may be included in Handover Preparation Information message embedded in the Handover Request message. Alternatively, the one or multiple LTM reference configurations may be included in a RRC Reconfiguration container, the RRC Reconfiguration container is within the radio resource configuration used in the source cell, and the radio resource configuration used in the source cell is within the Handover Preparation Information message embedded in the Handover Request message.

[0150] Furthermore, the Handover Request message may further include a first indicator, which indicates the one or multiple LTM reference configurations should be stored by the candidate target node 102-1 for the subsequent Handover Request of other LTM candidate cells for the same UE.

[0151] Alternatively, different from the Handover Request message as shown in FIG. 5, the source node 102-2 may send the one or multiple LTM reference configurations to the candidate target node 102-1 by another message, which also includes a first source node UE XnAP ID allocated by the source node. That is, in this case, the one or multiple LTM reference configurations are not included in the Handover Request message, but may be included in another message with first source node UE XnAP ID and transmitted to the candidate target node 102-1 before step 502.

[0152] In the case that the source node 102-2 sends one or multiple LTM reference configurations to the candidate target node 102-1 using a class-1 procedure (i.e., via a message other than the Handover Request message), the candidate target node 102-1 responds with a message to the source node 102-2 after receiving the one or multiple LTM reference configurations. In the case that the source node sends one or multiple LTM reference configurations to the candidate target node using a class-2 procedure (i.e., via the Handover Request message), the candidate target node 102-1 does not need to send a message to the source node after receiving the one or multiple LTM reference configurations.

[0153] Additionally, if there are multiple LTM reference configurations, each LTM reference configuration may be associated with an index, e.g., LTM reference configuration index.

[0154] At step 504, the candidate target node 102-1 sends a Handover Request Acknowledge message to the source node, including the LTM candidate cell configuration for the requested LTM candidate cell (e.g., LTM candidate cell 1).

[0155] In addition, at step 504, the candidate target node 102-1 may store the one or multiple LTM reference configurations for further use if the first indicator is included in the Handover Request message. Alternatively, if candidate target node 102-1 receives the one or multiple LTM reference configurations from the source node 102-2 in a new procedure defined in the step 502 (i.e. class-1 procedure), the candidate target node 102-1 may directly store the one or multiple LTM reference configurations for further use.

[0156] Furthermore, if the candidate target node 102-1 receives multiple LTM reference configurations in step 502, the Handover Request Acknowledge message may also include a selected LTM reference configuration determined by the candidate target node 102-1 for the LTM candidate cell 1 from the multiple LTM reference configurations.

Additionally, if the received multiple LTM reference configurations in step 502 are associated with indexes, the Handover Request Acknowledge message may include a LTM reference configuration index identifying the selected LTM reference configuration. Otherwise if the received multiple LTM reference configurations in step 5021 are not associated with indexes, the Handover Request Acknowledge message may include the selected LTM reference configuration as OCTET STRING.

[0157] At step 506, the source node 102-2 may request a LTM candidate cell configuration for another LTM candidate cell (e.g., the LTM candidate cell 2) by sending a Handover Request message. In one example, the Handover Request message at step 506 may include one or multiple LTM reference configurations, as illustrated by step 501. In another example, the Handover Request message may include the source node UE XnAP ID used for the one or multiple LTM reference configurations provision, e.g., the source node UE XnAP ID assigned by the source node 102-2 in step 502.

[0158] At step 508, the candidate target node 102-1 may send a Handover Request Acknowledge message to the source node 102-2, including the LTM candidate cell configuration for the requested LTM candidate cell (e.g., LTM candidate cell 2).

[0159] The Handover Request Acknowledge message at step 508 may also include a selected LTM reference configuration determined by the candidate target node for the LTM candidate cell 2 from the multiple LTM reference configurations, similar as step 504.

[0160] Steps 502 to 508 or steps 506 to 508 may be performed one or more times to obtain one or more LTM reference configurations and associated one or more LTM candidate cell configurations.

[0161] At step 510, the source node 102-2 sends a RRC Reconfiguration message to the UE, containing one or more LTM reference configurations and the associated one or more LTM candidate cell configurations. In one example, the RRC Reconfiguration message may contain one or multiple LTM-Config IEs, each LTM-Config IE is used to provide LTM candidate cell configurations. Each LTM-Config IE includes an LTM reference configuration, and the associated LTM candidate cell configurations based on the LTM reference configuration. In another example, the RRC Reconfiguration message may contain multiple LTM candidate cell configurations and one or multiple LTM reference configuration lists, each LTM reference configuration list contains a LTM

reference configuration and its associated LTM candidate cell IDs. The LTM candidate cell ID may be a PCI, NCGI or LTM candidate cell configuration index (e.g., *LTM-CandidateId*).

[0162] FIG. 6 illustrates an example signalling procedure 600 for supporting candidate cell configuration for LTM in accordance with aspects of the present disclosure. FIG. 6 involves a UE 104, a source node 102-2 and a candidate target node 102-1. The source node 102-2 may refer to the source base station 102 in FIG. 3 or the second network device 102-2, and the candidate target node 102-1 may be the candidate target node in description regarding FIG. 3 or the first network device 102-1.

[0163] As shown in FIG. 6, at step 602, the source node 102-2 may request a LTM candidate cell configuration for a LTM candidate cell (e.g., LTM candidate cell 1 as shown in FIG. 5) by sending a Handover Request message, including a first source node UE XnAP ID allocated by the source node 102-2, and a cell identifier of the LTM candidate cell 1.

[0164] In one example, the Handover Request message may also include one or multiple LTM reference configurations provided by the source node 102-2, as illustrated by step 502 in FIG. 5. As another example, the Handover Request message may include a second indicator, which indicates the candidate target node 102-1 to provide a new LTM reference configuration different from the provided LTM reference configuration(s).

[0165] Alternatively, the Handover Request message may not include an LTM reference configuration. In this case, a second indicator may be optionally included in the Handover Request message to indicate the candidate target node 102-1 to provide a new LTM reference configuration, or the candidate target node 102-1 may provide a new LTM reference configuration in default without the second indicator.

