



US 20250267724A1

(19) **United States**

(12) **Patent Application Publication**
LY

(10) **Pub. No.: US 2025/0267724 A1**

(43) **Pub. Date: Aug. 21, 2025**

(54) **SYSTEM INFORMATION BLOCK**
COMMUNICATIONS

(52) **U.S. Cl.**
CPC ... **H04W 74/0836** (2024.01); **H04W 72/1273**
(2013.01); **H04W 72/21** (2023.01)

(71) Applicant: **QUALCOMM Incorporated**, San
Diego, CA (US)

(57) **ABSTRACT**

(72) Inventor: **Hung Dinh LY**, San Diego, CA (US)

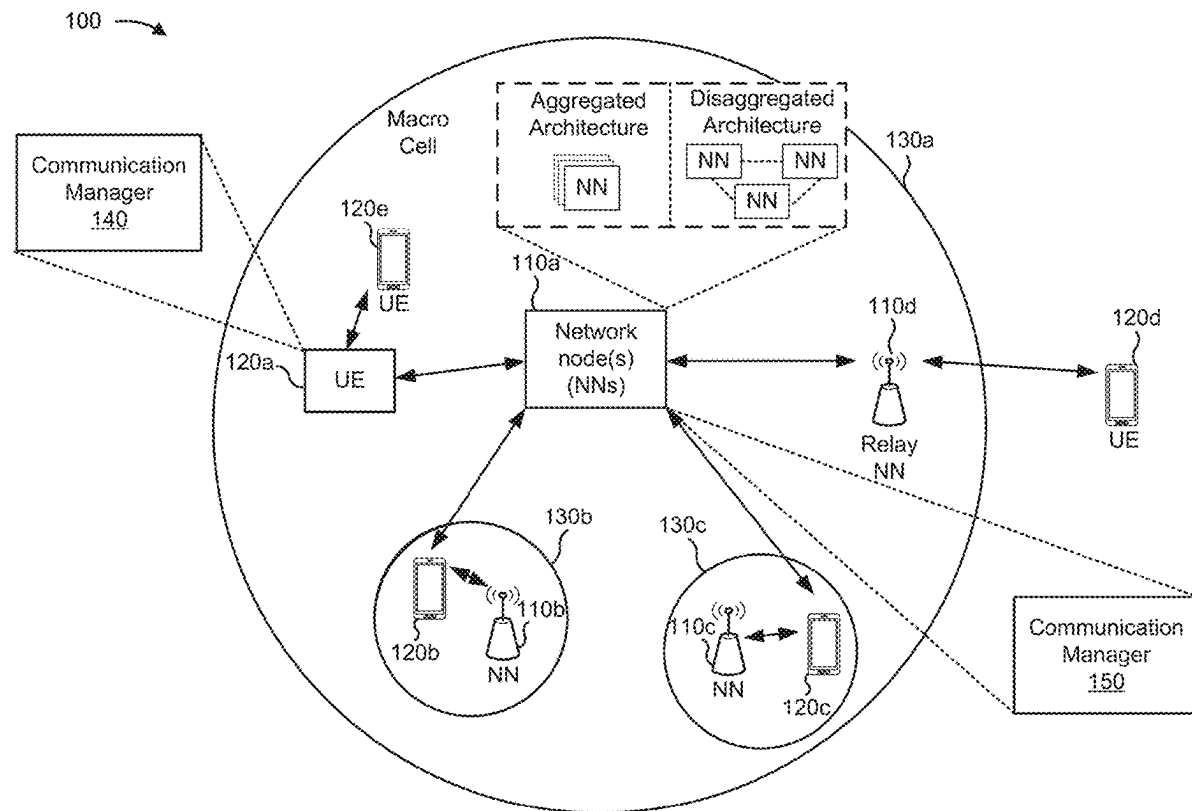
(21) Appl. No.: **18/442,799**

(22) Filed: **Feb. 15, 2024**

Publication Classification

(51) **Int. Cl.**
H04W 74/0836 (2024.01)
H04W 72/1273 (2023.01)
H04W 72/21 (2023.01)

Various aspects of the present disclosure generally relate to wireless communication. In some aspects, a user equipment (UE) may receive configuration information that includes one or more parameters for a system information block process. The UE may transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block. The UE may receive the system information block in accordance with the configuration information and the uplink signal. Numerous other aspects are described.