[0166] At step 604, the candidate target node 102-1 sends a Handover Request Acknowledge message to the source node 102-2, including the LTM candidate cell configuration for the requested LTM candidate cell (e.g., LTM candidate cell 1).

[0167] In addition, at step 604, if the candidate target node 102-1 wants to provide a new LTM reference configuration different from the one or multiple LTM reference configurations provided by the source node 102-2, or the second indicator is included in the step 602, the Handover Request Acknowledge message may also include the new

LTM reference configuration. Alternatively or additionally, if the LTM candidate cell configuration provided by the candidate target node 102-1 could be used as the new LTM reference configuration, a third indicator may be included in the Handover Request Acknowledge message, to indicate that the new LTM reference configuration is the same as the LTM candidate cell configuration. Additionally, the new LTM reference configuration may be associated to the source node UE XnAP ID provided in step 602

[0168] At step 606, the source node 102-2 may request a LTM candidate cell configuration for another LTM candidate cell (e.g., the LTM candidate cell 2) by sending a Handover Request message, including a cell identifier of the LTM candidate cell 2. In one example, the Handover Request message may further include the LTM reference configuration received in the step 604. In another example, the Handover Request message may further include the source node UE XnAP ID used for the LTM reference configurations provision, e.g., the source node UE XnAP ID in the step 602, and based on the source node UE XnAP ID in the step 602, the candidate target node 102-1 may use the new LTM reference configuration associated with the source node UE XnAP ID provided in step 602 for determining the LTM candidate cell configuration for LTM candidate cell 2.

[0169] At step 608, the candidate target node 102-1 may send a Handover Request Acknowledge message to the source node 102-2, including the LTM candidate cell configuration for the requested LTM candidate cell (e.g., LTM candidate cell 2).

[0170] Steps 602 to 608 or steps 606 to 608 may be performed one or more times to obtain one or more LTM reference configurations and associated one or more LTM candidate cell configurations.

[0171] At step 610, the source node 102-2 may send, to the UE 104, a RRC Reconfiguration message containing one or multiple LTM reference configurations and the associated LTM candidate cell configurations. Step 610 is similar as step 510 in FIG. 5 and thus the more detailed description regarding step 610 is omitted for brevity.

[0172] FIG. 7 illustrates an example of a device 700 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The device 700 may be an example of source base station for LTM as described herein. The device 700 may support wireless communication with UE 104 and a candidate base station. The device 700 may include components for bi-directional communications including

components for transmitting and receiving communications, such as a processor 702, a memory 704, a transceiver 706, and, optionally, an I/O controller 708. These components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more interfaces (e.g., buses).

[0173] The processor 702, the memory 704, the transceiver 706, or various combinations thereof or various components thereof may be examples of means for performing various aspects of the present disclosure as described herein. For example, the processor 702, the memory 704, the transceiver 706, or various combinations or components thereof may support a method for performing one or more of the operations described herein.

[0174] In some implementations, the processor 702, the memory 704, the transceiver 706, or various combinations or components thereof may be implemented in hardware (e.g., in communications management circuitry). The hardware may include a processor, a digital signal processor (DSP), an application-specific integrated circuit (ASIC), a field-programmable gate array (FPGA) or other programmable logic device, a discrete gate or transistor logic, discrete hardware components, or any combination thereof configured as or otherwise supporting a means for performing the functions described in the present disclosure. In some implementations, the processor 702 and the memory 704 coupled with the processor 702 may be configured to perform one or more of the functions described herein (e.g., executing, by the processor 702, instructions stored in the memory 704).

[0175] For example, the processor 702 may support wireless communication at the device 700 in accordance with examples as disclosed herein. The processor 702 may be configured to operable to support a means for determining one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; means for transmitting, via the transceiver 706 and to a UE 104, the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations, wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.

[0176] The processor 702 may include an intelligent hardware device (e.g., a general-purpose processor, a DSP, a CPU, a microcontroller, an ASIC, an FPGA, a programmable logic device, a discrete gate or transistor logic component, a discrete hardware component, or any combination thereof). In some implementations, the processor 702 may be configured to operate a memory array using a memory controller. In some other implementations, a memory controller may be integrated into the processor 702. The processor 702 may be configured to execute computer-readable instructions stored in a memory (e.g., the memory 704) to cause the device 700 to perform various functions of the present disclosure.

[0177] The memory 704 may include random access memory (RAM) and read-only memory (ROM). The memory 704 may store computer-readable, computer-executable code including instructions that, when executed by the processor 702 cause the device 700 to perform various functions described herein. The code may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. In some implementations, the code may not be directly executable by the processor 702 but may cause a computer (e.g., when compiled and executed) to perform functions described herein. In some implementations, the memory 704 may include, among other things, a basic I/O system (BIOS) which may control basic hardware or software operation such as the interaction with peripheral components or devices.

[0178] The I/O controller 708 may manage input and output signals for the device 700. The I/O controller 708 may also manage peripherals not integrated into the device 700. In some implementations, the I/O controller 708 may represent a physical connection or port to an external peripheral. In some implementations, the I/O controller 708 may utilize an operating system such as iOS®, ANDROID®, MS-WINDOWS®, OS/2®, UNIX®, LINUX®, or another known operating system. In some implementations, the I/O controller 708 may be implemented as part of a processor, such as the processor 706. In some implementations, a user may interact with the device 700 via the I/O controller 708 or via hardware components controlled by the I/O controller 708.

[0179] In some implementations, the device 700 may include a single antenna 710. However, in some other implementations, the device 700 may have more than one antenna 710 (i.e., multiple antennas), including multiple antenna panels or antenna arrays,

which may be capable of concurrently transmitting or receiving multiple wireless transmissions. The transceiver 706 may communicate bi-directionally, via the one or more antennas 710, wired, or wireless links as described herein. For example, the transceiver 706 may represent a wireless transceiver and may communicate bi-directionally with another wireless transceiver. The transceiver 706 may also include a modem to modulate the packets, to provide the modulated packets to one or more antennas 710 for transmission, and to demodulate packets received from the one or more antennas 710. The transceiver 706 may include one or more transmit chains, one or more receive chains, or a combination thereof.

[0180] A transmit chain may be configured to generate and transmit signals (e.g., control information, data, packets). The transmit chain may include at least one modulator for modulating data onto a carrier signal, preparing the signal for transmission over a wireless medium. The at least one modulator may be configured to support one or more techniques such as amplitude modulation (AM), frequency modulation (FM), or digital modulation schemes like phase-shift keying (PSK) or quadrature amplitude modulation (QAM). The transmit chain may also include at least one power amplifier configured to amplify the modulated signal to an appropriate power level suitable for transmission over the wireless medium. The transmit chain may also include one or more antennas 710 for transmitting the amplified signal into the air or wireless medium.

[0181] A receive chain may be configured to receive signals (e.g., control information, data, packets) over a wireless medium. For example, the receive chain may include one or more antennas 710 for receive the signal over the air or wireless medium. The receive chain may include at least one amplifier (e.g., a low-noise amplifier (LNA)) configured to amplify the received signal. The receive chain may include at least one demodulator configured to demodulate the receive signal and obtain the transmitted data by reversing the modulation technique applied during transmission of the signal. The receive chain may include at least one decoder for decoding the processing the demodulated signal to receive the transmitted data.

[0182] FIG. 8 illustrates an example of a device 800 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The device 800 may be an example of a first network device 102-1 as described herein. The device 800 may support wireless communication with one or more network entities 102 (for

example, the second network device 102-2). The device 800 may include components for bi-directional communications including components for transmitting and receiving communications, such as a processor 802, a memory 804, a transceiver 806, and, optionally, an I/O controller 808. These components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more interfaces (e.g., buses).

[0183] The processor 802, the memory 804, the transceiver 806, or various combinations thereof or various components thereof may be examples of means for performing various aspects of the present disclosure as described herein. For example, the processor 802, the memory 804, the transceiver 806, or various combinations or components thereof may support a method for performing one or more of the operations described herein.

[0184] In some implementations, the processor 802, the memory 804, the transceiver 806, or various combinations or components thereof may be implemented in hardware (e.g., in communications management circuitry). The hardware may include a processor, a digital signal processor (DSP), an application-specific integrated circuit (ASIC), a field-programmable gate array (FPGA) or other programmable logic device, a discrete gate or transistor logic, discrete hardware components, or any combination thereof configured as or otherwise supporting a means for performing the functions described in the present disclosure. In some implementations, the processor 802 and the memory 804 coupled with the processor 802 may be configured to perform one or more of the functions described herein (e.g., executing, by the processor 802, instructions stored in the memory 804).

[0185] For example, the processor 802 may support wireless communication at the device 800 in accordance with examples as disclosed herein. The processor 802 may be configured to operable to support a means for receiving, via the transceiver 806 and from a second network device 102-2 for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the first network device; and means for transmitting, via the transceiver 806 and to the second network device 102-2, a first reply message including the first LTM candidate cell configuration, wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

[0186] The processor 802 may include an intelligent hardware device (e.g., a general-purpose processor, a DSP, a CPU, a microcontroller, an ASIC, an FPGA, a programmable logic device, a discrete gate or transistor logic component, a discrete hardware component, or any combination thereof). In some implementations, the processor 802 may be configured to operate a memory array using a memory controller. In some other implementations, a memory controller may be integrated into the processor 802. The processor 802 may be configured to execute computer-readable instructions stored in a memory (e.g., the memory 804) to cause the device 800 to perform various functions of the present disclosure.

[0187] The memory 804 may include random access memory (RAM) and read-only memory (ROM). The memory 804 may store computer-readable, computer-executable code including instructions that, when executed by the processor 802 cause the device 800 to perform various functions described herein. The code may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. In some implementations, the code may not be directly executable by the processor 802 but may cause a computer (e.g., when compiled and executed) to perform functions described herein. In some implementations, the memory 804 may include, among other things, a basic I/O system (BIOS) which may control basic hardware or software operation such as the interaction with peripheral components or devices.

[0188] The I/O controller 808 may manage input and output signals for the device 800. The I/O controller 808 may also manage peripherals not integrated into the device 800. In some implementations, the I/O controller 808 may represent a physical connection or port to an external peripheral. In some implementations, the I/O controller 808 may utilize an operating system such as iOS®, ANDROID®, MS-WINDOWS®, OS/2®, UNIX®, LINUX®, or another known operating system. In some implementations, the I/O controller 808 may be implemented as part of a processor, such as the processor 806. In some implementations, a user may interact with the device 800 via the I/O controller 808 or via hardware components controlled by the I/O controller 808.

[0189] In some implementations, the device 800 may include a single antenna 610. However, in some other implementations, the device 800 may have more than one antenna 610 (i.e., multiple antennas), including multiple antenna panels or antenna arrays,

which may be capable of concurrently transmitting or receiving multiple wireless transmissions. The transceiver 806 may communicate bi-directionally, via the one or more antennas 610, wired, or wireless links as described herein. For example, the transceiver 806 may represent a wireless transceiver and may communicate bi-directionally with another wireless transceiver. The transceiver 806 may also include a modem to modulate the packets, to provide the modulated packets to one or more antennas 610 for transmission, and to demodulate packets received from the one or more antennas 610. The transceiver 806 may include one or more transmit chains, one or more receive chains, or a combination thereof.

[0190] A transmit chain may be configured to generate and transmit signals (e.g., control information, data, packets). The transmit chain may include at least one modulator for modulating data onto a carrier signal, preparing the signal for transmission over a wireless medium. The at least one modulator may be configured to support one or more techniques such as amplitude modulation (AM), frequency modulation (FM), or digital modulation schemes like phase-shift keying (PSK) or quadrature amplitude modulation (QAM). The transmit chain may also include at least one power amplifier configured to amplify the modulated signal to an appropriate power level suitable for transmission over the wireless medium. The transmit chain may also include one or more antennas 610 for transmitting the amplified signal into the air or wireless medium.

[0191] A receive chain may be configured to receive signals (e.g., control information, data, packets) over a wireless medium. For example, the receive chain may include one or more antennas 610 for receive the signal over the air or wireless medium. The receive chain may include at least one amplifier (e.g., a low-noise amplifier (LNA)) configured to amplify the received signal. The receive chain may include at least one demodulator configured to demodulate the receive signal and obtain the transmitted data by reversing the modulation technique applied during transmission of the signal. The receive chain may include at least one decoder for decoding the processing the demodulated signal to receive the transmitted data.