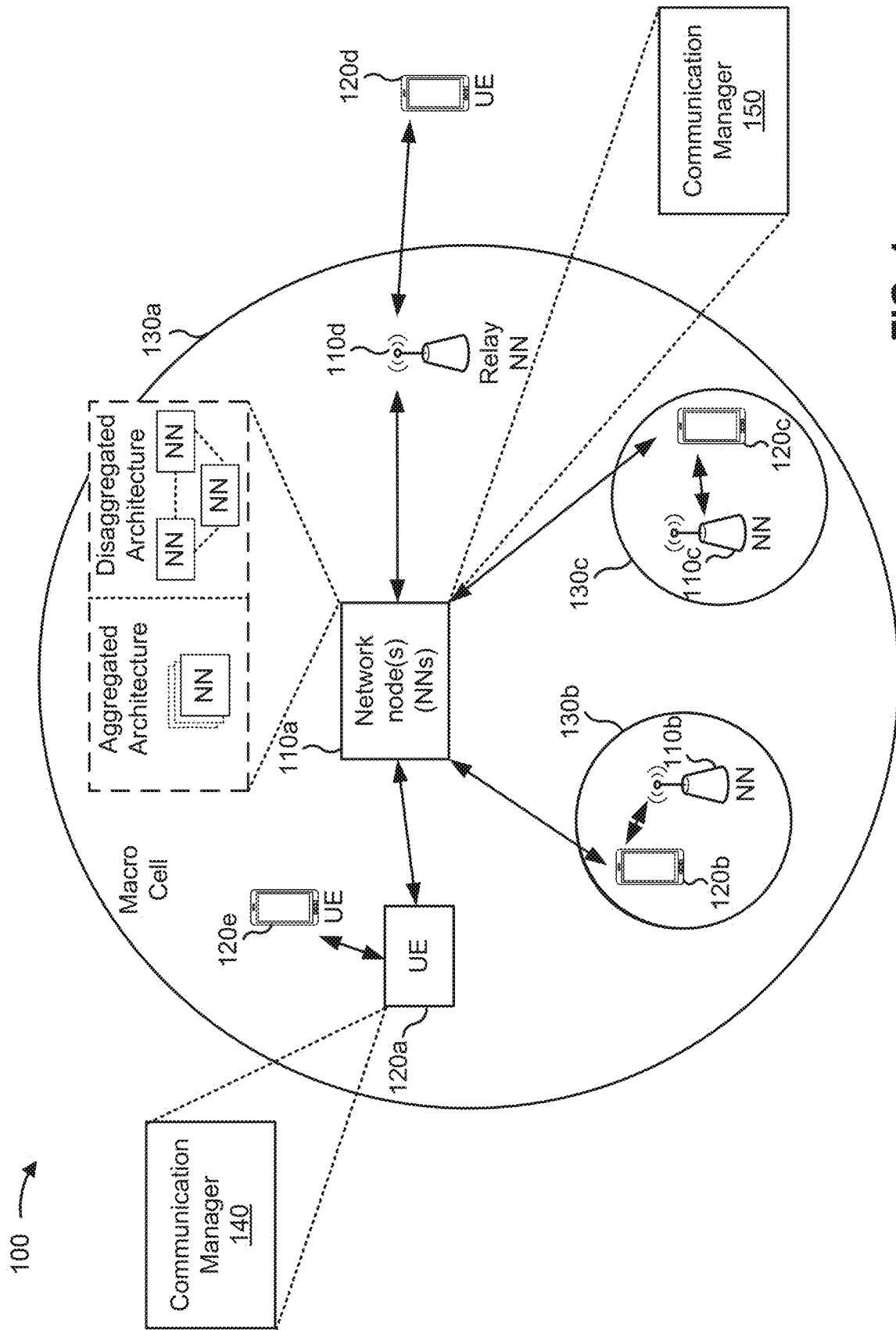


FIG. 1

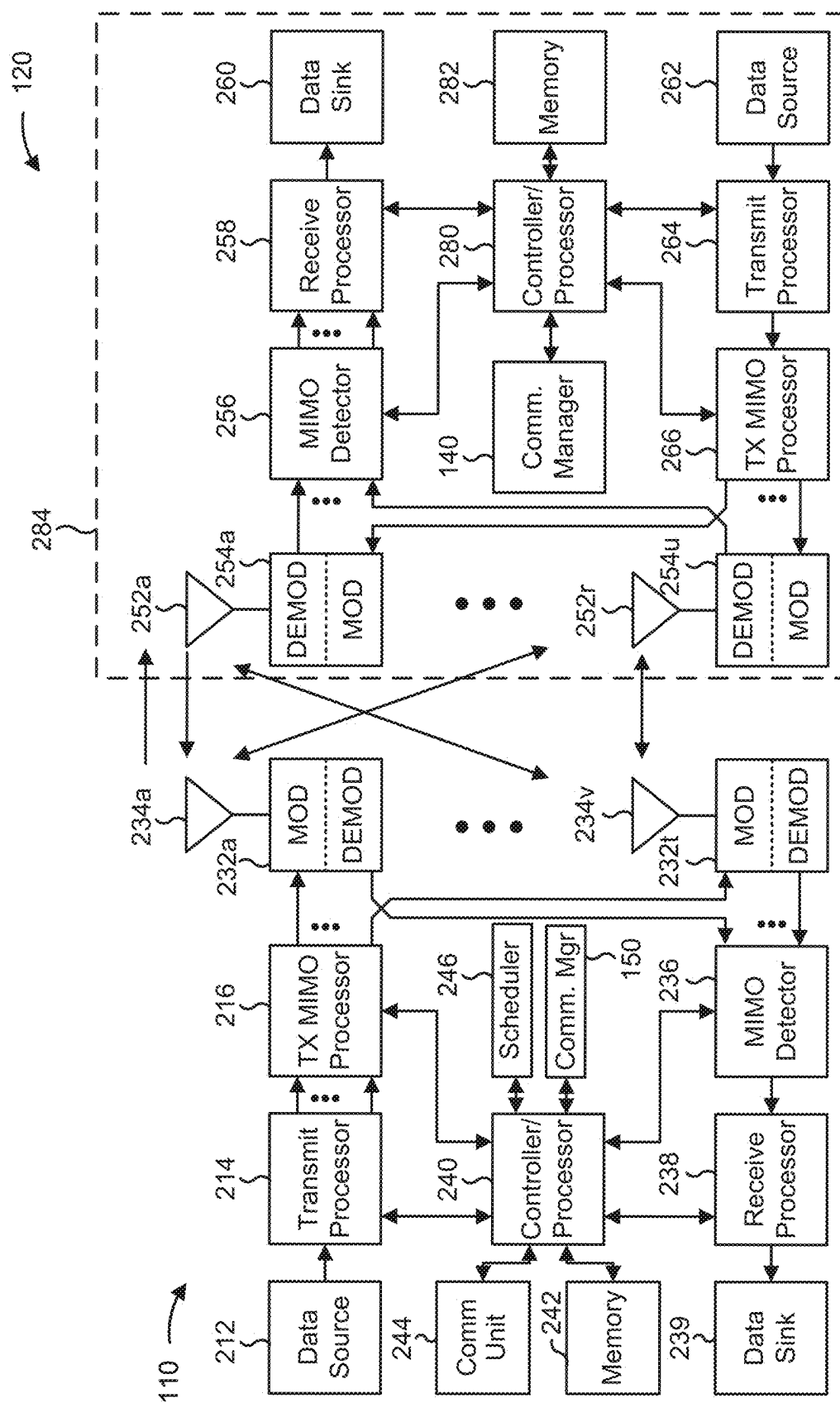


FIG. 2

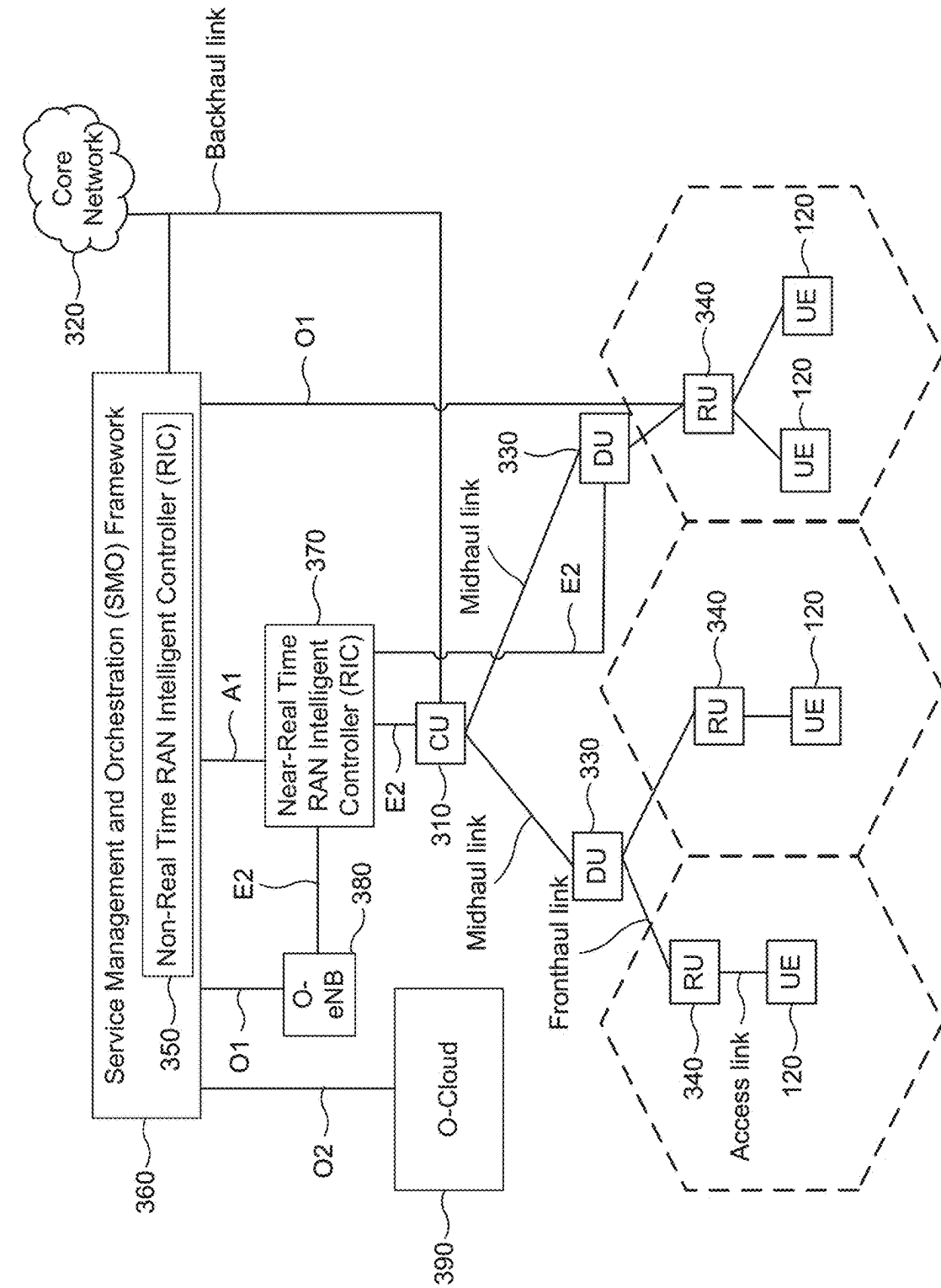


FIG. 3

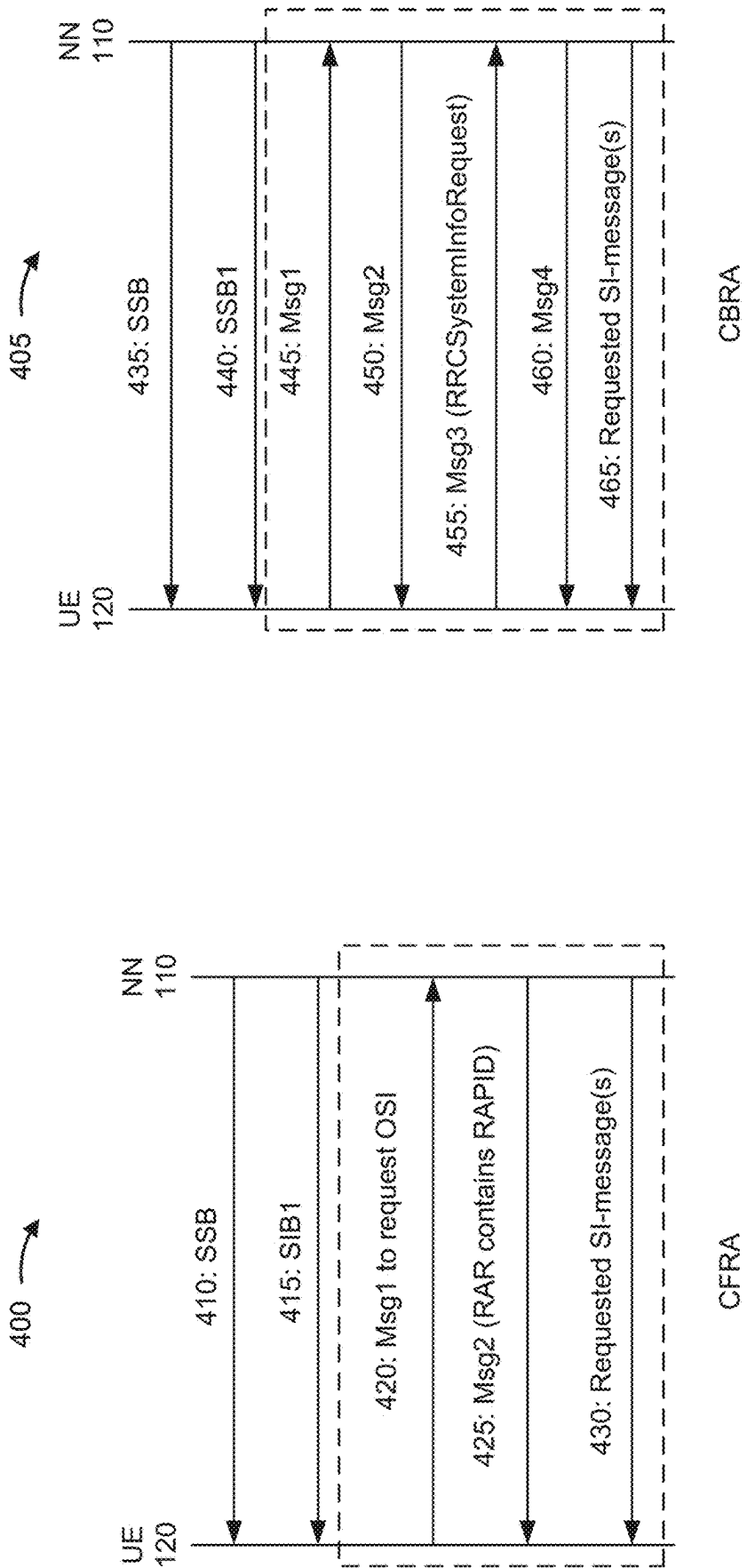


FIG. 4

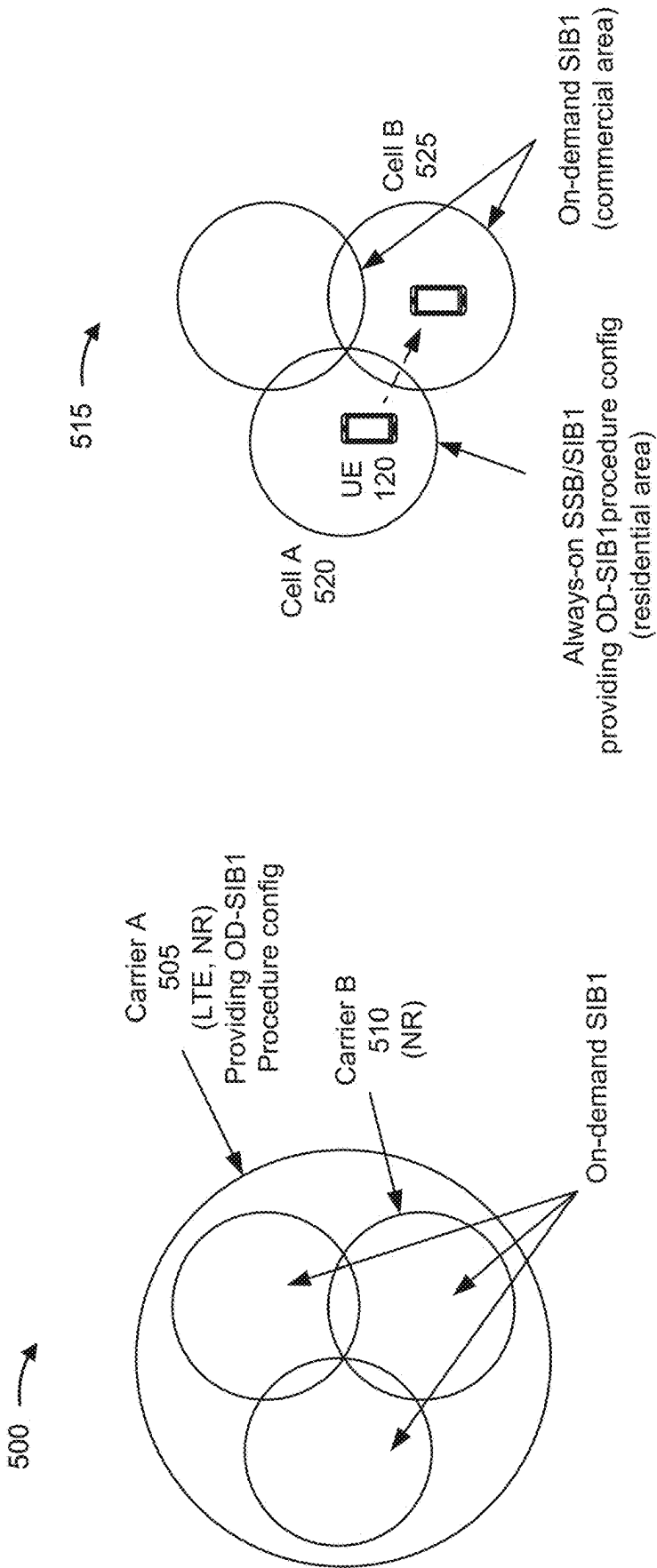


FIG. 5A

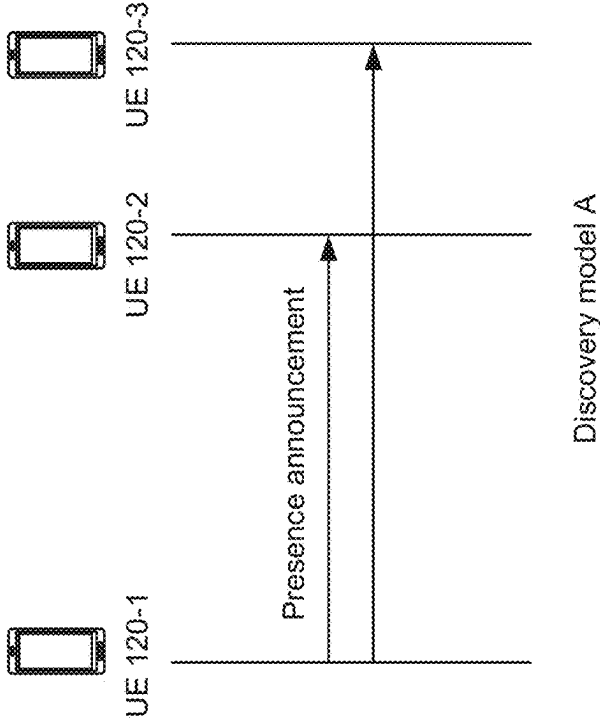
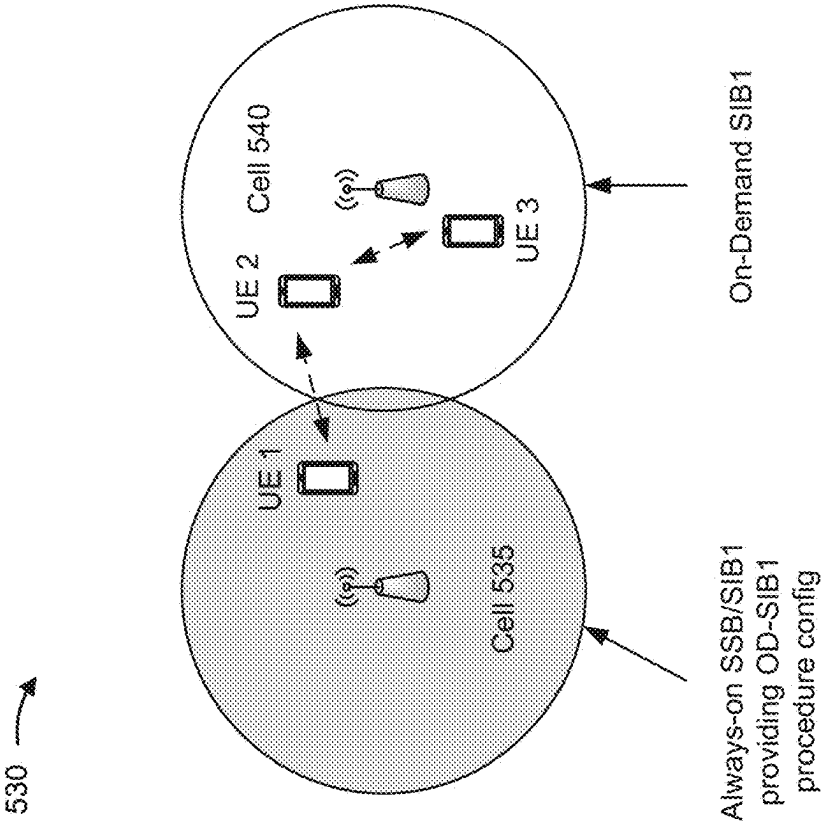


FIG. 5B

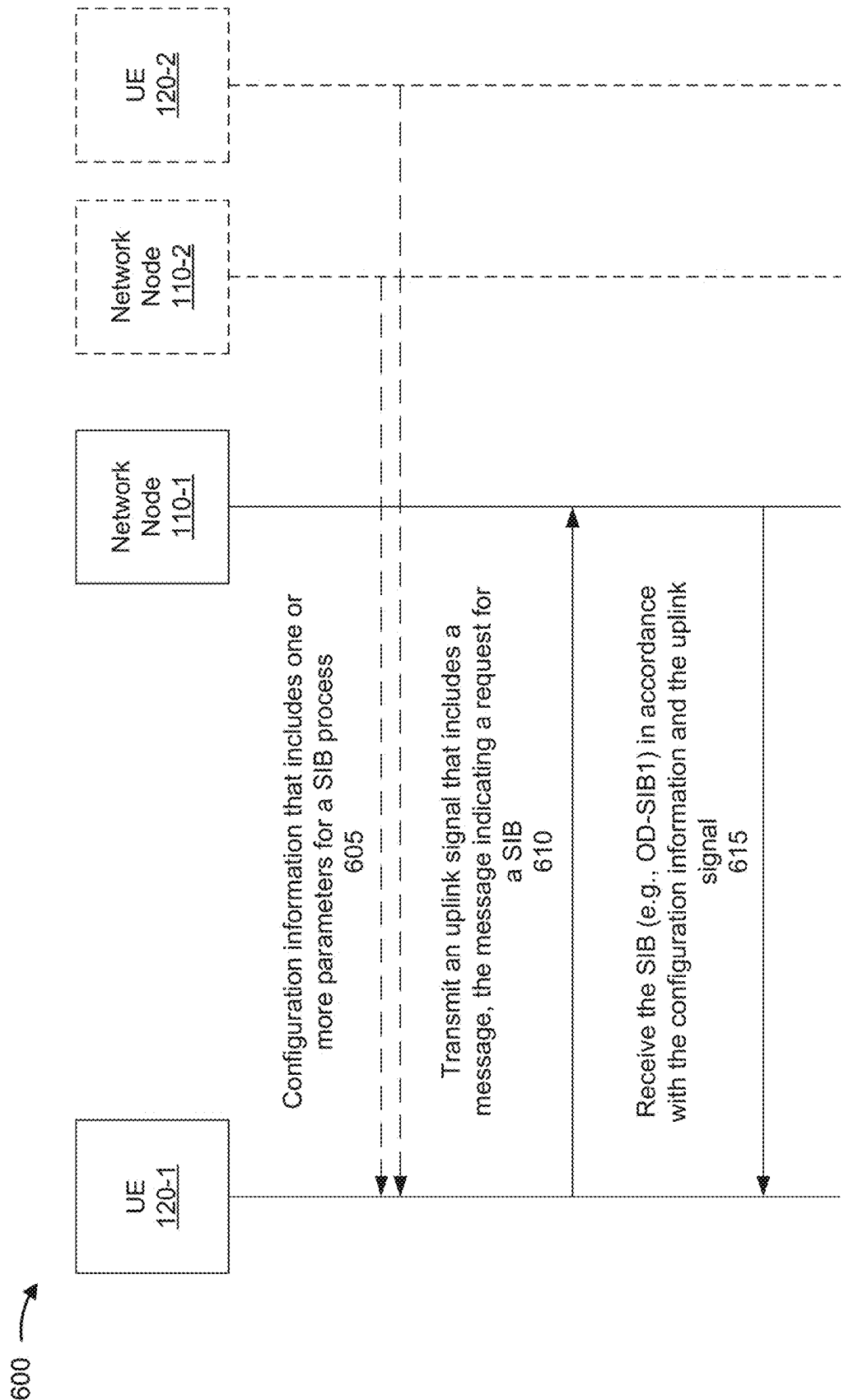


FIG. 6

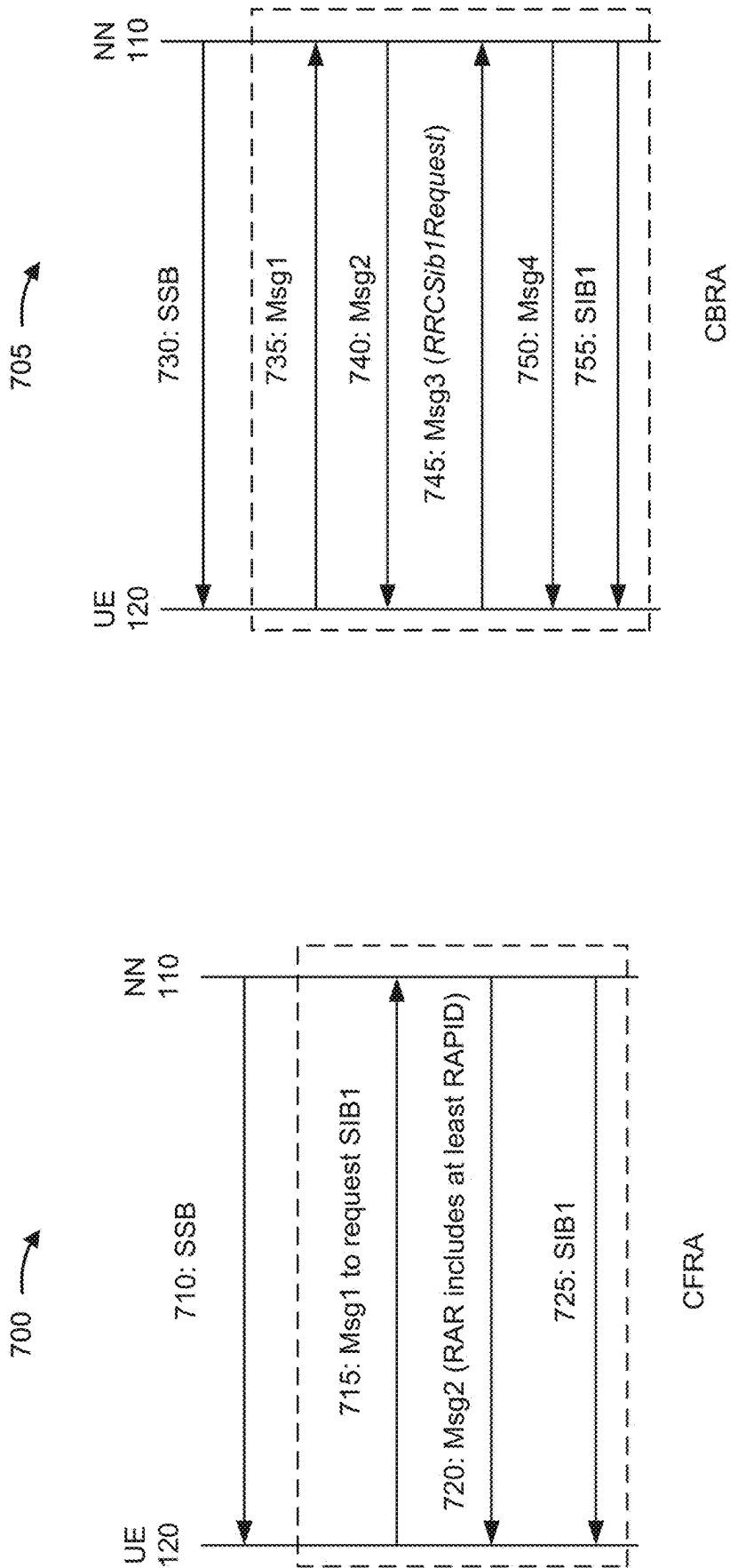


FIG. 7

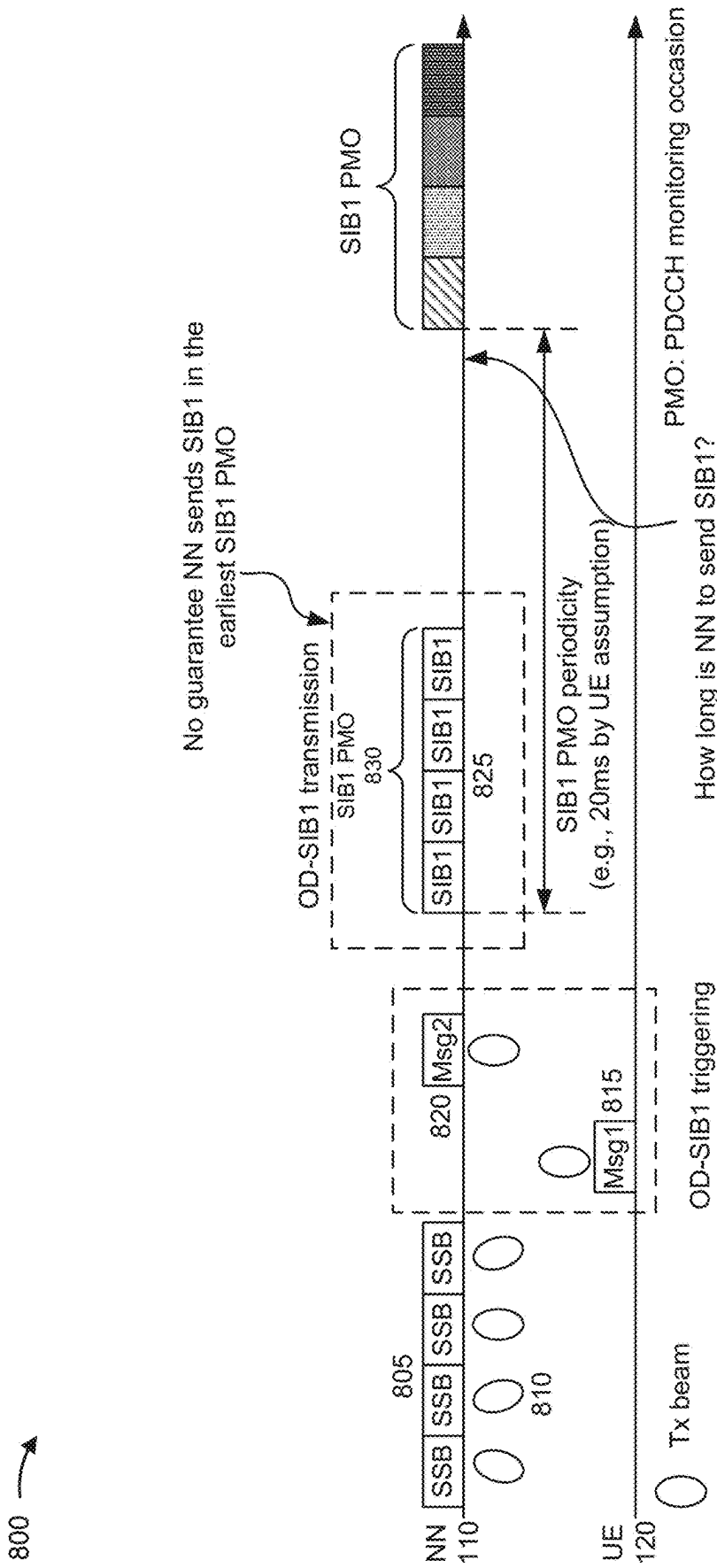
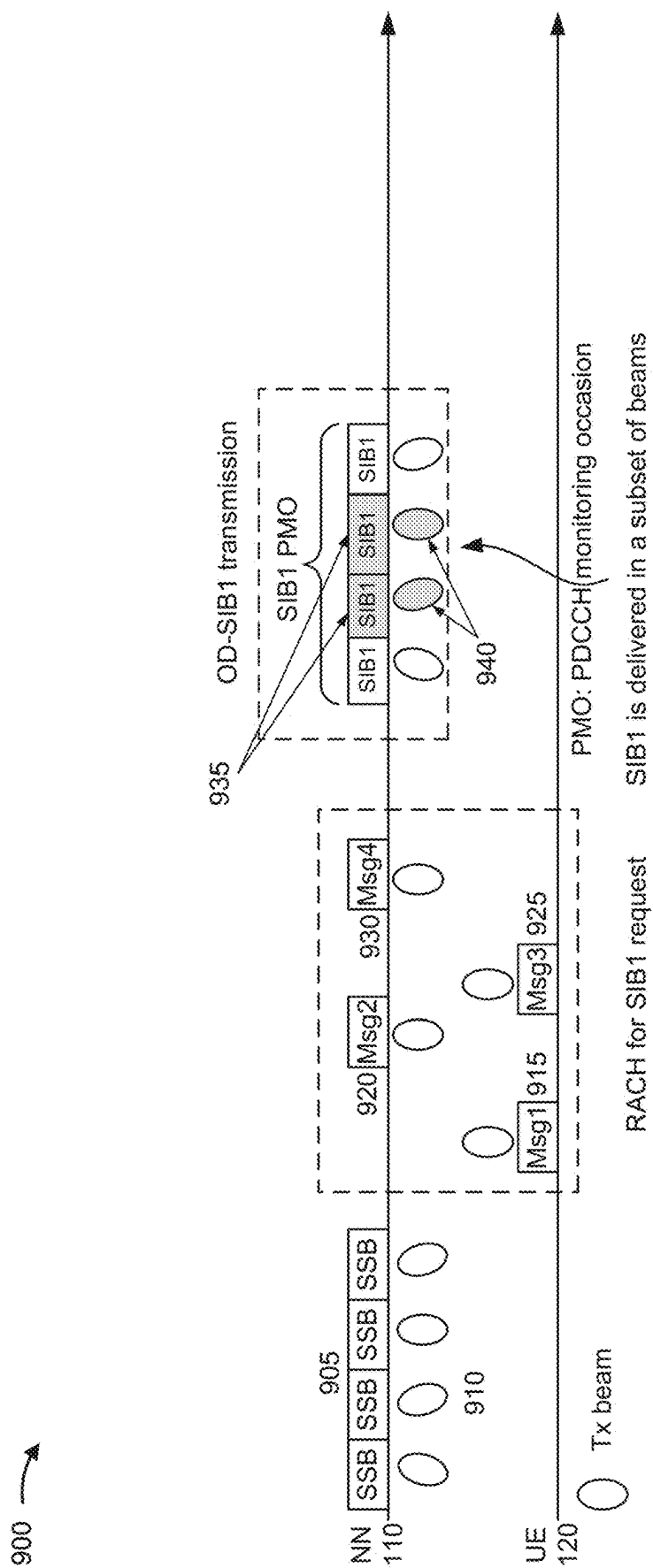