[0192] FIG. 9 illustrates an example of a device 900 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The device 900 may be an example of a UE 104 as described herein. The device 900 may support wireless communication with one or more network entities 102 (for example, the source

base station 102, the second network device 102-2). The device 900 may include components for bi-directional communications including components for transmitting and receiving communications, such as a processor 902, a memory 904, a transceiver 906, and, optionally, an I/O controller 908. These components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more interfaces (e.g., buses).

[0193] The processor 902, the memory 904, the transceiver 906, or various combinations thereof or various components thereof may be examples of means for performing various aspects of the present disclosure as described herein. For example, the processor 902, the memory 904, the transceiver 906, or various combinations or components thereof may support a method for performing one or more of the operations described herein.

[0194] In some implementations, the processor 902, the memory 904, the transceiver 906, or various combinations or components thereof may be implemented in hardware (e.g., in communications management circuitry). The hardware may include a processor, a digital signal processor (DSP), an application-specific integrated circuit (ASIC), a field-programmable gate array (FPGA) or other programmable logic device, a discrete gate or transistor logic, discrete hardware components, or any combination thereof configured as or otherwise supporting a means for performing the functions described in the present disclosure. In some implementations, the processor 902 and the memory 904 coupled with the processor 902 may be configured to perform one or more of the functions described herein (e.g., executing, by the processor 902, instructions stored in the memory 904).

[0195] For example, the processor 902 may support wireless communication at the device 900 in accordance with examples as disclosed herein. The processor 902 may be configured to operable to support a means for receiving, via the transceiver 906 and from a source base station 102 for LTM, one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations; and means for storing the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.

[0196] The processor 902 may include an intelligent hardware device (e.g., a general-purpose processor, a DSP, a CPU, a microcontroller, an ASIC, an FPGA, a programmable logic device, a discrete gate or transistor logic component, a discrete hardware component, or any combination thereof). In some implementations, the processor 902 may be configured to operate a memory array using a memory controller. In some other implementations, a memory controller may be integrated into the processor 902. The processor 902 may be configured to execute computer-readable instructions stored in a memory (e.g., the memory 904) to cause the device 900 to perform various functions of the present disclosure.

[0197] The memory 904 may include random access memory (RAM) and read-only memory (ROM). The memory 904 may store computer-readable, computer-executable code including instructions that, when executed by the processor 902 cause the device 900 to perform various functions described herein. The code may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. In some implementations, the code may not be directly executable by the processor 902 but may cause a computer (e.g., when compiled and executed) to perform functions described herein. In some implementations, the memory 904 may include, among other things, a basic I/O system (BIOS) which may control basic hardware or software operation such as the interaction with peripheral components or devices.

[0198] The I/O controller 908 may manage input and output signals for the device 900. The I/O controller 908 may also manage peripherals not integrated into the device 900. In some implementations, the I/O controller 908 may represent a physical connection or port to an external peripheral. In some implementations, the I/O controller 908 may utilize an operating system such as iOS®, ANDROID®, MS-WINDOWS®, OS/2®, UNIX®, LINUX®, or another known operating system. In some implementations, the I/O controller 908 may be implemented as part of a processor, such as the processor 906. In some implementations, a user may interact with the device 900 via the I/O controller 908 or via hardware components controlled by the I/O controller 908.

[0199] In some implementations, the device 900 may include a single antenna 610. However, in some other implementations, the device 900 may have more than one antenna 610 (i.e., multiple antennas), including multiple antenna panels or antenna arrays,

which may be capable of concurrently transmitting or receiving multiple wireless transmissions. The transceiver 906 may communicate bi-directionally, via the one or more antennas 610, wired, or wireless links as described herein. For example, the transceiver 906 may represent a wireless transceiver and may communicate bi-directionally with another wireless transceiver. The transceiver 906 may also include a modem to modulate the packets, to provide the modulated packets to one or more antennas 610 for transmission, and to demodulate packets received from the one or more antennas 610. The transceiver 906 may include one or more transmit chains, one or more receive chains, or a combination thereof.

[0200] A transmit chain may be configured to generate and transmit signals (e.g., control information, data, packets). The transmit chain may include at least one modulator for modulating data onto a carrier signal, preparing the signal for transmission over a wireless medium. The at least one modulator may be configured to support one or more techniques such as amplitude modulation (AM), frequency modulation (FM), or digital modulation schemes like phase-shift keying (PSK) or quadrature amplitude modulation (QAM). The transmit chain may also include at least one power amplifier configured to amplify the modulated signal to an appropriate power level suitable for transmission over the wireless medium. The transmit chain may also include one or more antennas 610 for transmitting the amplified signal into the air or wireless medium.

[0201] A receive chain may be configured to receive signals (e.g., control information, data, packets) over a wireless medium. For example, the receive chain may include one or more antennas 610 for receive the signal over the air or wireless medium. The receive chain may include at least one amplifier (e.g., a low-noise amplifier (LNA)) configured to amplify the received signal. The receive chain may include at least one demodulator configured to demodulate the receive signal and obtain the transmitted data by reversing the modulation technique applied during transmission of the signal. The receive chain may include at least one decoder for decoding the processing the demodulated signal to receive the transmitted data.

[0202] FIG. 10 illustrates an example of a processor 1000 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The processor 1000 may be an example of a processor configured to perform various operations in accordance with examples as described herein. The processor 1000 may include a controller 1002 configured to perform various operations in accordance with

examples as described herein. The processor 1000 may optionally include at least one memory 1004, such as L1/L2/L3 cache. Additionally, or alternatively, the processor 1000 may optionally include one or more arithmetic-logic units (ALUs) 1000. One or more of these components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more interfaces (e.g., buses).