FIG. 8



9
6²
11

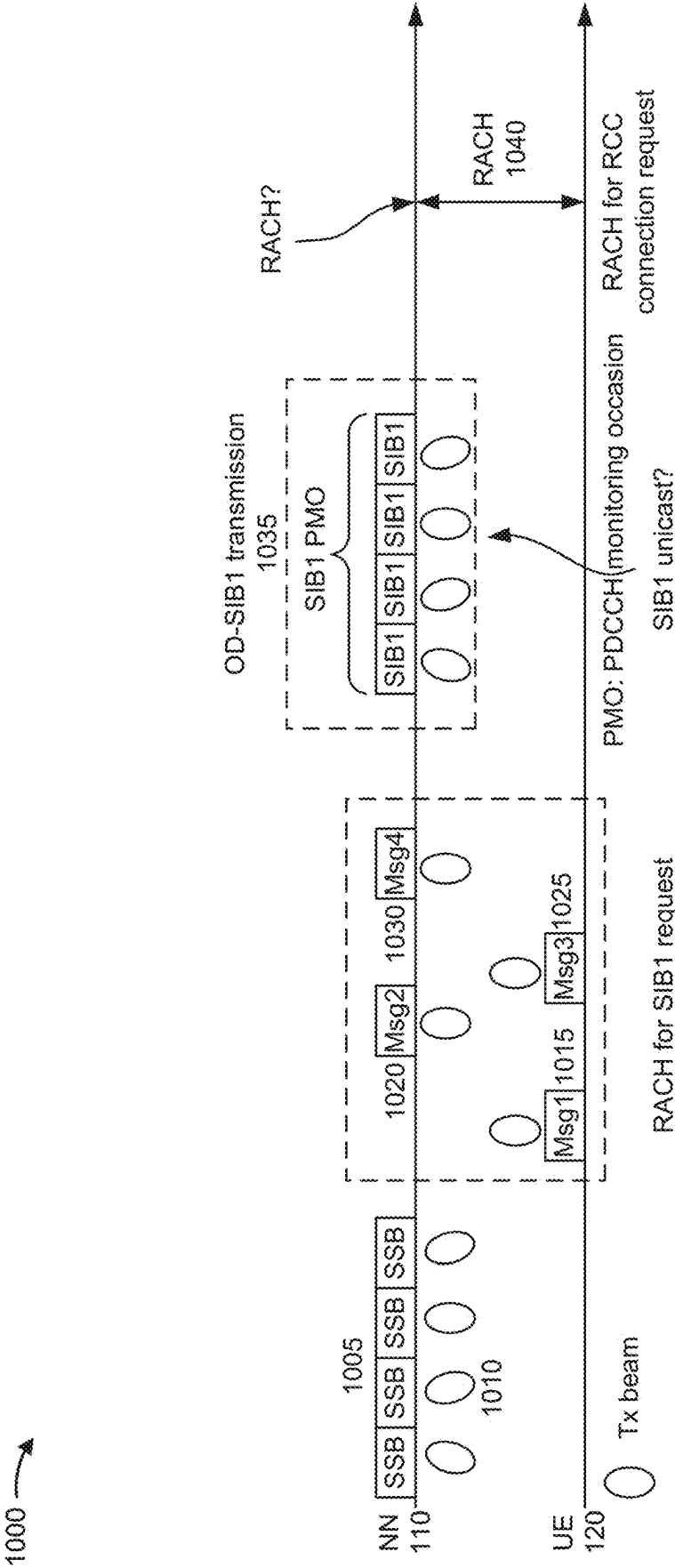


FIG. 10A

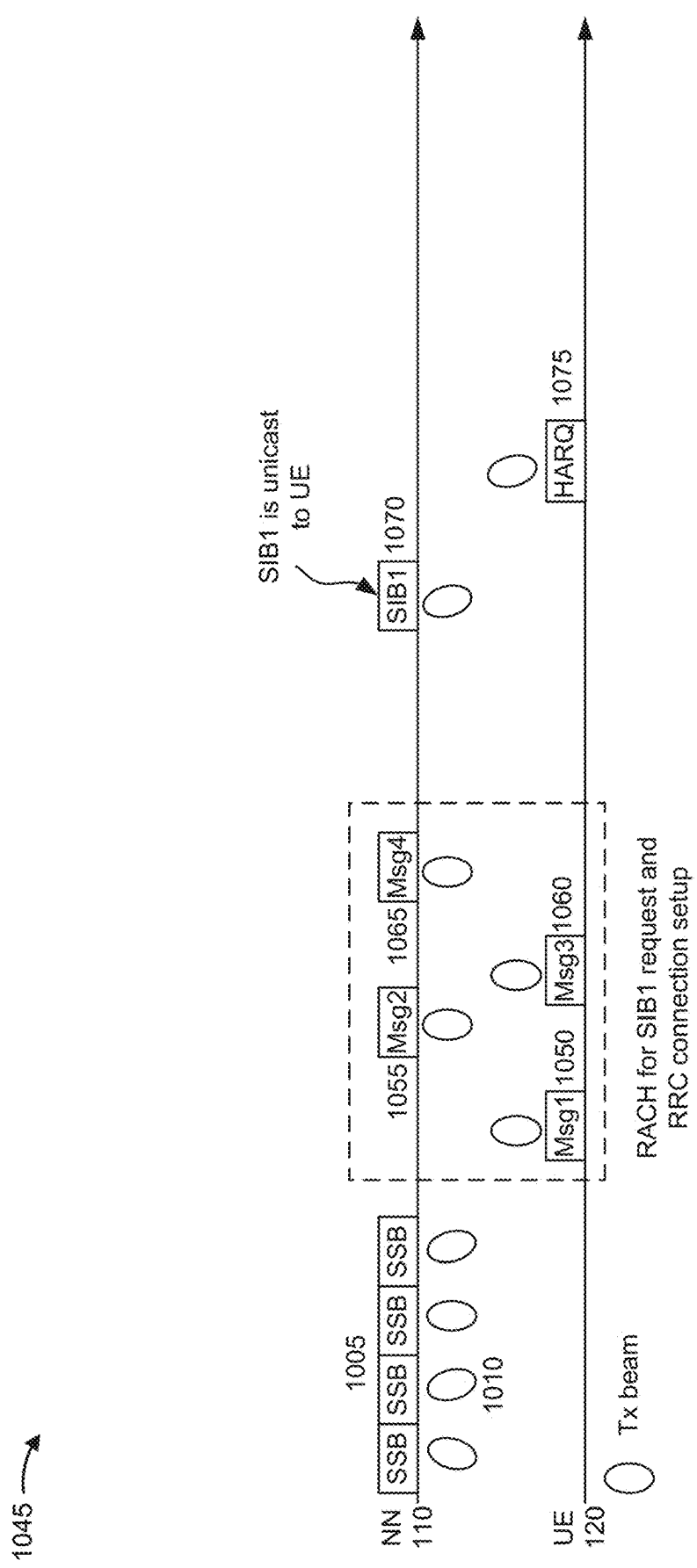


FIG. 10B

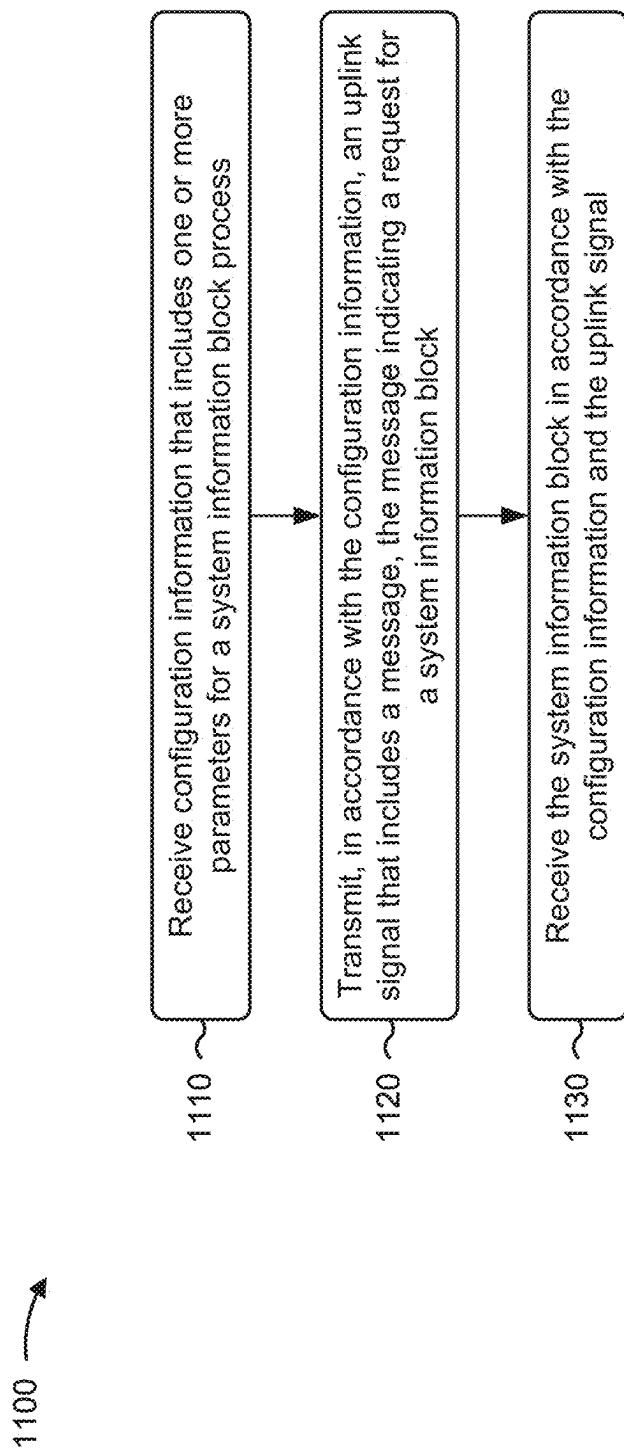


FIG. 11

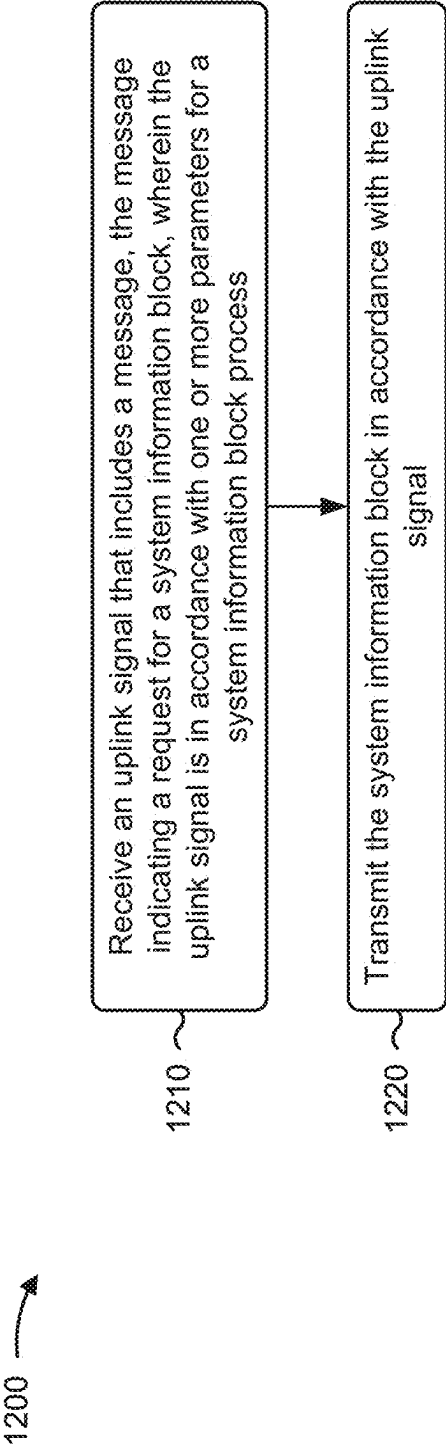


FIG. 12

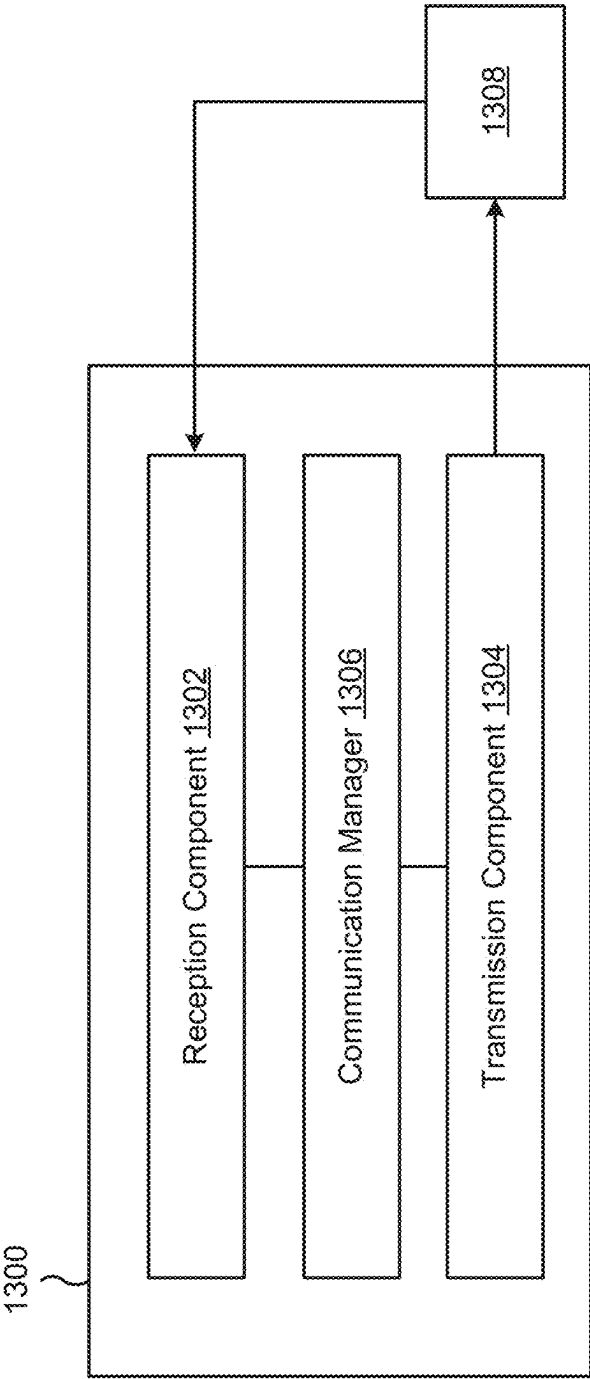


FIG. 13

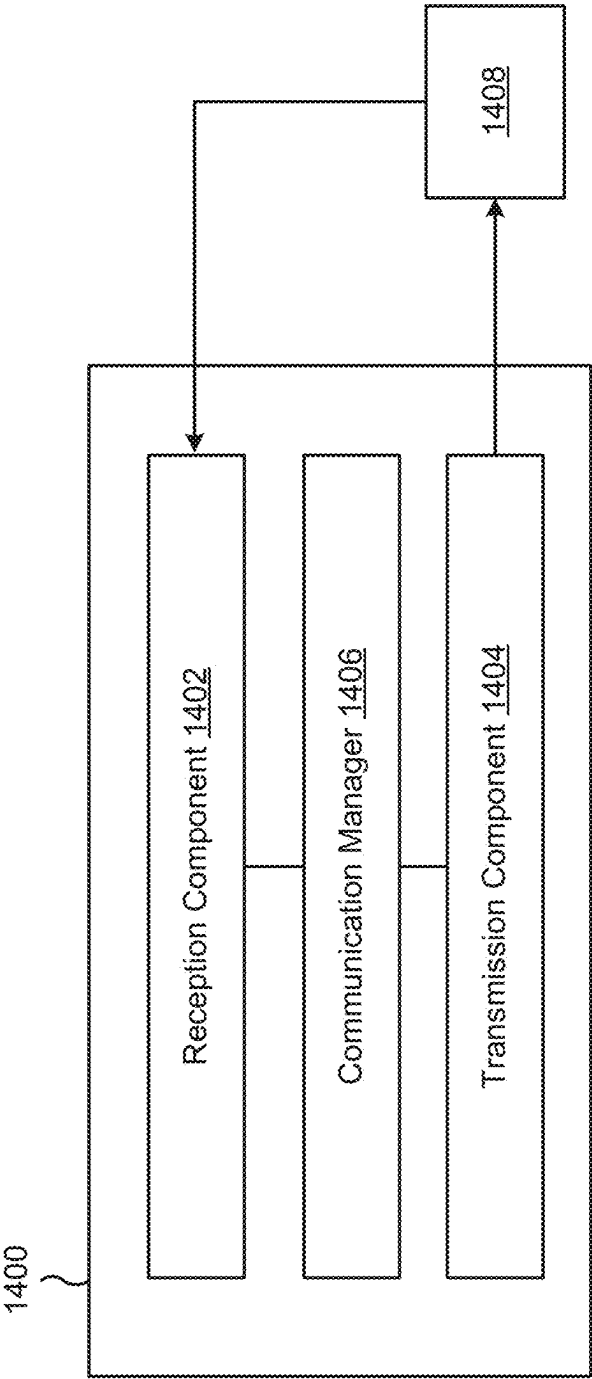


FIG. 14

SYSTEM INFORMATION BLOCK COMMUNICATIONS

FIELD OF THE DISCLOSURE

[0001] Aspects of the present disclosure generally relate to wireless communication and specifically relate to techniques, apparatuses, and methods for system information block communications.

BACKGROUND

[0002] Wireless communication systems are widely deployed to provide various services that may include carrying voice, text, messaging, video, data, and/or other traffic. The services may include unicast, multicast, and/or broadcast services, among other examples. Typical wireless communication systems may employ multiple-access radio access technologies (RATs) capable of supporting communication with multiple users by sharing available system resources (for example, time domain resources, frequency domain resources, spatial domain resources, and/or device transmit power, among other examples). Examples of such multiple-access RATs include code division multiple access (CDMA) systems, time division multiple access (TDMA) systems, frequency division multiple access (FDMA) systems, orthogonal frequency division multiple access (OFDMA) systems, single-carrier frequency division multiple access (SC-FDMA) systems, and time division synchronous code division multiple access (TD-SCDMA) systems.

[0003] The above multiple-access RATs have been adopted in various telecommunication standards to provide common protocols that enable different wireless communication devices to communicate on a municipal, national, regional, or global level. An example telecommunication standard is New Radio (NR). NR, which may also be referred to as 5G, is part of a continuous mobile broadband evolution promulgated by the Third Generation Partnership Project (3GPP). NR (and other mobile broadband evolutions beyond NR) may be designed to better support Internet of things (IoT) and reduced capability device deployments, industrial connectivity, millimeter wave (mmWave) expansion, licensed and unlicensed spectrum access, non-terrestrial network (NTN) deployment, sidelink and other device-to-device direct communication technologies (for example, cellular vehicle-to-everything (CV2X) communication), massive multiple-input multiple-output (MIMO), disaggregated network architectures and network topology expansions, multiple-subscriber implementations, high-precision positioning, and/or radio frequency (RF) sensing, among other examples. As the demand for mobile broadband access continues to increase, further improvements in NR may be implemented, and other radio access technologies such as 6G may be introduced, to further advance mobile broadband evolution.

SUMMARY

[0004] In some aspects, a method of wireless communication performed by a user equipment (UE) includes receiving configuration information that includes one or more parameters for a system information block process; transmitting, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and

receiving the system information block in accordance with the configuration information and the uplink signal.

[0005] In some aspects, a method of wireless communication performed by a network node includes receiving an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and transmitting the system information block in accordance with the uplink signal.

[0006] In some aspects, an apparatus for wireless communication at a UE includes one or more memories; and one or more processors, coupled to the one or more memories, which are configured, individually or in any combination, to cause the UE to: receive configuration information that includes one or more parameters for a system information block process; transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and receive the system information block in accordance with the configuration information and the uplink signal.

[0007] In some aspects, an apparatus for wireless communication at a network node includes one or more memories; and one or more processors, coupled to the one or more memories, which are configured, individually or in any combination, to cause the network node to: receive an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and transmit the system information block in accordance with the uplink signal.

[0008] In some aspects, a non-transitory computer-readable medium storing a set of instructions for wireless communication includes one or more instructions that, when executed by one or more processors of a UE, cause the UE to: receive configuration information that includes one or more parameters for a system information block process; transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and receive the system information block in accordance with the configuration information and the uplink signal.

[0009] In some aspects, a non-transitory computer-readable medium storing a set of instructions for wireless communication includes one or more instructions that, when executed by one or more processors of a network node, cause the network node to: receive an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and transmit the system information block in accordance with the uplink signal.

[0010] In some aspects, an apparatus for wireless communication includes means for receiving configuration information that includes one or more parameters for a system information block process; means for transmitting, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and means for receiving the system information block in accordance with the configuration information and the uplink signal.

[0011] In some aspects, an apparatus for wireless communication includes means for receiving an uplink signal that

includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and means for transmitting the system information block in accordance with the uplink signal.

[0012] Aspects of the present disclosure may generally be implemented by or as a method, apparatus, system, computer program product, non-transitory computer-readable medium, user equipment, base station, network node, network entity, wireless communication device, and/or processing system as substantially described with reference to, and as illustrated by, the specification and accompanying drawings.

[0013] The foregoing paragraphs of this section have broadly summarized some aspects of the present disclosure. These and additional aspects and associated advantages will be described hereinafter. The disclosed aspects may be used as a basis for modifying or designing other aspects for carrying out the same or similar purposes of the present disclosure. Such equivalent aspects do not depart from the scope of the appended claims. Characteristics of the aspects disclosed herein, both their organization and method of operation, together with associated advantages, will be better understood from the following description when considered in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The appended drawings illustrate some aspects of the present disclosure, but are not limiting of the scope of the present disclosure because the description may enable other aspects. Each of the drawings is provided for purposes of illustration and description, and not as a definition of the limits of the claims. The same or similar reference numbers in different drawings may identify the same or similar elements.

[0015] FIG. 1 is a diagram illustrating an example of a wireless communication network in accordance with the present disclosure.

[0016] FIG. 2 is a diagram illustrating an example network node in communication with an example user equipment (UE) in a wireless network in accordance with the present disclosure.

[0017] FIG. 3 is a diagram illustrating an example disaggregated base station architecture in accordance with the present disclosure.

[0018] FIG. 4 is a diagram illustrating an example of contention-free random-access and an example of contention-based random-access, in accordance with the present disclosure.

[0019] FIGS. 5A-5B are diagrams illustrating examples of system information block procedure configurations, in accordance with the present disclosure.

[0020] FIG. 6 is a diagram illustrating an example of system information block communications, in accordance with the present disclosure.

[0021] FIG. 7 is a diagram illustrating an example of a Message 1 based random-access process for on-demand system information block communication and an example of a Message 3 based random-access process for on-demand system information block communication, in accordance with the present disclosure.

[0022] FIG. 8 is a diagram illustrating an example of system information block transmission occasions, in accordance with the present disclosure.

[0023] FIG. 9 is a diagram illustrating an example of a Message 3 based random-access process for on-demand system information block communication, in accordance with the present disclosure.

[0024] FIGS. 10A-10B are diagrams illustrating example of a Message 3 based random-access processes for on-demand system information block communication, in accordance with the present disclosure.

[0025] FIG. 11 is a diagram illustrating an example process performed, for example, at a UE or an apparatus of a UE, in accordance with the present disclosure.

[0026] FIG. 12 is a diagram illustrating an example process performed, for example, at a network node or an apparatus of a network node, in accordance with the present disclosure.

[0027] FIG. 13 is a diagram of an example apparatus for wireless communication, in accordance with the present disclosure.

[0028] FIG. 14 is a diagram of an example apparatus for wireless communication, in accordance with the present disclosure.

DETAILED DESCRIPTION

[0029] Various aspects of the present disclosure are described hereinafter with reference to the accompanying drawings. However, aspects of the present disclosure may be embodied in many different forms and is not to be construed as limited to any specific aspect illustrated by or described with reference to an accompanying drawing or otherwise presented in this disclosure. Rather, these aspects are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. One skilled in the art may appreciate that the scope of the disclosure is intended to cover any aspect of the disclosure disclosed herein, whether implemented independently of or in combination with any other aspect of the disclosure. For example, an apparatus may be implemented or a method may be practiced using various combinations or quantities of the aspects set forth herein. In addition, the scope of the disclosure is intended to cover an apparatus having, or a method that is practiced using, other structures and/or functionalities in addition to or other than the structures and/or functionalities with which various aspects of the disclosure set forth herein may be practiced. Any aspect of the disclosure disclosed herein may be embodied by one or more elements of a claim.

[0030] Several aspects of telecommunication systems will now be presented with reference to various methods, operations, apparatuses, and techniques. These methods, operations, apparatuses, and techniques will be described in the following detailed description and illustrated in the accompanying drawings by various blocks, modules, components, circuits, steps, processes, or algorithms (collectively referred to as “elements”). These elements may be implemented using hardware, software, or a combination of hardware and software. Whether such elements are implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system.

[0031] A system information block (SIB) is a type of message used in cellular network to convey various types of system information to a user equipment (UE). A SIB may be

transmitted by a network node, for example, using a broadcast downlink channel, thereby allowing the UE to receive information about the network without needing to establish a dedicated connection. A SIB1 is a type of SIB that can be detected by a UE when the UE enters a coverage area of a cell. The SIB1 may act as an entry point for the UE to access system information and may include essential information required by the UE to access the cell and perform initial registration. In some cases, the SIB1 may include a public land mobile network (PLMN) identity list, cell access related information, cell selection and reselection information, scheduling information, and/or a system information (SI) value tag, among other examples. In some examples, after acquiring a master information block (MIB), which provides essential information about the physical configuration of the network, the UE may proceed to decode the SIB1 to understand the access and operational parameters of the cell. Following the SIB1, the UE can access other SIBs, for example, as directed by the scheduling information within the SIB1, thereby enabling the UE to configure itself for communication within the network. In some cases, the SIB may be an on-demand SIB (OD-SIB). For example, the SIB1 may be an on-demand SIB1 (OD-SIB1). An on-demand SIB may not be broadcast periodically like a regular SIB. Instead, the on-demand SIB may be available for the UE to request and receive on an as-needed basis. Traditional SIBs may be broadcast periodically, which may be a waste of network resources. On-demand SIBs may reduce unnecessary signaling and resource usage by only transmitting certain SIBs when explicitly requested by the UE. This may be beneficial when the SIB includes information that changes infrequently, is relevant only to a subset of UEs, or is too large or complex.

[0032] Various aspects relate generally to wireless communications. Some aspects more specifically relate to system information block communication. In some aspects, a UE may receive configuration information that includes one or more parameters for a SIB process. In some aspects, the UE may receive the configuration information from a network node (for example, a network node that transmits the SSB and the SIB). In some other aspects, the UE may receive the configuration information from another UE. The UE may transmit an uplink signal that includes a message, where the message indicates a request for a SIB. For example, the UE may transmit an uplink signal to a different network node than the network node that transmits the configuration information. The UE may receive the SIB in accordance with the configuration information and the uplink signal. The SIB may be an OD-SIB1. In one example, the SIB may be received in accordance with the SIB request that is transmitted via a Message 1 of a random-access procedure. In this example, the UE may receive a random access response via a Message 2 that includes at least a random access preamble identifier, and may receive the SIB in accordance with the configuration information, the uplink signal, and the random access response. In another example, the SIB may be received in accordance with a SIB request that is transmitted via a Message 3 of a random-access procedure. In this example, the UE may transmit a Message 3 that includes an RRC connection request, and may receive the SIB in accordance with the configuration information, the uplink signal, and the RRC connection request. In some aspects, the UE may receive timing information that indicates a time duration during which a network node is to

transmit the SIB. The timing information may be indicated in accordance with a quantity of SIB PDCCH monitoring occasions or in accordance with a time duration. In some aspects, the UE may transmit a message including both a SIB request and an RRC connection request. This message can be sent via the Message 1 or the Message 3 of the random access process.

[0033] Particular aspects of the subject matter described in this disclosure can be implemented to realize one or more of the following potential advantages. In some examples, by enabling communication of the configuration information and the uplink signal, the described techniques can be used to enable the UE to initiate SIB reception while the UE is in a non-active state. For example, the described techniques can be used to enable the UE to initiate OD-SIB1 reception while the UE is in an RRC idle state or an RRC inactive state. In some examples, by enabling communication of the SIB in accordance with (e.g., after a completion of) a Message 1 based random-access procedure, the described techniques can be used to enable the UE to receive the SIB after receiving a random access response. In some examples, by enabling communication of the SIB in accordance with (e.g., after a completion of) a Message 3 based random-access procedure, the described techniques can be used to enable the UE to monitor for the SIB after receiving a Message 4. These example advantages, among others, are described in more detail below.

[0034] Multiple-access radio access technologies (RATs) have been adopted in various telecommunication standards to provide common protocols that enable wireless communication devices to communicate on a municipal, enterprise, national, regional, or global level. For example, 5G New Radio (NR) is part of a continuous mobile broadband evolution promulgated by the Third Generation Partnership Project (3GPP). 5G NR supports various technologies and use cases including enhanced mobile broadband (eMBB), ultra-reliable low-latency communication (URLLC), massive machine-type communication (mMTC), millimeter wave (mmWave) technology, beamforming, network slicing, edge computing, Internet of Things (IoT) connectivity and management, and network function virtualization (NFV).

[0035] As the demand for broadband access increases and as technologies supported by wireless communication networks evolve, further technological improvements may be adopted in or implemented for 5G NR or future RATs, such as 6G, to further advance the evolution of wireless communication for a wide variety of existing and new use cases and applications. Such technological improvements may be associated with new frequency band expansion, licensed and unlicensed spectrum access, overlapping spectrum use, small cell deployments, non-terrestrial network (NTN) deployments, disaggregated network architectures and network topology expansion, device aggregation, advanced duplex communication, sidelink and other device-to-device direct communication, IoT (including passive or ambient IoT) networks, reduced capability (RedCap) UE functionality, industrial connectivity, multiple-subscriber implementations, high-precision positioning, radio frequency (RF) sensing, and/or artificial intelligence or machine learning (AI/ML), among other examples. These technological improvements may support use cases such as wireless backhauls, wireless data centers, extended reality (XR) and metaverse applications, meta services for supporting vehicle

connectivity, holographic and mixed reality communication, autonomous and collaborative robots, vehicle platooning and cooperative maneuvering, sensing networks, gesture monitoring, human-brain interfacing, digital twin applications, asset management, and universal coverage applications using non-terrestrial and/or aerial platforms, among other examples. The methods, operations, apparatuses, and techniques described herein may enable one or more of the foregoing technologies and/or support one or more of the foregoing use cases.

[0036] FIG. 1 is a diagram illustrating an example of a wireless communication network 100 in accordance with the present disclosure. The wireless communication network 100 may be or may include elements of a 5G (or NR) network or a 6G network, among other examples. The wireless communication network 100 may include multiple network nodes 110, shown as a network node (NN) 110a, a network node 110b, a network node 110c, and a network node 110d. The network nodes 110 may support communications with multiple UEs 120, shown as a UE 120a, a UE 120b, a UE 120c, a UE 120d, and a UE 120e.

[0037] The network nodes 110 and the UEs 120 of the wireless communication network 100 may communicate using the electromagnetic spectrum, which may be subdivided by frequency or wavelength into various classes, bands, carriers, and/or channels. For example, devices of the wireless communication network 100 may communicate using one or more operating bands. In some aspects, multiple wireless networks 100 may be deployed in a given geographic area. Each wireless communication network 100 may support a particular RAT (which may also be referred to as an air interface) and may operate on one or more carrier frequencies in one or more frequency ranges. Examples of RATs include a 4G RAT, a 5G/NR RAT, and/or a 6G RAT, among other examples. In some examples, when multiple RATs are deployed in a given geographic area, each RAT in the geographic area may operate on different frequencies to avoid interference with one another.

[0038] Various operating bands have been defined as frequency range designations FR1 (410 MHz through 7.125 GHz), FR2 (24.25 GHz through 52.6 GHz), FR3 (7.125 GHz through 24.25 GHz), FR4a or FR4-1 (52.6 GHz through 71 GHz), FR4 (52.6 GHz through 114.25 GHz), and FR5 (114.25 GHz through 300 GHz). Although a portion of FR1 is greater than 6 GHz, FR1 is often referred to (interchangeably) as a “Sub-6 GHz” band in some documents and articles. Similarly, FR2 is often referred to (interchangeably) as a “millimeter wave” band in some documents and articles, despite being different than the extremely high frequency (EHF) band (30 GHz through 300 GHz), which is identified by the International Telecommunications Union (ITU) as a “millimeter wave” band. The frequencies between FR1 and FR2 are often referred to as mid-band frequencies, which include FR3. Frequency bands falling within FR3 may inherit FR1 characteristics or FR2 characteristics, and thus may effectively extend features of FR1 or FR2 into mid-band frequencies. Thus, “sub-6 GHz,” if used herein, may broadly refer to frequencies that are less than 6 GHz, that are within FR1, and/or that are included in mid-band frequencies. Similarly, the term “millimeter wave,” if used herein, may broadly refer to frequencies that are included in mid-band frequencies, that are within FR2, FR4, FR4-a or FR4-1, or FR5, and/or that are within the EHF band. Higher frequency bands may extend 5G NR operation, 6G opera-

tion, and/or other RATs beyond 52.6 GHz. For example, each of FR4a, FR4-1, FR4, and FR5 falls within the EHF band. In some examples, the wireless communication network 100 may implement dynamic spectrum sharing (DSS), in which multiple RATs (for example, 4G/LTE and 5G/NR) are implemented with dynamic bandwidth allocation (for example, based on user demand) in a single frequency band. It is contemplated that the frequencies included in these operating bands (for example, FR1, FR2, FR3, FR4, FR4-a, FR4-1, and/or FR5) may be modified, and techniques described herein may be applicable to those modified frequency ranges.

[0039] A network node 110 may include one or more devices, components, or systems that enable communication between a UE 120 and one or more devices, components, or systems of the wireless communication network 100. A network node 110 may be, may include, or may also be referred to as an NR network node, a 5G network node, a 6G network node, a Node B, an eNB, a gNB, an access point (AP), a transmission reception point (TRP), a mobility element, a core, a network entity, a network element, a network equipment, and/or another type of device, component, or system included in a radio access network (RAN).

[0040] A network node 110 may be implemented as a single physical node (for example, a single physical structure) or may be implemented as two or more physical nodes (for example, two or more distinct physical structures). For example, a network node 110 may be a device or system that implements part of a radio protocol stack, a device or system that implements a full radio protocol stack (such as a full gNB protocol stack), or a collection of devices or systems that collectively implement the full radio protocol stack. For example, and as shown, a network node 110 may be an aggregated network node (having an aggregated architecture), meaning that the network node 110 may implement a full radio protocol stack that is physically and logically integrated within a single node (for example, a single physical structure) in the wireless communication network 100. For example, an aggregated network node 110 may consist of a single standalone base station or a single TRP that uses a full radio protocol stack to enable or facilitate communication between a UE 120 and a core network of the wireless communication network 100.