[0203] The processor 1000 may be a processor chipset and include a protocol stack (e.g., a software stack) executed by the processor chipset to perform various operations (e.g., receiving, obtaining, retrieving, transmitting, outputting, forwarding, storing, determining, identifying, accessing, writing, reading) in accordance with examples as described herein. The processor chipset may include one or more cores, one or more caches (e.g., memory local to or included in the processor chipset (e.g., the processor 1000) or other memory (e.g., random access memory (RAM), read-only memory (ROM), dynamic RAM (DRAM), synchronous dynamic RAM (SDRAM), static RAM (SRAM), ferroelectric RAM (FeRAM), magnetic RAM (MRAM), resistive RAM (RRAM), flash memory, phase change memory (PCM), and others).

[0204] The controller 1002 may be configured to manage and coordinate various operations (e.g., signaling, receiving, obtaining, retrieving, transmitting, outputting, forwarding, storing, determining, identifying, accessing, writing, reading) of the processor 1000 to cause the processor 1000 to support various operations of a base station in accordance with examples as described herein. For example, the controller 1002 may operate as a control unit of the processor 1000, generating control signals that manage the operation of various components of the processor 1000. These control signals include enabling or disabling functional units, selecting data paths, initiating memory access, and coordinating timing of operations.

[0205] The controller 1002 may be configured to fetch (e.g., obtain, retrieve, receive) instructions from the memory 1004 and determine subsequent instruction(s) to be executed to cause the processor 1000 to support various operations in accordance with examples as described herein. The controller 1002 may be configured to track memory address of instructions associated with the memory 1004. The controller 1002 may be configured to decode instructions to determine the operation to be performed and the operands involved. For example, the controller 1002 may be configured to interpret the

instruction and determine control signals to be output to other components of the processor 1000 to cause the processor 1000 to support various operations in accordance with examples as described herein. Additionally, or alternatively, the controller 1002 may be configured to manage flow of data within the processor 1000. The controller 1002 may be configured to control transfer of data between registers, arithmetic logic units (ALUs), and other functional units of the processor 1000.

[0206] The memory 1004 may include one or more caches (e.g., memory local to or included in the processor 1000 or other memory, such RAM, ROM, DRAM, SDRAM, SRAM, MRAM, flash memory, etc. In some implementation, the memory 1004 may reside within or on a processor chipset (e.g., local to the processor 1000). In some other implementations, the memory 1004 may reside external to the processor chipset (e.g., remote to the processor 1000).

[0207] The memory 1004 may store computer-readable, computer-executable code including instructions that, when executed by the processor 1000, cause the processor 1000 to perform various functions described herein. The code may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. The controller 1002 and/or the processor 1000 may be configured to execute computer-readable instructions stored in the memory 1004 to cause the processor 1000 to perform various functions. For example, the processor 1000 and/or the controller 1002 may be coupled with or to the memory 1004, and the processor 1000, the controller 1002, and the memory 1004 may be configured to perform various functions described herein. In some examples, the processor 1000 may include multiple processors and the memory 1004 may include multiple memories. One or more of the multiple processors may be coupled with one or more of the multiple memories, which may, individually or collectively, be configured to perform various functions herein.

[0208] The one or more ALUs 1000 may be configured to support various operations in accordance with examples as described herein. In some implementation, the one or more ALUs 1000 may reside within or on a processor chipset (e.g., the processor 1000). In some other implementations, the one or more ALUs 1000 may reside external to the processor chipset (e.g., the processor 1000). One or more ALUs 1000 may perform one or more computations such as addition, subtraction, multiplication, and division on data. For example, one or more ALUs 1000 may receive input operands and an operation code,

which determines an operation to be executed. One or more ALUs 1000 be configured with a variety of logical and arithmetic circuits, including adders, subtractors, shifters, and logic gates, to process and manipulate the data according to the operation. Additionally, or alternatively, the one or more ALUs 1000 may support logical operations such as AND, OR, exclusive-OR (XOR), not-OR (NOR), and not-AND (NAND), enabling the one or more ALUs 1000 to handle conditional operations, comparisons, and bitwise operations.

[0209] The processor 1000 may support wireless communication in accordance with examples as disclosed herein. The processor 1000 may be configured to or operable to support a means for determining one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; and means for transmitting, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations, wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.

[0210] FIG. 11 illustrates an example of a processor 1100 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The processor 1100 may be an example of a processor configured to perform various operations in accordance with examples as described herein. The processor 1100 may include a controller 1102 configured to perform various operations in accordance with examples as described herein. The processor 1100 may optionally include at least one memory 1104, such as L1/L2/L3 cache. Additionally, or alternatively, the processor 1100 may optionally include one or more arithmetic-logic units (ALUs) 1100. One or more of these components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more interfaces (e.g., buses).

[0211] The processor 1100 may be a processor chipset and include a protocol stack (e.g., a software stack) executed by the processor chipset to perform various operations (e.g., receiving, obtaining, retrieving, transmitting, outputting, forwarding, storing, determining, identifying, accessing, writing, reading) in accordance with examples as described herein. The processor chipset may include one or more cores, one or more

caches (e.g., memory local to or included in the processor chipset (e.g., the processor 1100) or other memory (e.g., random access memory (RAM), read-only memory (ROM), dynamic RAM (DRAM), synchronous dynamic RAM (SDRAM), static RAM (SRAM), ferroelectric RAM (FeRAM), magnetic RAM (MRAM), resistive RAM (RRAM), flash memory, phase change memory (PCM), and others).

[0212] The controller 1102 may be configured to manage and coordinate various operations (e.g., signaling, receiving, obtaining, retrieving, transmitting, outputting, forwarding, storing, determining, identifying, accessing, writing, reading) of the processor 1100 to cause the processor 1100 to support various operations of a UE in accordance with examples as described herein. For example, the controller 1102 may operate as a control unit of the processor 1100, generating control signals that manage the operation of various components of the processor 1100. These control signals include enabling or disabling functional units, selecting data paths, initiating memory access, and coordinating timing of operations.

[0213] The controller 1102 may be configured to fetch (e.g., obtain, retrieve, receive) instructions from the memory 1104 and determine subsequent instruction(s) to be executed to cause the processor 1100 to support various operations in accordance with examples as described herein. The controller 1102 may be configured to track memory address of instructions associated with the memory 1104. The controller 1102 may be configured to decode instructions to determine the operation to be performed and the operands involved. For example, the controller 1102 may be configured to interpret the instruction and determine control signals to be output to other components of the processor 1100 to cause the processor 1100 to support various operations in accordance with examples as described herein. Additionally, or alternatively, the controller 1102 may be configured to manage flow of data within the processor 1100. The controller 1102 may be configured to control transfer of data between registers, arithmetic logic units (ALUs), and other functional units of the processor 1100.

[0214] The memory 1104 may include one or more caches (e.g., memory local to or included in the processor 1100 or other memory, such RAM, ROM, DRAM, SDRAM, SRAM, MRAM, flash memory, etc. In some implementation, the memory 1104 may reside within or on a processor chipset (e.g., local to the processor 1100). In some other

implementations, the memory 1104 may reside external to the processor chipset (e.g., remote to the processor 1100).

[0215] The memory 1104 may store computer-readable, computer-executable code including instructions that, when executed by the processor 1100, cause the processor 1100 to perform various functions described herein. The code may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. The controller 1102 and/or the processor 1100 may be configured to execute computer-readable instructions stored in the memory 1104 to cause the processor 1100 to perform various functions. For example, the processor 1100 and/or the controller 1102 may be coupled with or to the memory 1104, and the processor 1100, the controller 1102, and the memory 1104 may be configured to perform various functions described herein. In some examples, the processor 1100 may include multiple processors and the memory 1104 may include multiple memories. One or more of the multiple processors may be coupled with one or more of the multiple memories, which may, individually or collectively, be configured to perform various functions herein.

[0216] The one or more ALUs 1100 may be configured to support various operations in accordance with examples as described herein. In some implementation, the one or more ALUs 1100 may reside within or on a processor chipset (e.g., the processor 1100). In some other implementations, the one or more ALUs 1100 may reside external to the processor chipset (e.g., the processor 1100). One or more ALUs 1100 may perform one or more computations such as addition, subtraction, multiplication, and division on data. For example, one or more ALUs 1100 may receive input operands and an operation code, which determines an operation to be executed. One or more ALUs 1100 be configured with a variety of logical and arithmetic circuits, including adders, subtractors, shifters, and logic gates, to process and manipulate the data according to the operation. Additionally, or alternatively, the one or more ALUs 1100 may support logical operations such as AND, OR, exclusive-OR (XOR), not-OR (NOR), and not-AND (NAND), enabling the one or more ALUs 1100 to handle conditional operations, comparisons, and bitwise operations.

The processor 1100 may support wireless communication in accordance with examples as disclosed herein. The processor 1100 may be configured to or operable to support a means for receiving, via the transceiver and from a second network device for LTM, a first request message including a first source user equipment (UE) identifier and

a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node; and means for transmitting, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration, wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

[0217] FIG. 12 illustrates an example of a processor 1200 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The processor 1200 may be an example of a processor configured to perform various operations in accordance with examples as described herein. The processor 1200 may include a controller 1202 configured to perform various operations in accordance with examples as described herein. The processor 1200 may optionally include at least one memory 1204, such as L1/L2/L3 cache. Additionally, or alternatively, the processor 1200 may optionally include one or more arithmetic-logic units (ALUs) 1200. One or more of these components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more interfaces (e.g., buses).

[0218] The processor 1200 may be a processor chipset and include a protocol stack (e.g., a software stack) executed by the processor chipset to perform various operations (e.g., receiving, obtaining, retrieving, transmitting, outputting, forwarding, storing, determining, identifying, accessing, writing, reading) in accordance with examples as described herein. The processor chipset may include one or more cores, one or more caches (e.g., memory local to or included in the processor chipset (e.g., the processor 1200) or other memory (e.g., random access memory (RAM), read-only memory (ROM), dynamic RAM (DRAM), synchronous dynamic RAM (SDRAM), static RAM (SRAM), ferroelectric RAM (FeRAM), magnetic RAM (MRAM), resistive RAM (RRAM), flash memory, phase change memory (PCM), and others).

[0219] The controller 1202 may be configured to manage and coordinate various operations (e.g., signaling, receiving, obtaining, retrieving, transmitting, outputting, forwarding, storing, determining, identifying, accessing, writing, reading) of the processor 1200 to cause the processor 1200 to support various operations of a UE in accordance with examples as described herein. For example, the controller 1202 may

operate as a control unit of the processor 1200, generating control signals that manage the operation of various components of the processor 1200. These control signals include enabling or disabling functional units, selecting data paths, initiating memory access, and coordinating timing of operations.

[0220] The controller 1202 may be configured to fetch (e.g., obtain, retrieve, receive) instructions from the memory 1204 and determine subsequent instruction(s) to be executed to cause the processor 1200 to support various operations in accordance with examples as described herein. The controller 1202 may be configured to track memory address of instructions associated with the memory 1204. The controller 1202 may be configured to decode instructions to determine the operation to be performed and the operands involved. For example, the controller 1202 may be configured to interpret the instruction and determine control signals to be output to other components of the processor 1200 to cause the processor 1200 to support various operations in accordance with examples as described herein. Additionally, or alternatively, the controller 1202 may be configured to manage flow of data within the processor 1200. The controller 1202 may be configured to control transfer of data between registers, arithmetic logic units (ALUs), and other functional units of the processor 1200.

[0221] The memory 1204 may include one or more caches (e.g., memory local to or included in the processor 1200 or other memory, such RAM, ROM, DRAM, SDRAM, SRAM, MRAM, flash memory, etc. In some implementation, the memory 1204 may reside within or on a processor chipset (e.g., local to the processor 1200). In some other implementations, the memory 1204 may reside external to the processor chipset (e.g., remote to the processor 1200).

[0222] The memory 1204 may store computer-readable, computer-executable code including instructions that, when executed by the processor 1200, cause the processor 1200 to perform various functions described herein. The code may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. The controller 1202 and/or the processor 1200 may be configured to execute computer-readable instructions stored in the memory 1204 to cause the processor 1200 to perform various functions. For example, the processor 1200 and/or the controller 1202 may be coupled with or to the memory 1204, and the processor 1200, the controller 1202, and the memory 1204 may be configured to perform various functions described herein. In some

examples, the processor 1200 may include multiple processors and the memory 1204 may include multiple memories. One or more of the multiple processors may be coupled with one or more of the multiple memories, which may, individually or collectively, be configured to perform various functions herein.