[0041] Alternatively, and as also shown, a network node 110 may be a disaggregated network node (sometimes referred to as a disaggregated base station), meaning that the network node 110 may implement a radio protocol stack that is physically distributed and/or logically distributed among two or more nodes in the same geographic location or in different geographic locations. For example, a disaggregated network node may have a disaggregated architecture. In some deployments, disaggregated network nodes 110 may be used in an integrated access and backhaul (IAB) network, in an open radio access network (O-RAN) (such as a network configuration in compliance with the O-RAN Alliance), or in a virtualized radio access network (vRAN), also known as a cloud radio access network (C-RAN), to facilitate scaling by separating base station functionality into multiple units that can be individually deployed.

[0042] The network nodes 110 of the wireless communication network 100 may include one or more central units (CUs), one or more distributed units (DUs), and/or one or more radio units (RUs). A CU may host one or more higher layer control functions, such as RRC functions, packet data

convergence protocol (PDCP) functions, and/or service data adaptation protocol (SDAP) functions, among other examples. A DU may host one or more of a radio link control (RLC) layer, a medium access control (MAC) layer, and/or one or more higher physical (PHY) layers depending, at least in part, on a functional split, such as a functional split defined by the 3GPP. In some examples, a DU also may host one or more lower PHY layer functions, such as a fast Fourier transform (FFT), an inverse FFT (iFFT), beamforming, physical random access channel (PRACH) extraction and filtering, and/or scheduling of resources for one or more UEs 120, among other examples. An RU may host RF processing functions or lower PHY layer functions, such as an FFT, an iFFT, beamforming, or PRACH extraction and filtering, among other examples, according to a functional split, such as a lower layer functional split. In such an architecture, each RU can be operated to handle over the air (OTA) communication with one or more UEs 120.

[0043] In some aspects, a single network node 110 may include a combination of one or more CUs, one or more DUs, and/or one or more RUs. Additionally or alternatively, a network node 110 may include one or more Near-Real Time (Near-RT) RAN Intelligent Controllers (RICs) and/or one or more Non-Real Time (Non-RT) RICs. In some examples, a CU, a DU, and/or an RU may be implemented as a virtual unit, such as a virtual central unit (VCU), a virtual distributed unit (VDU), or a virtual radio unit (VRU), among other examples. A virtual unit may be implemented as a virtual network function, such as associated with a cloud deployment.

[0044] Some network nodes 110 (for example, a base station, an RU, or a TRP) may provide communication coverage for a particular geographic area. In the 3GPP, the term “cell” can refer to a coverage area of a network node 110 or to a network node 110 itself, depending on the context in which the term is used. A network node 110 may support one or multiple (for example, three) cells. In some examples, a network node 110 may provide communication coverage for a macro cell, a pico cell, a femto cell, or another type of cell. A macro cell may cover a relatively large geographic area (for example, several kilometers in radius) and may allow unrestricted access by UEs 120 with service subscriptions. A pico cell may cover a relatively small geographic area and may allow unrestricted access by UEs 120 with service subscriptions. A femto cell may cover a relatively small geographic area (for example, a home) and may allow restricted access by UEs 120 having association with the femto cell (for example, UEs 120 in a closed subscriber group (CSG)). A network node 110 for a macro cell may be referred to as a macro network node. A network node 110 for a pico cell may be referred to as a pico network node. A network node 110 for a femto cell may be referred to as a femto network node or an in-home network node. In some examples, a cell may not necessarily be stationary. For example, the geographic area of the cell may move according to the location of an associated mobile network node 110 (for example, a train, a satellite base station, an unmanned aerial vehicle, or an NTN network node).

[0045] The wireless communication network 100 may be a heterogeneous network that includes network nodes 110 of different types, such as macro network nodes, pico network nodes, femto network nodes, relay network nodes, aggregated network nodes, and/or disaggregated network nodes, among other examples. In the example shown in FIG. 1, the

network node 110a may be a macro network node for a macro cell 130a, the network node 110b may be a pico network node for a pico cell 130b, and the network node 110c may be a femto network node for a femto cell 130c. Various different types of network nodes 110 may generally transmit at different power levels, serve different coverage areas, and/or have different impacts on interference in the wireless communication network 100 than other types of network nodes 110. For example, macro network nodes may have a high transmit power level (for example, 5 to 40 watts), whereas pico network nodes, femto network nodes, and relay network nodes may have lower transmit power levels (for example, 0.1 to 2 watts).

[0046] In some examples, a network node 110 may be, may include, or may operate as an RU, a TRP, or a base station that communicates with one or more UEs 120 via a radio access link (which may be referred to as a “Uu” link). The radio access link may include a downlink and an uplink. “Downlink” (or “DL”) refers to a communication direction from a network node 110 to a UE 120, and “uplink” (or “UL”) refers to a communication direction from a UE 120 to a network node 110. Downlink channels may include one or more control channels and one or more data channels. A downlink control channel may be used to transmit downlink control information (DCI) (for example, scheduling information, reference signals, and/or configuration information) from a network node 110 to a UE 120. A downlink data channel may be used to transmit downlink data (for example, user data associated with a UE 120) from a network node 110 to a UE 120. Downlink control channels may include one or more physical downlink control channels (PDCCHs), and downlink data channels may include one or more physical downlink shared channels (PDSCHs). Uplink channels may similarly include one or more control channels and one or more data channels. An uplink control channel may be used to transmit uplink control information (UCI) (for example, reference signals and/or feedback corresponding to one or more downlink transmissions) from a UE 120 to a network node 110. An uplink data channel may be used to transmit uplink data (for example, user data associated with a UE 120) from a UE 120 to a network node 110. Uplink control channels may include one or more physical uplink control channels (PUCCHs), and uplink data channels may include one or more physical uplink shared channels (PUSCHs). The downlink and the uplink may each include a set of resources on which the network node 110 and the UE 120 may communicate.

[0047] Downlink and uplink resources may include time domain resources (frames, subframes, slots, and/or symbols), frequency domain resources (frequency bands, component carriers, subcarriers, resource blocks, and/or resource elements), and/or spatial domain resources (particular transmit directions and/or beam parameters). Frequency domain resources of some bands may be subdivided into bandwidth parts (BWPs). A BWP may be a continuous block of frequency domain resources (for example, a continuous block of resource blocks) that are allocated for one or more UEs 120. A UE 120 may be configured with both an uplink BWP and a downlink BWP (where the uplink BWP and the downlink BWP may be the same BWP or different BWPs). A BWP may be dynamically configured (for example, by a network node 110 transmitting a DCI configuration to the one or more UEs 120) and/or reconfigured, which means that a BWP can be adjusted in real-time (or near-real-time)

based on changing network conditions in the wireless communication network **100** and/or based on the specific requirements of the one or more UEs **120**. This enables more efficient use of the available frequency domain resources in the wireless communication network **100** because fewer frequency domain resources may be allocated to a BWP for a UE **120** (which may reduce the quantity of frequency domain resources that a UE **120** is required to monitor), leaving more frequency domain resources to be spread across multiple UEs **120**. Thus, BWPs may also assist in the implementation of lower-capability UEs **120** by facilitating the configuration of smaller bandwidths for communication by such UEs **120**.

[0048] As described above, in some aspects, the wireless communication network **100** may be, may include, or may be included in, an IAB network. In an IAB network, at least one network node **110** is an anchor network node that communicates with a core network. An anchor network node **110** may also be referred to as an IAB donor (or “IAB-donor”). The anchor network node **110** may connect to the core network via a wired backhaul link. For example, an Ng interface of the anchor network node **110** may terminate at the core network. Additionally or alternatively, an anchor network node **110** may connect to one or more devices of the core network that provide a core access and mobility management function (AMF). An IAB network also generally includes multiple non-anchor network nodes **110**, which may also be referred to as relay network nodes or simply as IAB nodes (or “IAB-nodes”). Each non-anchor network node **110** may communicate directly with the anchor network node **110** via a wireless backhaul link to access the core network, or may communicate indirectly with the anchor network node **110** via one or more other non-anchor network nodes **110** and associated wireless backhaul links that form a backhaul path to the core network. Some anchor network node **110** or other non-anchor network node **110** may also communicate directly with one or more UEs **120** via wireless access links that carry access traffic. In some examples, network resources for wireless communication (such as time resources, frequency resources, and/or spatial resources) may be shared between access links and backhaul links.

[0049] In some examples, any network node **110** that relays communications may be referred to as a relay network node, a relay station, or simply as a relay. A relay may receive a transmission of a communication from an upstream station (for example, another network node **110** or a UE **120**) and transmit the communication to a downstream station (for example, a UE **120** or another network node **110**). In this case, the wireless communication network **100** may include or be referred to as a “multi-hop network.” In the example shown in FIG. 1, the network node **110d** (for example, a relay network node) may communicate with the network node **110a** (for example, a macro network node) and the UE **120d** in order to facilitate communication between the network node **110a** and the UE **120d**. Additionally or alternatively, a UE **120** may be or may operate as a relay station that can relay transmissions to or from other UEs **120**. A UE **120** that relays communications may be referred to as a UE relay or a relay UE, among other examples.

[0050] The UEs **120** may be physically dispersed throughout the wireless communication network **100**, and each UE **120** may be stationary or mobile. A UE **120** may be, may

include, or may be included in an access terminal, another terminal, a mobile station, or a subscriber unit. A UE **120** may be, include, or be coupled with a cellular phone (for example, a smart phone), a personal digital assistant (PDA), a wireless modem, a wireless communication device, a handheld device, a laptop computer, a cordless phone, a wireless local loop (WLL) station, a tablet, a camera, a gaming device, a netbook, a smartbook, an ultrabook, a medical device, a biometric device, a wearable device (for example, a smart watch, smart clothing, smart glasses, a smart wristband, and/or smart jewelry, such as a smart ring or a smart bracelet), an entertainment device (for example, a music device, a video device, and/or a satellite radio), an XR device, a vehicular component or sensor, a smart meter or sensor, industrial manufacturing equipment, a Global Navigation Satellite System (GNSS) device (such as a Global Positioning System device or another type of positioning device), a UE function of a network node, and/or any other suitable device or function that may communicate via a wireless medium.

[0051] A UE **120** and/or a network node **110** may include one or more chips, system-on-chips (SoCs), chipsets, packages, or devices that individually or collectively constitute or comprise a processing system. The processing system includes processor (or “processing”) circuitry in the form of one or multiple processors, microprocessors, processing units (such as central processing units (CPUs), graphics processing units (GPUs), neural processing units (NPU) and/or digital signal processors (DSPs)), processing blocks, application-specific integrated circuits (ASIC), programmable logic devices (PLDs) (such as field programmable gate arrays (FPGAs)), or other discrete gate or transistor logic or circuitry (all of which may be generally referred to herein individually as “processors” or collectively as “the processor” or “the processor circuitry”). One or more of the processors may be individually or collectively configurable or configured to perform various functions or operations described herein. A group of processors collectively configurable or configured to perform a set of functions may include a first processor configurable or configured to perform a first function of the set and a second processor configurable or configured to perform a second function of the set, or may include the group of processors all being configured or configurable to perform the set of functions.

[0052] The processing system may further include memory circuitry in the form of one or more memory devices, memory blocks, memory elements or other discrete gate or transistor logic or circuitry, each of which may include tangible storage media such as random-access memory (RAM) or read-only memory (ROM), or combinations thereof (all of which may be generally referred to herein individually as “memories” or collectively as “the memory” or “the memory circuitry”). One or more of the memories may be coupled (for example, operatively coupled, communicatively coupled, electronically coupled, or electrically coupled) with one or more of the processors and may individually or collectively store processor-executable code (such as software) that, when executed by one or more of the processors, may configure one or more of the processors to perform various functions or operations described herein. Additionally or alternatively, in some examples, one or more of the processors may be preconfigured to perform various functions or operations described herein without requiring configuration by software. The

processing system may further include or be coupled with one or more modems (such as a Wi-Fi (for example, IEEE compliant) modem or a cellular (for example, 3GPP 4G LTE, 5G, or 6G compliant) modem). In some implementations, one or more processors of the processing system include or implement one or more of the modems. The processing system may further include or be coupled with multiple radios (collectively “the radio”), multiple RF chains, or multiple transceivers, each of which may in turn be coupled with one or more of multiple antennas. In some implementations, one or more processors of the processing system include or implement one or more of the radios, RF chains or transceivers. The UE 120 may include or may be included in a housing that houses components associated with the UE 120 including the processing system.

[0053] Some UEs 120 may be considered machine-type communication (MTC) UEs, evolved or enhanced machine-type communication (eMTC), UEs, further enhanced eMTC (feMTC) UEs, or enhanced feMTC (efeMTC) UEs, or further evolutions thereof, all of which may be simply referred to as “MTC UEs”. An MTC UE may be, may include, or may be included in or coupled with a robot, an uncrewed aerial vehicle, a remote device, a sensor, a meter, a monitor, and/or a location tag. Some UEs 120 may be considered IoT devices and/or may be implemented as NB-IoT (narrowband IoT) devices. An IoT UE or NB-IoT device may be, may include, or may be included in or coupled with an industrial machine, an appliance, a refrigerator, a doorbell camera device, a home automation device, and/or a light fixture, among other examples. Some UEs 120 may be considered Customer Premises Equipment, which may include telecommunications devices that are installed at a customer location (such as a home or office) to enable access to a service provider’s network (such as included in or in communication with the wireless communication network 100).

[0054] Some UEs 120 may be classified according to different categories in association with different complexities and/or different capabilities. UEs 120 in a first category may facilitate massive IoT in the wireless communication network 100, and may offer low complexity and/or cost relative to UEs 120 in a second category. UEs 120 in a second category may include mission-critical IoT devices, legacy UEs, baseline UEs, high-tier UEs, advanced UEs, full-capability UEs, and/or premium UEs that are capable of URLLC, enhanced mobile broadband (eMBB), and/or precise positioning in the wireless communication network 100, among other examples. A third category of UEs 120 may have mid-tier complexity and/or capability (for example, a capability between UEs 120 of the first category and UEs 120 of the second capability). A UE 120 of the third category may be referred to as a reduced capacity UE (“RedCap UE”), a mid-tier UE, an NR-Light UE, and/or an NR-Lite UE, among other examples. RedCap UEs may bridge a gap between the capability and complexity of NB-IoT devices and/or eMTC UEs, and mission-critical IoT devices and/or premium UEs. RedCap UEs may include, for example, wearable devices, IoT devices, industrial sensors, and/or cameras that are associated with a limited bandwidth, power capacity, and/or transmission range, among other examples. RedCap UEs may support healthcare environments, building automation, electrical distribution, process automation, transport and logistics, and/or smart city deployments, among other examples.

[0055] In some examples, two or more UEs 120 (for example, shown as UE 120a and UE 120e) may communicate directly with one another using sidelink communications (for example, without communicating by way of a network node 110 as an intermediary). As an example, the UE 120a may directly transmit data, control information, or other signaling as a sidelink communication to the UE 120e. This is in contrast to, for example, the UE 120a first transmitting data in an UL communication to a network node 110, which then transmits the data to the UE 120e in a DL communication. In various examples, the UEs 120 may transmit and receive sidelink communications using peer-to-peer (P2P) communication protocols, device-to-device (D2D) communication protocols, vehicle-to-everything (V2X) communication protocols (which may include vehicle-to-vehicle (V2V) protocols, vehicle-to-infrastructure (V2I) protocols, and/or vehicle-to-pedestrian (V2P) protocols), and/or mesh network communication protocols. In some deployments and configurations, a network node 110 may schedule and/or allocate resources for sidelink communications between UEs 120 in the wireless communication network 100. In some other deployments and configurations, a UE 120 (instead of a network node 110) may perform, or collaborate or negotiate with one or more other UEs to perform, scheduling operations, resource selection operations, and/or other operations for sidelink communications.

[0056] In various examples, some of the network nodes 110 and the UEs 120 of the wireless communication network 100 may be configured for full-duplex operation in addition to half-duplex operation. A network node 110 or a UE 120 operating in a half-duplex mode may perform only one of transmission or reception during particular time resources, such as during particular slots, symbols, or other time periods. Half-duplex operation may involve time-division duplexing (TDD), in which DL transmissions of the network node 110 and UL transmissions of the UE 120 do not occur in the same time resources (that is, the transmissions do not overlap in time). In contrast, a network node 110 or a UE 120 operating in a full-duplex mode can transmit and receive communications concurrently (for example, in the same time resources). By operating in a full-duplex mode, network nodes 110 and/or UEs 120 may generally increase the capacity of the network and the radio access link. In some examples, full-duplex operation may involve frequency-division duplexing (FDD), in which DL transmissions of the network node 110 are performed in a first frequency band or on a first component carrier and transmissions of the UE 120 are performed in a second frequency band or on a second component carrier different than the first frequency band or the first component carrier, respectively. In some examples, full-duplex operation may be enabled for a UE 120 but not for a network node 110. For example, a UE 120 may simultaneously transmit an UL transmission to a first network node 110 and receive a DL transmission from a second network node 110 in the same time resources. In some other examples, full-duplex operation may be enabled for a network node 110 but not for a UE 120. For example, a network node 110 may simultaneously transmit a DL transmission to a first UE 120 and receive an UL transmission from a second UE 120 in the same time resources. In some other examples, full-duplex operation may be enabled for both a network node 110 and a UE 120.

[0057] In some examples, the UEs 120 and the network nodes 110 may perform MIMO communication. “MIMO” generally refers to transmitting or receiving multiple signals (such as multiple layers or multiple data streams) simultaneously over the same time and frequency resources. MIMO techniques generally exploit multipath propagation. MIMO may be implemented using various spatial processing or spatial multiplexing operations. In some examples, MIMO may support simultaneous transmission to multiple receivers, referred to as multi-user MIMO (MU-MIMO). Some RATs may employ advanced MIMO techniques, such as mTRP operation (including redundant transmission or reception on multiple TRPs), reciprocity in the time domain or the frequency domain, single-frequency-network (SFN) transmission, or non-coherent joint transmission (NC-JT).

[0058] In some aspects, the UE 120 may include a communication manager 140. As described in more detail elsewhere herein, the communication manager 140 may receive configuration information that includes one or more parameters for a system information block process; transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and receive the system information block in accordance with the configuration information and the uplink signal. Additionally, or alternatively, the communication manager 140 may perform one or more other operations described herein.

[0059] In some aspects, the network node 110 may include a communication manager 150. As described in more detail elsewhere herein, the communication manager 150 may receive an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and transmit the system information block in accordance with the uplink signal. Additionally, or alternatively, the communication manager 150 may perform one or more other operations described herein.

[0060] As indicated above, FIG. 1 is provided as an example. Other examples may differ from what is described with regard to FIG. 1.

[0061] FIG. 2 is a diagram illustrating an example network node 110 in communication with an example UE 120 in a wireless network in accordance with the present disclosure.

[0062] As shown in FIG. 2, the network node 110 may include a data source 212, a transmit processor 214, a transmit (TX) MIMO processor 216, a set of modems 232 (shown as 232a through 232t, where $t \geq 1$), a set of antennas 234 (shown as 234a through 234v, where $v \geq 1$), a MIMO detector 236, a receive processor 238, a data sink 239, a controller/processor 240, a memory 242, a communication unit 244, a scheduler 246, and/or a communication manager 150, among other examples. In some configurations, one or a combination of the antenna(s) 234, the modem(s) 232, the MIMO detector 236, the receive processor 238, the transmit processor 214, and/or the TX MIMO processor 216 may be included in a transceiver of the network node 110. The transceiver may be under control of and used by one or more processors, such as the controller/processor 240, and in some aspects in conjunction with processor-readable code stored in the memory 242, to perform aspects of the methods, processes, and/or operations described herein. In some aspects, the network node 110 may include one or more

interfaces, communication components, and/or other components that facilitate communication with the UE 120 or another network node.

[0063] The terms “processor,” “controller,” or “controller/processor” may refer to one or more controllers and/or one or more processors. For example, reference to “a/the processor,” “a/the controller/processor,” or the like (in the singular) should be understood to refer to any one or more of the processors described in connection with FIG. 2, such as a single processor or a combination of multiple different processors. Reference to “one or more processors” should be understood to refer to any one or more of the processors described in connection with FIG. 2. For example, one or more processors of the network node 110 may include transmit processor 214, TX MIMO processor 216, MIMO detector 236, receive processor 238, and/or controller/processor 240. Similarly, one or more processors of the UE 120 may include MIMO detector 256, receive processor 258, transmit processor 264, TX MIMO processor 266, and/or controller/processor 280.

[0064] In some aspects, a single processor may perform all of the operations described as being performed by the one or more processors. In some aspects, a first set of (one or more) processors of the one or more processors may perform a first operation described as being performed by the one or more processors, and a second set of (one or more) processors of the one or more processors may perform a second operation described as being performed by the one or more processors. The first set of processors and the second set of processors may be the same set of processors or may be different sets of processors. Reference to “one or more memories” should be understood to refer to any one or more memories of a corresponding device, such as the memory described in connection with FIG. 2. For example, operation described as being performed by one or more memories can be performed by the same subset of the one or more memories or different subsets of the one or more memories.

[0065] For downlink communication from the network node 110 to the UE 120, the transmit processor 214 may receive data (“downlink data”) intended for the UE 120 (or a set of UEs that includes the UE 120) from the data source 212 (such as a data pipeline or a data queue). In some examples, the transmit processor 214 may select one or more MCSs for the UE 120 in accordance with one or more channel quality indicators (CQIs) received from the UE 120. The network node 110 may process the data (for example, including encoding the data) for transmission to the UE 120 on a downlink in accordance with the MCS(s) selected for the UE 120 to generate data symbols. The transmit processor 214 may process system information (for example, semi-static resource partitioning information (SRPI)) and/or control information (for example, CQI requests, grants, and/or upper layer signaling) and provide overhead symbols and/or control symbols. The transmit processor 214 may generate reference symbols for reference signals (for example, a cell-specific reference signal (CRS), a demodulation reference signal (DMRS), or a channel state information (CSI) reference signal (CSI-RS)) and/or synchronization signals (for example, a primary synchronization signal (PSS) or a secondary synchronization signals (SSS)).

[0066] The TX MIMO processor 216 may perform spatial processing (for example, precoding) on the data symbols, the control symbols, the overhead symbols, and/or the reference symbols, if applicable, and may provide a set of

output symbol streams (for example, T output symbol streams) to the set of modems 232. For example, each output symbol stream may be provided to a respective modulator component (shown as MOD) of a modem 232. Each modem 232 may use the respective modulator component to process (for example, to modulate) a respective output symbol stream (for example, for orthogonal frequency division multiplexing (OFDM)) to obtain an output sample stream. Each modem 232 may further use the respective modulator component to process (for example, convert to analog, amplify, filter, and/or upconvert) the output sample stream to obtain a time domain downlink signal. The modems 232a through 232r may together transmit a set of downlink signals (for example, T downlink signals) via the corresponding set of antennas 234.

[0067] A downlink signal may include a DCI communication, a MAC control element (MAC-CE) communication, an RRC communication, a downlink reference signal, or another type of downlink communication. Downlink signals may be transmitted on a PDCCH, a PDSCH, and/or on another downlink channel. A downlink signal may carry one or more transport blocks (TBs) of data. A TB may be a unit of data that is transmitted over an air interface in the wireless communication network 100. A data stream (for example, from the data source 212) may be encoded into multiple TBs for transmission over the air interface. The quantity of TBs used to carry the data associated with a particular data stream may be associated with a TB size common to the multiple TBs. The TB size may be based on or otherwise associated with radio channel conditions of the air interface, the MCS used for encoding the data, the downlink resources allocated for transmitting the data, and/or another parameter. In general, the larger the TB size, the greater the amount of data that can be transmitted in a single transmission, which reduces signaling overhead. However, larger TB sizes may be more prone to transmission and/or reception errors than smaller TB sizes, but such errors may be mitigated by more robust error correction techniques.

[0068] For uplink communication from the UE 120 to the network node 110, uplink signals from the UE 120 may be received by an antenna 234, may be processed by a modem 232 (for example, a demodulator component, shown as DEMOD, of a modem 232), may be detected by the MIMO detector 236 (for example, a receive (Rx) MIMO processor) if applicable, and/or may be further processed by the receive processor 238 to obtain decoded data and/or control information. The receive processor 238 may provide the decoded data to a data sink 239 (which may be a data pipeline, a data queue, and/or another type of data sink) and provide the decoded control information to a processor, such as the controller/processor 240.

[0069] The network node 110 may use the scheduler 246 to schedule one or more UEs 120 for downlink or uplink communications. In some aspects, the scheduler 246 may use DCI to dynamically schedule DL transmissions to the UE 120 and/or UL transmissions from the UE 120. In some examples, the scheduler 246 may allocate recurring time domain resources and/or frequency domain resources that the UE 120 may use to transmit and/or receive communications using an RRC configuration (for example, a semi-static configuration), for example, to perform semi-persistent scheduling (SPS) or to configure a configured grant (CG) for the UE 120.

[0070] One or more of the transmit processor 214, the TX MIMO processor 216, the modem 232, the antenna 234, the MIMO detector 236, the receive processor 238, and/or the controller/processor 240 may be included in an RF chain of the network node 110. An RF chain may include one or more filters, mixers, oscillators, amplifiers, analog-to-digital converters (ADCs), and/or other devices that convert between an analog signal (such as for transmission or reception via an air interface) and a digital signal (such as for processing by one or more processors of the network node 110). In some aspects, the RF chain may be or may be included in a transceiver of the network node 110.

[0071] In some examples, the network node 110 may use the communication unit 244 to communicate with a core network and/or with other network nodes. The communication unit 244 may support wired and/or wireless communication protocols and/or connections, such as Ethernet, optical fiber, common public radio interface (CPRI), and/or a wired or wireless backhaul, among other examples. The network node 110 may use the communication unit 244 to transmit and/or receive data associated with the UE 120 or to perform network control signaling, among other examples. The communication unit 244 may include a transceiver and/or an interface, such as a network interface.

[0072] The UE 120 may include a set of antennas 252 (shown as antennas 252a through 252r, where $r \geq 1$), a set of modems 254 (shown as modems 254a through 254u, where $u \geq 1$), a MIMO detector 256, a receive processor 258, a data sink 260, a data source 262, a transmit processor 264, a TX MIMO processor 266, a controller/processor 280, a memory 282, and/or a communication manager 140, among other examples. One or more of the components of the UE 120 may be included in a housing 284. In some aspects, one or a combination of the antenna(s) 252, the modem(s) 254, the MIMO detector 256, the receive processor 258, the transmit processor 264, or the TX MIMO processor 266 may be included in a transceiver that is included in the UE 120. The transceiver may be under control of and used by one or more processors, such as the controller/processor 280, and in some aspects in conjunction with processor-readable code stored in the memory 282, to perform aspects of the methods, processes, or operations described herein. In some aspects, the UE 120 may include another interface, another communication component, and/or another component that facilitates communication with the network node 110 and/or another UE 120.

[0073] For downlink communication from the network node 110 to the UE 120, the set of antennas 252 may receive the downlink communications or signals from the network node 110 and may provide a set of received downlink signals (for example, R received signals) to the set of modems 254. For example, each received signal may be provided to a respective demodulator component (shown as DEMOD) of a modem 254. Each modem 254 may use the respective demodulator component to condition (for example, filter, amplify, downconvert, and/or digitize) a received signal to obtain input samples. Each modem 254 may use the respective demodulator component to further demodulate or process the input samples (for example, for OFDM) to obtain received symbols. The MIMO detector 256 may obtain received symbols from the set of modems 254, may perform MIMO detection on the received symbols if applicable, and may provide detected symbols. The receive processor 258 may process (for example, decode) the detected symbols,

may provide decoded data for the UE 120 to the data sink 260 (which may include a data pipeline, a data queue, and/or an application executed on the UE 120), and may provide decoded control information and system information to the controller/processor 280.

[0074] For uplink communication from the UE 120 to the network node 110, the transmit processor 264 may receive and process data (“uplink data”) from a data source 262 (such as a data pipeline, a data queue, and/or an application executed on the UE 120) and control information from the controller/processor 280. The control information may include one or more parameters, feedback, one or more signal measurements, and/or other types of control information. In some aspects, the receive processor 258 and/or the controller/processor 280 may determine, for a received signal (such as received from the network node 110 or another UE), one or more parameters relating to transmission of the uplink communication. The one or more parameters may include a reference signal received power (RSRP) parameter, a received signal strength indicator (RSSI) parameter, a reference signal received quality (RSRQ) parameter, a CQI parameter, or a transmit power control (TPC) parameter, among other examples. The control information may include an indication of the RSRP parameter, the RSSI parameter, the RSRQ parameter, the CQI parameter, the TPC parameter, and/or another parameter. The control information may facilitate parameter selection and/or scheduling for the UE 120 by the network node 110.

[0075] The transmit processor 264 may generate reference symbols for one or more reference signals, such as an uplink DMRS, an uplink sounding reference signal (SRS), and/or another type of reference signal. The symbols from the transmit processor 264 may be precoded by the TX MIMO processor 266, if applicable, and further processed by the set of modems 254 (for example, for DFT-s-OFDM or CP-OFDM). The TX MIMO processor 266 may perform spatial processing (for example, precoding) on the data symbols, the control symbols, the overhead symbols, and/or the reference symbols, if applicable, and may provide a set of output symbol streams (for example, U output symbol streams) to the set of modems 254. For example, each output symbol stream may be provided to a respective modulator component (shown as MOD) of a modem 254. Each modem 254 may use the respective modulator component to process (for example, to modulate) a respective output symbol stream (for example, for OFDM) to obtain an output sample stream. Each modem 254 may further use the respective modulator component to process (for example, convert to analog, amplify, filter, and/or upconvert) the output sample stream to obtain an uplink signal.

[0076] The modems 254a through 254u may transmit a set of uplink signals (for example, R uplink signals or U uplink signals) via the corresponding set of antennas 252. An uplink signal may include a UCI communication, a MAC-CE communication, an RRC communication, or another type of uplink communication. Uplink signals may be transmitted on a PUSCH, a PUCCH, and/or another type of uplink channel. An uplink signal may carry one or more TBs of data. Sidelink data and control transmissions (that is, transmissions directly between two or more UEs 120) may generally use similar techniques as were described for uplink data and control transmission, and may use sidelink-specific channels such as a physical sidelink shared channel

(PSSCH), a physical sidelink control channel (PSCCH), and/or a physical sidelink feedback channel (PSFCH).

[0077] One or more antennas of the set of antennas 252 or the set of antennas 234 may include, or may be included within, one or more antenna panels, one or more antenna groups, one or more sets of antenna elements, or one or more antenna arrays, among other examples. An antenna panel, an antenna group, a set of antenna elements, or an antenna array may include one or more antenna elements (within a single housing or multiple housings), a set of coplanar antenna elements, a set of non-coplanar antenna elements, or one or more antenna elements coupled with one or more transmission or reception components, such as one or more components of FIG. 2. As used herein, “antenna” can refer to one or more antennas, one or more antenna panels, one or more antenna groups, one or more sets of antenna elements, or one or more antenna arrays. “Antenna panel” can refer to a group of antennas (such as antenna elements) arranged in an array or panel, which may facilitate beamforming by manipulating parameters of the group of antennas. “Antenna module” may refer to circuitry including one or more antennas, which may also include one or more other components (such as filters, amplifiers, or processors) associated with integrating the antenna module into a wireless communication device.

[0078] In some examples, each of the antenna elements of an antenna 234 or an antenna 252 may include one or more sub-elements for radiating or receiving radio frequency signals. For example, a single antenna element may include a first sub-element cross-polarized with a second sub-element that can be used to independently transmit cross-polarized signals. The antenna elements may include patch antennas, dipole antennas, and/or other types of antennas arranged in a linear pattern, a two-dimensional pattern, or another pattern. A spacing between antenna elements may be such that signals with a desired wavelength transmitted separately by the antenna elements may interact or interfere constructively and destructively along various directions (such as to form a desired beam). For example, given an expected range of wavelengths or frequencies, the spacing may provide a quarter wavelength, a half wavelength, or another fraction of a wavelength of spacing between neighboring antenna elements to allow for the desired constructive and destructive interference patterns of signals transmitted by the separate antenna elements within that expected range.

[0079] The amplitudes and/or phases of signals transmitted via antenna elements and/or sub-elements may be modulated and shifted relative to each other (such as by manipulating phase shift, phase offset, and/or amplitude) to generate one or more beams, which is referred to as beamforming. The term “beam” may refer to a directional transmission of a wireless signal toward a receiving device or otherwise in a desired direction. “Beam” may also generally refer to a direction associated with such a directional signal transmission, a set of directional resources associated with the signal transmission (for example, an angle of arrival, a horizontal direction, and/or a vertical direction), and/or a set of parameters that indicate one or more aspects of a directional signal, a direction associated with the signal, and/or a set of directional resources associated with the signal. In some implementations, antenna elements may be individually selected or deselected for directional transmission of a signal (or signals) by controlling amplitudes of one or more corresponding amplifiers and/or phases of the signal(s) to

form one or more beams. The shape of a beam (such as the amplitude, width, and/or presence of side lobes) and/or the direction of a beam (such as an angle of the beam relative to a surface of an antenna array) can be dynamically controlled by modifying the phase shifts, phase offsets, and/or amplitudes of the multiple signals relative to each other.

[0080] Different UEs **120** or network nodes **110** may include different numbers of antenna elements. For example, a UE **120** may include a single antenna element, two antenna elements, four antenna elements, eight antenna elements, or a different number of antenna elements. As another example, a network node **110** may include eight antenna elements, 24 antenna elements, 64 antenna elements, 128 antenna elements, or a different number of antenna elements. Generally, a larger number of antenna elements may provide increased control over parameters for beam generation relative to a smaller number of antenna elements, whereas a smaller number of antenna elements may be less complex to implement and may use less power than a larger number of antenna elements. Multiple antenna elements may support multiple-layer transmission, in which a first layer of a communication (which may include a first data stream) and a second layer of a communication (which may include a second data stream) are transmitted using the same time and frequency resources with spatial multiplexing.

[0081] While blocks in FIG. 2 are illustrated as distinct components, the functions described above with respect to the blocks may be implemented in a single hardware, software, or combination component or in various combinations of components. For example, the functions described with respect to the transmit processor **264**, the receive processor **258**, and/or the TX MIMO processor **266** may be performed by or under the control of the controller/processor **280**.

[0082] FIG. 3 is a diagram illustrating an example disaggregated base station architecture **300** in accordance with the present disclosure. One or more components of the example disaggregated base station architecture **300** may be, may include, or may be included in one or more network nodes (such one or more network nodes **110**). The disaggregated base station architecture **300** may include a CU **310** that can communicate directly with a core network **320** via a backhaul link, or that can communicate indirectly with the core network **320** via one or more disaggregated control units, such as a Non-RT RIC **350** associated with a Service Management and Orchestration (SMO) Framework **360** and/or a Near-RT RIC **370** (for example, via an E2 link). The CU **310** may communicate with one or more DUs **330** via respective midhaul links, such as via F1 interfaces. Each of the DUs **330** may communicate with one or more RUs **340** via respective fronthaul links. Each of the RUs **340** may communicate with one or more UEs **120** via respective RF access links. In some deployments, a UE **120** may be simultaneously served by multiple RUs **340**.

[0083] Each of the components of the disaggregated base station architecture **300**, including the CUs **310**, the DUs **330**, the RUs **340**, the Near-RT RICs **370**, the Non-RT RICs **350**, and the SMO Framework **360**, may include one or more interfaces or may be coupled with one or more interfaces for receiving or transmitting signals, such as data or information, via a wired or wireless transmission medium.

[0084] In some aspects, the CU **310** may be logically split into one or more CU user plane (CU-UP) units and one or more CU control plane (CU-CP) units. A CU-UP unit may

communicate bidirectionally with a CU-CP unit via an interface, such as the E1 interface when implemented in an O-RAN configuration. The CU **310** may be deployed to communicate with one or more DUs **330**, as necessary, for network control and signaling. Each DU **330** may correspond to a logical unit that includes one or more base station functions to control the operation of one or more RUs **340**. For example, a DU **330** may host various layers, such as an RLC layer, a MAC layer, or one or more PHY layers, such as one or more high PHY layers or one or more low PHY layers. Each layer (which also may be referred to as a module) may be implemented with an interface for communicating signals with other layers (and modules) hosted by the DU **330**, or for communicating signals with the control functions hosted by the CU **310**. Each RU **340** may implement lower layer functionality. In some aspects, real-time and non-real-time aspects of control and user plane communication with the RU(s) **340** may be controlled by the corresponding DU **330**.

[0085] The SMO Framework **360** may support RAN deployment and provisioning of non-virtualized and virtualized network elements. For non-virtualized network elements, the SMO Framework **360** may support the deployment of dedicated physical resources for RAN coverage requirements, which may be managed via an operations and maintenance interface, such as an O1 interface. For virtualized network elements, the SMO Framework **360** may interact with a cloud computing platform (such as an open cloud (O-Cloud) platform **390**) to perform network element life cycle management (such as to instantiate virtualized network elements) via a cloud computing platform interface, such as an O2 interface. A virtualized network element may include, but is not limited to, a CU **310**, a DU **330**, an RU **340**, a non-RT RIC **350**, and/or a Near-RT RIC **370**. In some aspects, the SMO Framework **360** may communicate with a hardware aspect of a 4G RAN, a 5G NR RAN, and/or a 6G RAN, such as an open eNB (O-eNB) **380**, via an O1 interface. Additionally or alternatively, the SMO Framework **360** may communicate directly with each of one or more RUs **340** via a respective O1 interface. In some deployments, this configuration can enable each DU **330** and the CU **310** to be implemented in a cloud-based RAN architecture, such as a vRAN architecture.