[0223] The one or more ALUs 1200 may be configured to support various operations in accordance with examples as described herein. In some implementation, the one or more ALUs 1200 may reside within or on a processor chipset (e.g., the processor 1200). In some other implementations, the one or more ALUs 1200 may reside external to the processor chipset (e.g., the processor 1200). One or more ALUs 1200 may perform one or more computations such as addition, subtraction, multiplication, and division on data. For example, one or more ALUs 1200 may receive input operands and an operation code, which determines an operation to be executed. One or more ALUs 1200 be configured with a variety of logical and arithmetic circuits, including adders, subtractors, shifters, and logic gates, to process and manipulate the data according to the operation. Additionally, or alternatively, the one or more ALUs 1200 may support logical operations such as AND, OR, exclusive-OR (XOR), not-OR (NOR), and not-AND (NAND), enabling the one or more ALUs 1200 to handle conditional operations, comparisons, and bitwise operations.

The processor 1200 may support wireless communication in accordance with examples as disclosed herein. The processor 1200 may be configured to or operable to support a means for receiving, via the transceiver and from a source base station for LTM, one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations; and means for storing the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.

[0224] FIG. 13 illustrates a flowchart of a method 1300 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The operations of the method 1300 may be implemented by a device or its components as described herein. For example, the operations of the method 1300 may be performed by a source base station 102 as described herein. In some implementations, the device may

execute a set of instructions to control the function elements of the device to perform the described functions. Additionally, or alternatively, the device may perform aspects of the described functions using special-purpose hardware.

[0225] At 1305, the method may include determining one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations, the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations. The operations of 1305 may be performed in accordance with examples as described herein. In some implementations, aspects of the operations of 1305 may be performed by a device as described with reference to FIG. 1.

[0226] At 1310, the method may include transmitting, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations. The operations of 1310 may be performed in accordance with examples as described herein. In some implementations, aspects of the operations of 1310 may be performed by a device as described with reference to FIG. 1.

[0227] FIG. 14 illustrates a flowchart of a method 1400 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The operations of the method 1400 may be implemented by a device or its components as described herein. For example, the operations of the method 1400 may be performed by a first network device 102-1 as described herein. In some implementations, the device may execute a set of instructions to control the function elements of the device to perform the described functions. Additionally, or alternatively, the device may perform aspects of the described functions using special-purpose hardware.

[0228] At 1405, the method may include receiving, via the transceiver and from a second network device for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node. The operations of 1405 may be performed in accordance with examples as described herein. In some implementations, aspects of the operations of 1405 may be performed by a device as described with reference to FIG. 1.

[0229] At 1410, the method may include transmitting, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration, the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration. The operations of 1410 may be performed in accordance with examples as described herein. In some implementations, aspects of the operations of 1410 may be performed by a device as described with reference to FIG. 1.

[0230] FIG. 15 illustrates a flowchart of a method 1500 that supports candidate cell configuration for LTM in accordance with aspects of the present disclosure. The operations of the method 1500 may be implemented by a device or its components as described herein. For example, the operations of the method 1500 may be performed by a UE 104 as described herein. In some implementations, the device may execute a set of instructions to control the function elements of the device to perform the described functions. Additionally, or alternatively, the device may perform aspects of the described functions using special-purpose hardware.

[0231] At 1505, the method may include receiving, via the transceiver and from a second network device for LTM, a first request message including receiving, via the transceiver and from a source base station for LTM, one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations. The operations of 1505 may be performed in accordance with examples as described herein. In some implementations, aspects of the operations of 1505 may be performed by a device as described with reference to FIG. 1.

[0232] At 1510, the method may include storing the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations. The operations of 1510 may be performed in accordance with examples as described herein. In some implementations, aspects of the operations of 1510 may be performed by a device as described with reference to FIG. 1.

[0233] It should be noted that the methods described herein describes possible implementations, and that the operations and the steps may be rearranged or otherwise

modified and that other implementations are possible. Further, aspects from two or more of the methods may be combined.

[0234] The various illustrative blocks and components described in connection with the disclosure herein may be implemented or performed with a general-purpose processor, a DSP, an ASIC, a CPU, an FPGA or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof designed to perform the functions described herein. A general-purpose processor may be a microprocessor, but in the alternative, the processor may be any processor, controller, microcontroller, or state machine. A processor may also be implemented as a combination of computing devices (e.g., a combination of a DSP and a microprocessor, multiple microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration).

[0235] The functions described herein may be implemented in hardware, software executed by a processor, firmware, or any combination thereof. If implemented in software executed by a processor, the functions may be stored on or transmitted over as one or more instructions or code on a computer-readable medium. Other examples and implementations are within the scope of the disclosure and appended claims. For example, due to the nature of software, functions described herein may be implemented using software executed by a processor, hardware, firmware, hardwiring, or combinations of any of these. Features implementing functions may also be physically located at various positions, including being distributed such that portions of functions are implemented at different physical locations.

[0236] Computer-readable media includes both non-transitory computer storage media and communication media including any medium that facilitates transfer of a computer program from one place to another. A non-transitory storage medium may be any available medium that may be accessed by a general-purpose or special-purpose computer. By way of example, non-transitory computer-readable media may include RAM, ROM, electrically erasable programmable ROM (EEPROM), flash memory, compact disk (CD) ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other non-transitory medium that may be used to carry or store desired program code means in the form of instructions or data structures and that

may be accessed by a general-purpose or special-purpose computer, or a general-purpose or special-purpose processor.

[0237] As used herein, including in the claims, an article “a” before an element is unrestricted and understood to refer to “at least one” of those elements or “one or more” of those elements. The terms “a,” “at least one,” “one or more,” and “at least one of one or more” may be interchangeable. As used herein, including in the claims, “or” as used in a list of items (e.g., a list of items prefaced by a phrase such as “at least one of” or “one or more of” or “one or both of”) indicates an inclusive list such that, for example, a list of at least one of A, B, or C means A or B or C or AB or AC or BC or ABC (i.e., A and B and C). Also, as used herein, the phrase “based on” shall not be construed as a reference to a closed set of conditions. For example, an example step that is described as “based on condition A” may be based on both a condition A and a condition B without departing from the scope of the present disclosure. In other words, as used herein, the phrase “based on” shall be construed in the same manner as the phrase “based at least in part on. Further, as used herein, including in the claims, a “set” may include one or more elements.

[0238] The description herein is provided to enable a person having ordinary skill in the art to make or use the disclosure. Various modifications to the disclosure will be apparent to a person having ordinary skill in the art, and the generic principles defined herein may be applied to other variations without departing from the scope of the disclosure. Thus, the disclosure is not limited to the examples and designs described herein but is to be accorded the broadest scope consistent with the principles and novel features disclosed herein.

CLAIMS

What is claimed is:

1. A base station, comprising:
a processor; and
a transceiver coupled to the processor,
wherein the base station is a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), and the processor is configured to:
determine one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; and
transmit, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations,
wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.
2. The base station of claim 1, wherein the processor is further configured to:
transmit, via the transceiver and to the candidate target node, a first request message including a first source UE identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node.
3. The base station of claim 2, wherein the processor is further configured to:
transmit, via the transceiver and to the candidate target node, a first message including a first source UE identifier and one or more second LTM reference configurations associated with the first source UE identifier.
4. The base station of claim 2, wherein the first request message further includes one or more second LTM reference configurations associated with the first source UE identifier.

5. The base station of claim 4, wherein the first request message further includes a first indicator to indicate the candidate target node to store the one or more second LTM reference configurations.

6. The base station of claim 4, wherein the one or more second LTM reference configurations are included in a message embedded in the first request message.

7. The base station of claim 2, wherein the first reply message further includes a first selected LTM reference configuration or an index of the first selected LTM reference configuration in the case that the one or more second LTM reference configurations include multiple LTM reference configurations,

wherein the first selected LTM reference configuration is a LTM reference configuration selected from the one or more second LTM reference configurations by the candidate target node for the first LTM candidate cell configuration,

wherein the one or more first LTM reference configurations include the first selected LTM reference configuration.

8. The base station claim 2, wherein the processor is further configured to:

transmit, via the transceiver and to the candidate target node, a second request message including the first source UE identifier and a second cell identifier for requesting a second LTM candidate cell configuration for a second LTM candidate cell belonging to the candidate target node; and

receive, via the transceiver and from the candidate target node, a second reply messages including the second LTM candidate cell configuration determined based on the one or more second LTM reference configurations associated with the first source UE identifier,

wherein one or more first LTM candidate cell configurations include the second LTM candidate cell configuration.

9. The base station of any of claims 1 to 8, wherein the processor is further configured to:

transmit, via the transceiver and to the candidate target node, a third request message including a third source UE identifier and a third cell identifier for requesting a

third LTM candidate cell configuration for a third LTM candidate cell belonging to the candidate target node; and

receive, via the transceiver and from the candidate target node, a third reply message including the third LTM candidate cell configuration, wherein the third LTM candidate cell configuration is determined by the candidate target node based on an additional LTM reference configuration provided by the candidate target node, and the additional LTM reference configuration is associated to the third source UE identifier,

wherein the one or more first LTM candidate cell configurations include the third LTM candidate cell configuration.

10. The base station of claim 9, wherein the third reply message further includes the additional LTM reference configuration, wherein the one or more first LTM reference configurations include the additional LTM reference configuration.

11. The base station of claim 9, wherein the candidate target node is a candidate base station for LTM, and the first source UE identifier or the third source UE identifier is a source node UE Xn application protocol (XnAP) ID.

12. The base station of claim 9, wherein the base station includes a source central unit (CU) and one or more distributed units (DUs), the processor is a processor of the source CU, the candidate target node is a target DU among the one or more DU, and the first source UE identifier or the third source UE identifier is a CU UE F1 application protocol (F1AP) ID.

13. A network device, comprising:
a processor; and
a transceiver coupled to the processor,
wherein the network device is a first network device for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), and the processor is configured to:

receive, via the transceiver and from a second network device for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the first network device; and

transmit, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration,

wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

14. A user equipment (UE), comprising:

a processor; and

a transceiver coupled to the processor,

wherein the processor is configured to:

receive, via the transceiver and from a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, and

store the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations,

wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.

15 The UE of claim 14, wherein the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations are transmitted from the source base station to the UE via a reconfiguration message.

16. The UE of claim 15, wherein the reconfiguration message includes one or more configuration information elements (IEs), each configuration IE include one LTM reference configuration and at least one LTM candidate cell configuration associated with the one LTM reference configuration.

17. The UE of claim 15, wherein the reconfiguration message includes a reference configuration list in which each of the one or more LTM reference configurations is associated with at least one LTM candidate cell identifier (ID).

18. A method performed by a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), the method comprising:

determining one or more first LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more first LTM reference configurations; and

transmitting, via the transceiver and to a user equipment (UE), the one or more first LTM reference configurations and the one or more first LTM candidate cell configurations associated with the one or more first LTM reference configurations,

wherein the one or more first LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more first LTM reference configurations.

19. A method performed by a first network device for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), the method comprising:

receiving, via the transceiver and from a second network device for LTM, a first request message including a first source user equipment (UE) identifier and a first cell identifier for requesting a first LTM candidate cell configuration for a first LTM candidate cell belonging to the candidate target node; and

transmitting, via the transceiver and to the second network device, a first reply message including the first LTM candidate cell configuration,

wherein the first LTM candidate cell configuration is determined by the first network device based on a first LTM reference configuration.

20. A method performed by a user equipment (UE) for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), the method comprising:

receiving, via the transceiver and from a source base station for layer 1/layer 2 (L1/L2)-triggered mobility (LTM), one or more LTM reference configurations and one or more LTM candidate cell configurations associated with the one or more LTM reference configurations, and

storing the one or more LTM reference configurations and the one or more LTM candidate cell configurations associated with the one or more LTM reference configurations,

wherein the one or more LTM candidate cell configurations are provided by a candidate target node for LTM based on the one or more LTM reference configurations.