[0086] The Non-RT RIC **350** may include or may implement a logical function that enables non-real-time control and optimization of RAN elements and resources, AI/ML workflows including model training and updates, and/or policy-based guidance of applications and/or features in the Near-RT RIC **370**. The Non-RT RIC **350** may be coupled to or may communicate with (such as via an A1 interface) the Near-RT RIC **370**. The Near-RT RIC **370** may include or may implement a logical function that enables near-real-time control and optimization of RAN elements and resources via data collection and actions via an interface (such as via an E2 interface) connecting one or more CUs **310**, one or more DUs **330**, and/or an O-eNB with the Near-RT RIC **370**.

[0087] In some aspects, to generate AI/ML models to be deployed in the Near-RT RIC **370**, the Non-RT RIC **350** may receive parameters or external enrichment information from external servers. Such information may be utilized by the Near-RT RIC **370** and may be received at the SMO Framework **360** or the Non-RT RIC **350** from non-network data sources or from network functions. In some examples, the

Non-RT RIC 350 or the Near-RT RIC 370 may tune RAN behavior or performance. For example, the Non-RT RIC 350 may monitor long-term trends and patterns for performance and may employ AI/ML models to perform corrective actions via the SMO Framework 360 (such as reconfiguration via an O1 interface) or via creation of RAN management policies (such as A1 interface policies).

[0088] The network node 110, the controller/processor 240 of the network node 110, the UE 120, the controller/processor 280 of the UE 120, the CU 310, the DU 330, the RU 340, or any other component(s) of FIG. 1, 2, or 3 may implement one or more techniques or perform one or more operations associated with system information block communication, as described in more detail elsewhere herein. For example, the controller/processor 240 of the network node 110, the controller/processor 280 of the UE 120, any other component(s) of FIG. 2, the CU 310, the DU 330, or the RU 340 may perform or direct operations of, for example, process 1100 of FIG. 11, process 1200 of FIG. 12, or other processes as described herein (alone or in conjunction with one or more other processors). The memory 242 may store data and program codes for the network node 110, the network node 110, the CU 310, the DU 330, or the RU 340. The memory 282 may store data and program codes for the UE 120. In some examples, the memory 242 or the memory 282 may include a non-transitory computer-readable medium storing a set of instructions (for example, code or program code) for wireless communication. The memory 242 may include one or more memories, such as a single memory or multiple different memories (of the same type or of different types). The memory 282 may include one or more memories, such as a single memory or multiple different memories (of the same type or of different types). For example, the set of instructions, when executed (for example, directly, or after compiling, converting, or interpreting) by one or more processors of the network node 110, the UE 120, the CU 310, the DU 330, or the RU 340, may cause the one or more processors to perform process 1100 of FIG. 11, process 1200 of FIG. 12, or other processes as described herein. In some examples, executing instructions may include running the instructions, converting the instructions, compiling the instructions, and/or interpreting the instructions, among other examples.

[0089] In some aspects, the UE 120 includes means for receiving configuration information that includes one or more parameters for a system information block process; means for transmitting, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and/or means for receiving the system information block in accordance with the configuration information and the uplink signal. The means for the UE 120 to perform operations described herein may include, for example, one or more of communication manager 140, antenna 252, modem 254, MIMO detector 256, receive processor 258, transmit processor 264, TX MIMO processor 266, controller/processor 280, or memory 282.

[0090] In some aspects, the network node 110 includes means for receiving an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and/or means for transmitting the system information block in accordance with the uplink signal. The means

for the network node 110 to perform operations described herein may include, for example, one or more of communication manager 150, transmit processor 214, TX MIMO processor 216, modem 232, antenna 234, MIMO detector 236, receive processor 238, controller/processor 240, memory 242, or scheduler 246.

[0091] As indicated above, FIG. 3 is provided as an example. Other examples may differ from what is described with regard to FIG. 3.

[0092] FIG. 4 is a diagram illustrating an example 400 of contention-free random-access and an example 405 of contention-based random-access, in accordance with the present disclosure.

[0093] Contention-free random-access (CFRA) and contention-based random-access (CBRA) are two methods used in communication networks to establish initial access between a UE and a network node. In CFRA, the network node may explicitly allocate resources for random access attempts to the UE. This allocation may be based at least in part on prior communications, specific service requirements, and/or UE behavior patterns. CFRA may reduce collisions in the network, for example, since each UE may be provided a unique opportunity to access the network. Therefore, CFRA may be beneficial when fast and reliable access to the network is critical. As shown in the example 400 and by reference number 410, the network node 110 may transmit, and the UE 120 may receive, a synchronization signal block (SSB). As shown by reference number 415, the network node 110 may transmit, and the UE 120 may receive, a SIB (such as a SIB1). In some examples, the SIB1 may include one or more random access (RA) resources included in a SI request configuration (SI-RequestConfig) message. The RA resources may be linked to one or more requested SI messages. As shown by reference number 420, the UE 120 may transmit, and the network node 110 may receive, a Message 1 (Msg1). The Msg1 may be used to request other system information (OSI). The Msg 1 may include a preamble on a random access channel (RACH) during a specified time slot. The network node 110 may assign the unique random access preamble via dedicated signaling, for example, during a handover or when the network has prior knowledge that the UE needs to access the network quickly. As shown by reference number 425, the network node 110 may transmit, and the UE 120 may receive, a Message 2 (Msg2). The Msg2 may include a random access response (RAR). The random access response may include a random access preamble identifier (RAPID). The random access response may include timing advance information and an initial uplink resource grant, which may allow the UE 120 to adjust transmission timing for uplink synchronization. As shown by reference number 430, the network node 110 may transmit, and the UE 120 may receive, one or more requested SI messages. The UE 120 may monitor an OSI PDCCCH after receiving the Msg2.

[0094] Contention-based random-access (CBRA) is a method where multiple UEs compete for the same set of resources to initiate access to the network. As shown by reference number 435, the network node 110 may transmit, and the UE 120 may receive, an SSB. As shown by reference number 440, the network node 110 may transmit, and the UE 120 may receive, a SIB (such as a SIB1). As shown by reference number 445, the UE 120 may transmit, and the network node 110 may receive, a Message 1 (Msg1). The UE 120 may select a preamble from a common pool of

preambles without information of other UEs are using the same preamble simultaneously. The preamble may be included in the Msg1. In some examples, the UE 120 may randomly select one or more random access resources. As shown by reference number 450, the network node 110 may transmit, and the UE 120 may receive, a Message 2 (Msg2). The Msg2 may include a timing advance command, a temporary cell radio network temporary identifier, and/or an uplink grant. As shown by reference number 455, the UE 120 may transmit, and the network node 110 may receive, a Message 3 (Msg3). The Msg3 may include a connection request. For example, the Msg3 may include an RRC system information request (RRCSystemInfoRequest). In some examples, the Msg3 may include a bitmap of one or more requested SI messages. As shown by reference number 460, the network node 110 may transmit, and the UE 120 may receive, a Message 4 (Msg4). The Msg4 may include connection setup information. As shown by reference number 465, the network node 110 may transmit, and the UE 120 may receive, one or more requested SI messages. The UE 120 may monitor an OSI PDCCH after receiving the Msg4.

[0095] As indicated above, FIG. 4 is provided as an example. Other examples may differ from what is described with regard to FIG. 4.

[0096] FIGS. 5A-5B are diagrams illustrating examples of system information block procedure configurations, in accordance with the present disclosure.

[0097] An idle UE (for example, a UE operating in an RRC idle state or an RRC inactive state) may obtain an OD-SIB1 procedure configuration from a cell. As shown FIG. 5A and example 500, an OD-SIB1 may be received from Carrier A 505. An idle or connected mode operation in Carrier A 505 or Carrier B 510 may be dependent on a corresponding cell quality. For example, a UE may select Carrier B 510 in accordance with Carrier B 510 having a higher quality (for example, a higher SSB RSRP) than Carrier A 505. The OD-SIB1 may be triggered in a cell associated with Carrier B 510 when the UE selects the cell for an idle mode operation or a RACH and/or when the UE performs a handover to the cell associated with Carrier B 510. As shown in example 515, the UE 120 may perform a handover from Cell A 520 to Cell B 525. In some examples, Cell A 520 may be associated with a residential area and Cell B 525 may be associated with a commercial area. Cell A 520 may be associated with an always-on SSB and SIB1 providing an OD-SIB1 procedure configuration. The SIB1 may be triggered when at least one idle UE camps in the cell or performs a handover to the cell. These example operations may be supported in a common on-demand SIB1 configuration framework (for example, in a frequencyBand indicator included in downlink frequency information).

[0098] As shown in FIG. 5B and example 530, a UE may share an OD-SIB1 configuration with one or more other UEs. For example, a first cell 535 may provide a first UE 120 (UE 120-1) with an always-on SSB and SIB1 providing OD-SIB1 procedure configuration. The UE 120-1 may provide the OD-SIB1 procedure configuration to a second UE (UE 120-2) associated with a second cell 540. Additionally, the UE 120-2 may provide the OD-SIB1 procedure configuration to a third UE (UE 120-3) associated with the second cell 540. The UEs may share the OD-SIB1 procedure configuration via sidelink. Some sidelink procedures (such as a sidelink discovery procedure) may be modified to enable OD-SIB1 procedure configuration sharing.

[0099] As indicated above, FIGS. 5A-5B are provided as examples. Other examples may differ from what is described with regard to FIGS. 5A-5B.

[0100] FIG. 6 is a diagram illustrating an example 600 of system information block communications, in accordance with the present disclosure. A UE 120-1 may communicate with a network node 110-1 and at least one of a network node 110-2 or a UE 120-2.

[0101] As shown by reference number 605, the UE 120-1 may receive configuration information that includes one or more parameters for a SIB process. In some aspects, the UE 120-1 may receive the configuration information from the network node 110-2. In some other aspects, the UE 120-1 may receive the configuration information from the UE 120-2. In some aspects, the configuration information may include one or more parameters for an OD-SIB1 process. Example parameters for a Message 1 based OD-SIB1 process (for example, a CFRA-based OD-SIB1 process) are shown in Table 1 below. Parameters in bold text may correspond to configurable parameters.

TABLE 1

Aspects	Related RRC parameters
Frame	tdd-UL-DL-ConfigurationCommon
Structure SSB	ssb-PositionsInBurst , ss-PBCH-BlockPower , rsrp-ThresholdSSB SMTC (including absoluteFrequencySSB), offsetToPointA
UL/DL BWP	locationAndBandwidth, SCS
DL frequency information	frequencyBand
UL frequency information	FDD/SUL: frequencyBand, absoluteFrequencyPointA p-Max, additionalSpectrumEmission
RACH	prach-ConfigurationIndex msg1-FDM , msg1-FrequencyStart , ssb-perRACH-Occasion, ra-ssb-OccasionMaskIndex prach-RootSequenceIndex, zeroCorrelationZoneConfig, restrictedSetConfig, ra-PreambleIndex msg1-SubcarrierSpacing , preambleReceivedTargetPower , preambleTransMax, powerRampingStep ra-ResponseWindow

[0102] Example parameters for a Message 3 based OD-SIB1 process (for example, a CBRA-based OD-SIB1 process) are shown in Table 2 below. Parameters in bold text may correspond to configurable parameters.

TABLE 2

Aspects	Related RRC parameters
Frame	tdd-UL-DL-ConfigurationCommon
Structure SSB	ssb-PositionsInBurst , ss-PBCH-BlockPower , rsrp-ThresholdSSB SMTC (including absoluteFrequencySSB), offsetToPointA

TABLE 2-continued

Aspects	Related RRC parameters
UL/DL BWP	locationAndBandwidth, SCS
DL frequency information	frequencyBand
UL frequency information	FDD/SUL: frequencyBand, absoluteFrequencyPointA
RACH	p-Max, additionalSpectrumEmission prach-ConfigurationIndex msg1-FDM , msg1-FrequencyStart , prach-RootSequenceIndex, zeroCorrelationZoneConfig, restrictedSetConfig, msg1-SubcarrierSpacing , preambleReceivedTargetPower , preambleTransMax, powerRampingStep ra-ResponseWindow totalNumberOfRA-Preambles, ssb-perRACH-OccasionAndCB-PreamblesPerSSB, ra-ContentionResolutionTimer msg3-transformPrecoder controlResourceSetZero, searchSpaceSIB1, ra-SearchSpace
PDCCH	pdsch-TimeDomainAllocationList pusch-TimeDomainAllocationList, groupHoppingEnabledTransformPrecoding, msg3-DeltaPreamble

[0103] As shown by reference number 610, the UE 120-1 may transmit, and the network node 110-1 may receive, an uplink signal that includes a message, where the message indicates a request for a SIB. The UE 120-1 may transmit the uplink signal in accordance with the configuration information. For example, the UE 120-1 may transmit the uplink signal in accordance with the one or more parameters.

[0104] In some cases, there may be no guarantee that the network node 110-1 is to send the SIB1 in the earliest SIB1 occasion after OD-SIB1 triggering. Additionally, or alternatively, the UE 120-1 may need to be configured with information that indicates whether the SIB1 is transmitted in all SIB1 occasions (e.g., periodically) after OD-SIB1 triggering or whether the SIB1 is transmitted in only a subset of the occasions. In some aspects, the network node 110-1 may configure the UE 120-1 with a time duration during which the SIB1 is to be transmitted. The time duration may be indicated in terms of a quantity of SIB1 occasions. In some aspects, if the configuration is not provided, the UE 120-1 may be configured to identify that the SIB1 is transmitted in all SIB1 occasions after OD-SIB1 triggering. Additional details regarding these features are described, for example, in connection with FIG. 8.

[0105] In some cases, the network node 110-1 may not transmit the OD-SIB1 in correspondence to all transmitted SSBs. In some aspects, the UE 120-1 may be configured to provide an SSB measurement report in a Msg3 associated with a CBRA-based OD-SIB1 procedure. The measurement report may enable the network node 110-1 to determine suitable beams. For example, the measurement report may enable the network node 110-1 to determine suitable beams for SIB1 transmissions and/or for one or more subsequent procedures. Additional details regarding these features are described, for example, in connection with FIG. 9.

[0106] In some cases, a joint RACH process may be supported for a SIB1 request and an RRC connection setup. This may be helpful, for example, when the UE 120-1 needs a SIB1 and a RACH to enter an RRC connected state. In some aspects, the network node 110-1 may transmit, and the UE 120-1 may receive, an RRC message. The RRC message may have a first format or a second format. An RRC message

having the first format may indicate a request for a SIB1 only. An RRC message having the second format may indicate a request for both a SIB1 and an RRC connection setup. The SIB1 may be unicast to the UE 120-1 using dedicated signaling. Whether the UE sends the RRC message with the first format or with the second format may depend on the RRC state that the UE operates. For example, if the UE requests SIB1 to perform RRC idle/inactive mode operations (e.g., cell reselection, paging reception, or system information update reception, among other examples), the UE may use the first format. In another example, if the UE requests SIB1 and RRC connection to go into the RRC connected mode, the UE may use the second format. Additional details regarding these features are described, for example, in connection with FIGS. 10A-10B.

[0107] As shown by reference number 615, the network node 110-1 may transmit, and the UE 120-1 may receive, the SIB (for example, the OD-SIB1) in accordance with the configuration information and the uplink signal. In some aspects, the SIB may be received in accordance with a Message 1 based random-access process. In some other aspects, the SIB may be received in accordance with a Message 3 based random-access process. Additional details regarding these features are described in connection with FIG. 7.

[0108] As indicated above, FIG. 6 is provided as an example. Other examples may differ from what is described with regard to FIG. 6.

[0109] FIG. 7 is a diagram illustrating an example 700 of a Message 1 based random-access process for on-demand system information block communication and an example 705 of a Message 3 based random-access for on-demand system information block communication, in accordance with the present disclosure.

[0110] As shown in the example 700 and by reference number 710, the network node 110 may transmit, and the UE 120 may receive, an SSB. As shown by reference number 715, the UE 120 may transmit, and the network node 110 may receive, a Msg1. The Msg1 may include a request for a SIB (such as a SIB1). As shown by reference number 720, the network node 110 may transmit, and the UE 120 may receive, a Msg2. The Msg2 may include a random access response, and the random access response may include a random access preamble identifier (RAPID). As shown by reference number 725, the network node 110 may transmit, and the UE 120 may receive, the SIB1.

[0111] As shown in the example 705 and by reference number 730, the network node 110 may transmit, and the UE 120 may receive, an SSB. As shown by reference number 735, the UE 120 may transmit, and the network node 110 may receive, a Msg1. As shown by reference number 740, the network node 110 may transmit, and the UE 120 may receive, a Msg2. As shown by reference number 745, the UE 120 may transmit, and the network node 110 may receive, a Msg3. The Msg3 may include a request for a SIB. For example, the Msg3 may include an RRCSIBIRequest. As shown by reference number 750, the network node 110 may transmit, and the UE 120 may receive, a Msg4. As shown by reference number 755, the network node 110 may transmit, and the UE 120 may receive, a SIB (for example, the SIB1).

[0112] As indicated above, FIG. 7 is provided as an example. Other examples may differ from what is described with regard to FIG. 7.

[0113] FIG. 8 is a diagram illustrating an example 800 of system information block transmission occasions, in accordance with the present disclosure. The network node 110 may transmit one or more SSBs 805 using one or more beams 810. The UE 120 and the network node 110 may perform OD-SIB1 triggering. For example, the UE 120 may transmit a Msg1 815 to the network node 110, and the network node 110 may transmit a Msg2 820 to the UE 120, as described herein. The network node 110 may be configured to send the SIB1 825 in accordance with a SIB1 PDCCH monitoring occasion (SIB1 PMO) periodicity 830. For example, the UE 120 may identify that the network node 110 is to transmit the SIB1 825 every 20 milliseconds (ms). However, it is not guaranteed that the network node 110 is to send the SIB1 in the earliest SIB1 PMO. In some aspects, the network node 110 may configure the UE 120 with a time duration during which the SIB1 is to be transmitted. The time duration may be indicated in terms of a quantity of SIB1 occasions. If the configuration is not provided, the UE 120 may be configured to identify that the SIB1 is transmitted in all SIB1 occasions after OD-SIB1 triggering.

[0114] As indicated above, FIG. 8 is provided as an example. Other examples may differ from what is described with regard to FIG. 8.

[0115] FIG. 9 is a diagram illustrating an example 900 of a Message 3 based random-access process for on-demand system information block communication, in accordance with the present disclosure. The network node 110 may transmit one or more SSBs 905 using one or more beams 910. The UE 120 and the network node 110 may perform a RACH process for the SIB1 request. For example, the UE 120 may transmit a Msg1 915 to the network node 110, the network node 110 may transmit a Msg2 920 to the UE 120, the UE 120 may transmit a Msg3 925 to the network node 110, the network node 110 may transmit a Msg4 930 to the UE 120, as described herein. The Msg3 may include an SSB measurement report. The network node 110 may transmit an OD-SIB1 935 using a subset of beams 940 and in accordance with a SIB1 PMO. For example, the network node 110 may transmit a second SIB 935 using a second beam 940 and may transmit a third SIB 935 using a third beam 940, but may not transmit a first SIB 935 using a first beam 940 or a fourth SIB 935 using a fourth beam 940.

[0116] As indicated above, FIG. 9 is provided as an example. Other examples may differ from what is described with regard to FIG. 9.

[0117] FIGS. 10A-10B are diagrams illustrating example of Message 3 based random-access processes for on-demand system information block communication, in accordance with the present disclosure. As shown in FIG. 10A and example 1000, the network node 110 may transmit one or more SSBs 1005 using one or more beams 1010. The UE 120 and the network node 110 may perform a RACH process for the SIB1 request. For example, the UE 120 may transmit a Msg1 1015 to the network node 110, the network node 110 may transmit a Msg2 1020 to the UE 120, the UE 120 may transmit a Msg3 1025 to the network node 110, the network node 110 may transmit a Msg4 1030 to the UE 120, as described herein. The Msg3 may include an SSB measurement report. In some aspects, the UE 120 may transmit an RRC message (e.g., an RRC message having a first format) that indicates for the network node 110 to perform an OD-SIB1 transmission 1035. Additionally, or alternatively, the UE 120 may transmit an RRC message (e.g., an RRC

message having a second format) that indicates for the network node 110 to perform an OD-SIB1 transmission 1035 and a RACH process 1040 associated with an RRC connection request. In some aspects, the network node 110 and/or the UE 120 may not be able to determine whether the SIB is to be unicast and/or to determine whether the RACH is to be performed.

[0118] As shown in FIG. 10B and example 1045, the network node 110 may transmit one or more SSBs 1005 using one or more beams 1010. The network node 110 and the UE 120 may perform a RACH for a SIB1 request and RRC connection setup. The RACH for the SIB1 request and RRC connection setup may include a Msg1 1050, a Msg2 1055, a Msg3 1060, and a Msg4 1065. After the RACH for the SIB1 request and RRC connection setup, the network node 110 may transmit a SIB1 1070 to the UE 120. The UE 120 may transmit a HARQ 1075 (for example, an ACK or NACK) indicating whether the SIB1 1070 has been received by the UE 120.

[0119] As indicated above, FIGS. 10A-10B are provided as examples. Other examples may differ from what is described with regard to FIGS. 10A-10B.

[0120] FIG. 11 is a diagram illustrating an example process 1100 performed, for example, at a UE or an apparatus of a UE, in accordance with the present disclosure. Example process 1100 is an example where the apparatus or the UE (e.g., UE 120) performs operations associated with system information block communications.

[0121] As shown in FIG. 11, in some aspects, process 1100 may include receiving configuration information that includes one or more parameters for a system information block process (block 1110). For example, the UE (e.g., using reception component 1302 and/or communication manager 1306, depicted in FIG. 13) may receive configuration information that includes one or more parameters for a system information block process, as described above.

[0122] As further shown in FIG. 11, in some aspects, process 1100 may include transmitting, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block (block 1120). For example, the UE (e.g., using transmission component 1304 and/or communication manager 1306, depicted in FIG. 13) may transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block, as described above.

[0123] As further shown in FIG. 11, in some aspects, process 1100 may include receiving the system information block in accordance with the configuration information and the uplink signal (block 1130). For example, the UE (e.g., using reception component 1302 and/or communication manager 1306, depicted in FIG. 13) may receive the system information block in accordance with the configuration information and the uplink signal, as described above.

[0124] Process 1100 may include additional aspects, such as any single aspect or any combination of aspects described below and/or in connection with one or more other processes described elsewhere herein.

[0125] In a first aspect, the system information block is an OD-SIB1.

[0126] In a second aspect, alone or in combination with the first aspect, the message is a Message 1 or a Message 3, and wherein transmitting the uplink signal that includes the message comprises transmitting the uplink signal via an

uplink channel that corresponds to a physical random access channel or a physical uplink shared channel.

[0127] In a third aspect, alone or in combination with one or more of the first and second aspects, process **1100** includes receiving, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier, and receiving the system information block in accordance with the configuration information, the uplink signal, and the random access response.

[0128] In a fourth aspect, alone or in combination with one or more of the first through third aspects, process **1100** includes transmitting, during a random-access process, a Message 3 that includes a radio resource control connection request, and receiving the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request.

[0129] In a fifth aspect, alone or in combination with one or more of the first through fourth aspects, the system information block is unicast to the UE via dedicated signaling.

[0130] In a sixth aspect, alone or in combination with one or more of the first through fifth aspects, the configuration information that includes the one or more parameters for system information block monitoring is included in a time-division duplexing uplink downlink configuration frame structure.

[0131] In a seventh aspect, alone or in combination with one or more of the first through sixth aspects, the configuration information includes one or more SSB parameters, one or more uplink BWP parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, and one or more RACH parameters.

[0132] In an eighth aspect, alone or in combination with one or more of the first through seventh aspects, the one or more SSB parameters include an SSB positions in burst parameter, a SS PBCH block power parameter, a RSRP threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a SCS parameter, wherein one or more the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, and wherein the one or more RACH parameters include a PRACH configuration index parameter, a Message 1 FDM parameter, a Message 1 frequency start parameter, an SSB-per-RACH occasion parameter, a random access SSB occasion mask index parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a random access preamble index parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, and a random access response window parameter.

[0133] In a ninth aspect, alone or in combination with one or more of the first through eighth aspects, the configuration information includes one or more SSB parameters, one or more uplink BWP parameters, one or more downlink BWP parameters, one or more downlink frequency information

parameters, one or more uplink frequency information parameters, one or more RACH parameters, one or more PDCCH parameters, one or more PDSCH parameters, and one or more PUSCH parameters.

[0134] In a tenth aspect, alone or in combination with one or more of the first through ninth aspects, the one or more SSB parameters include an SSB positions in burst parameter, a SS PBCH block power parameter, a RSRP threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a SCS parameter, wherein one or more the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, wherein the one or more RACH parameters include a PRACH configuration index parameter, a Message 1 FDM parameter, a Message 1 frequency start parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, a random access response window parameter, a total number of random access preambles parameter, an SSB-per-RACH-occasion-and-codebook-preambles-per-SSB parameter, a random access contention resolution timer parameter, and a Message 3 transform precoder parameter, wherein the one or more PDCCH parameters include a control resource set zero parameter, a search space system information block 1 parameter, and a random access search space parameter, wherein the one or more PDSCH parameters include a PDSCH time domain allocation list parameter, and wherein the one or more PUSCH parameters include a PUSCH time domain allocation list parameter, a group hopping enables transform precoding parameter, and a Message 3 delta preamble parameter.

[0135] In an eleventh aspect, alone or in combination with one or more of the first through tenth aspects, process **1100** includes receiving timing information that indicates a time duration during which the UE is to receive the system information block.

[0136] In a twelfth aspect, alone or in combination with one or more of the first through eleventh aspects, the time duration is indicated in accordance with a quantity of system information block PDCCH monitoring occasions or in accordance with a time duration.

[0137] In a thirteenth aspect, alone or in combination with one or more of the first through twelfth aspects, the UE configured to monitor for a system information block PDCCH transmission in a subset of system information block PDCCH monitoring occasions of the quantity of system information block PDCCH monitoring occasions.

[0138] In a fourteenth aspect, alone or in combination with one or more of the first through thirteenth aspects, process **1100** includes transmitting, during a random-access process, a Message 3 that includes a SSB measurement report.

[0139] In a fifteenth aspect, alone or in combination with one or more of the first through fourteenth aspects, process **1100** includes transmitting a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system informa-

tion block only and the second format indicates both a request for the system information block and a request for an RRC connection.

[0140] Although FIG. 11 shows example blocks of process 1100, in some aspects, process 1100 may include additional blocks, fewer blocks, different blocks, or differently arranged blocks than those depicted in FIG. 11. Additionally, or alternatively, two or more of the blocks of process 1100 may be performed in parallel.

[0141] FIG. 12 is a diagram illustrating an example process 1200 performed, for example, at a network node or an apparatus of a network node, in accordance with the present disclosure. Example process 1200 is an example where the apparatus or the network node (e.g., network node 110) performs operations associated with system information block communications.

[0142] As further in FIG. 12, in some aspects, process 1200 may include receiving an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process (block 1210). For example, the network node (e.g., using reception component 1402 and/or communication manager 1406, depicted in FIG. 14) may receive an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process, as described above.

[0143] As further shown in FIG. 12, in some aspects, process 1200 may include transmitting the system information block in accordance with the uplink signal (block 1220). For example, the network node (e.g., using transmission component 1404 and/or communication manager 1406, depicted in FIG. 14) may transmit the system information block in accordance with and the uplink signal, as described above.

[0144] Process 1200 may include additional aspects, such as any single aspect or any combination of aspects described below and/or in connection with one or more other processes described elsewhere herein.

[0145] In a first aspect, the system information block is an OD-SIB1.

[0146] In a second aspect, alone or in combination with the first aspect, the message is a Message 1 or a Message 3, and wherein receiving the uplink signal that includes the message comprises receiving the uplink signal via an uplink channel that corresponds to a physical random access channel or a physical uplink shared channel.

[0147] In a third aspect, alone or in combination with one or more of the first and second aspects, process 1200 includes transmitting, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier, and transmitting the system information block in accordance with the configuration information, the uplink signal, and the random access response.

[0148] In a fourth aspect, alone or in combination with one or more of the first through third aspects, process 1200 includes receiving, during a random-access process, a Message 3 that includes a radio resource control connection request, and transmitting the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request.

[0149] In a fifth aspect, alone or in combination with one or more of the first through fourth aspects, the system information block is unicast via dedicated signaling.

[0150] In a sixth aspect, alone or in combination with one or more of the first through fifth aspects, the configuration information that includes the one or more parameters for system information block monitoring is included in a time-division duplexing uplink downlink configuration frame structure.

[0151] In a seventh aspect, alone or in combination with one or more of the first through sixth aspects, the configuration information includes one or more SSB parameters, one or more uplink BWP parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, and one or more RACH parameters.

[0152] In an eighth aspect, alone or in combination with one or more of the first through seventh aspects, the one or more SSB parameters include an SSB positions in burst parameter, a SS PBCH block power parameter, a RSRP threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a SCS parameter, wherein one or more the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, and wherein the one or more RACH parameters include a PRACH configuration index parameter, a Message 1 FDM parameter, a Message 1 frequency start parameter, an SSB-per-RACH occasion parameter, a random access SSB occasion mask index parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a random access preamble index parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, and a random access response window parameter.

[0153] In a ninth aspect, alone or in combination with one or more of the first through eighth aspects, the configuration information includes one or more SSB parameters, one or more uplink BWP parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, one or more RACH parameters, one or more PDCCH parameters, one or more PDSCH parameters, and one or more PUSCH parameters.

[0154] In a tenth aspect, alone or in combination with one or more of the first through ninth aspects, the one or more SSB parameters include an SSB positions in burst parameter, a SS PBCH block power parameter, a RSRP threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a SCS parameter, wherein one or more the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, wherein the one or more

RACH parameters include a PRACH configuration index parameter, a Message 1 FDM parameter, a Message 1 frequency start parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, a random access response window parameter, a total number of random access preambles parameter, an SSB-per-RACH-occasion-and-codebook-preambles-per-SSB parameter, a random access contention resolution timer parameter, and a Message 3 transform precoder parameter, wherein the one or more PDCCH parameters include a control resource set zero parameter, a search space system information block 1 parameter, and a random access search space parameter, wherein the one or more PDSCH parameters include a PDSCH time domain allocation list parameter, and wherein the one or more PUSCH parameters include a PUSCH time domain allocation list parameter, a group hopping enables transform precoding parameter, and a Message 3 delta preamble parameter.

[0155] In an eleventh aspect, alone or in combination with one or more of the first through tenth aspects, process 1200 includes transmitting timing information that indicates a time duration during which a UE is to receive the system information block.

[0156] In a twelfth aspect, alone or in combination with one or more of the first through eleventh aspects, the time duration is indicated in accordance with a quantity of system information block PDCCH monitoring occasions or in accordance with a time duration.

[0157] In a thirteenth aspect, alone or in combination with one or more of the first through twelfth aspects, process 1200 includes receiving, during a random-access process, a Message 3 that includes a SSB measurement report.

[0158] In a fourteenth aspect, alone or in combination with one or more of the first through thirteenth aspects, process 1200 includes receiving a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system information block only and the second format indicates both a request for the system information block and a request for an RRC connection.

[0159] Although FIG. 12 shows example blocks of process 1200, in some aspects, process 1200 may include additional blocks, fewer blocks, different blocks, or differently arranged blocks than those depicted in FIG. 12. Additionally, or alternatively, two or more of the blocks of process 1200 may be performed in parallel.

[0160] FIG. 13 is a diagram of an example apparatus 1300 for wireless communication, in accordance with the present disclosure. The apparatus 1300 may be a UE, or a UE may include the apparatus 1300. In some aspects, the apparatus 1300 includes a reception component 1302, a transmission component 1304, and/or a communication manager 1306, which may be in communication with one another (for example, via one or more buses and/or one or more other components). In some aspects, the communication manager 1306 is the communication manager 140 described in connection with FIG. 1. As shown, the apparatus 1300 may communicate with another apparatus 1308, such as a UE or a network node (such as a CU, a DU, an RU, or a base station), using the reception component 1302 and the transmission component 1304.

[0161] In some aspects, the apparatus 1300 may be configured to perform one or more operations described herein in connection with FIGS. 6-10. Additionally, or alternatively, the apparatus 1300 may be configured to perform one or more processes described herein, such as process 1100 of FIG. 11. In some aspects, the apparatus 1300 and/or one or more components shown in FIG. 13 may include one or more components of the UE described in connection with FIG. 2. Additionally, or alternatively, one or more components shown in FIG. 13 may be implemented within one or more components described in connection with FIG. 2. Additionally, or alternatively, one or more components of the set of components may be implemented at least in part as software stored in one or more memories. For example, a component (or a portion of a component) may be implemented as instructions or code stored in a non-transitory computer-readable medium and executable by one or more controllers or one or more processors to perform the functions or operations of the component.

[0162] The reception component 1302 may receive communications, such as reference signals, control information, data communications, or a combination thereof, from the apparatus 1308. The reception component 1302 may provide received communications to one or more other components of the apparatus 1300. In some aspects, the reception component 1302 may perform signal processing on the received communications (such as filtering, amplification, demodulation, analog-to-digital conversion, demultiplexing, deinterleaving, de-mapping, equalization, interference cancellation, or decoding, among other examples), and may provide the processed signals to the one or more other components of the apparatus 1300. In some aspects, the reception component 1302 may include one or more antennas, one or more modems, one or more demodulators, one or more MIMO detectors, one or more receive processors, one or more controllers/processors, one or more memories, or a combination thereof, of the UE described in connection with FIG. 2.

[0163] The transmission component 1304 may transmit communications, such as reference signals, control information, data communications, or a combination thereof, to the apparatus 1308. In some aspects, one or more other components of the apparatus 1300 may generate communications and may provide the generated communications to the transmission component 1304 for transmission to the apparatus 1308. In some aspects, the transmission component 1304 may perform signal processing on the generated communications (such as filtering, amplification, modulation, digital-to-analog conversion, multiplexing, interleaving, mapping, or encoding, among other examples), and may transmit the processed signals to the apparatus 1308. In some aspects, the transmission component 1304 may include one or more antennas, one or more modems, one or more modulators, one or more transmit MIMO processors, one or more transmit processors, one or more controllers/processors, one or more memories, or a combination thereof, of the UE described in connection with FIG. 2. In some aspects, the transmission component 1304 may be co-located with the reception component 1302 in one or more transceivers.

[0164] The communication manager 1306 may support operations of the reception component 1302 and/or the transmission component 1304. For example, the communication manager 1306 may receive information associated

with configuring reception of communications by the reception component **1302** and/or transmission of communications by the transmission component **1304**. Additionally, or alternatively, the communication manager **1306** may generate and/or provide control information to the reception component **1302** and/or the transmission component **1304** to control reception and/or transmission of communications.

[0165] The reception component **1302** may receive configuration information that includes one or more parameters for a system information block process. The transmission component **1304** may transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block. The reception component **1302** may receive the system information block in accordance with the configuration information and the uplink signal.

[0166] The reception component **1302** may receive, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier. The reception component **1302** may receive the system information block in accordance with the configuration information, the uplink signal, and the random access response. The transmission component **1304** may transmit, during a random-access process, a Message 3 that includes a radio resource control connection request. The reception component **1302** may receive the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request. The reception component **1302** may receive timing information that indicates a time duration during which the UE is to receive the system information block. The transmission component **1304** may transmit, during a random-access process, a Message 3 that includes a SSB measurement report. The transmission component **1304** may transmit a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system information block only and the second format indicates both a request for the system information block and a request for an RRC connection.

[0167] The number and arrangement of components shown in FIG. 13 are provided as an example. In practice, there may be additional components, fewer components, different components, or differently arranged components than those shown in FIG. 13. Furthermore, two or more components shown in FIG. 13 may be implemented within a single component, or a single component shown in FIG. 13 may be implemented as multiple, distributed components. Additionally, or alternatively, a set of (one or more) components shown in FIG. 13 may perform one or more functions described as being performed by another set of components shown in FIG. 13.

[0168] FIG. 14 is a diagram of an example apparatus **1400** for wireless communication, in accordance with the present disclosure. The apparatus **1400** may be a network node, or a network node may include the apparatus **1400**. In some aspects, the apparatus **1400** includes a reception component **1402**, a transmission component **1404**, and/or a communication manager **1406**, which may be in communication with one another (for example, via one or more buses and/or one or more other components). In some aspects, the communication manager **1406** is the communication manager **150** described in connection with FIG. 1. As shown, the apparatus **1400** may communicate with another apparatus **1408**,

such as a UE or a network node (such as a CU, a DU, an RU, or a base station), using the reception component **1402** and the transmission component **1404**.

[0169] In some aspects, the apparatus **1400** may be configured to perform one or more operations described herein in connection with FIGS. 6-10. Additionally, or alternatively, the apparatus **1400** may be configured to perform one or more processes described herein, such as process **1200** of FIG. 12. In some aspects, the apparatus **1400** and/or one or more components shown in FIG. 14 may include one or more components of the network node described in connection with FIG. 2. Additionally, or alternatively, one or more components shown in FIG. 14 may be implemented within one or more components described in connection with FIG. 2. Additionally, or alternatively, one or more components of the set of components may be implemented at least in part as software stored in one or more memories. For example, a component (or a portion of a component) may be implemented as instructions or code stored in a non-transitory computer-readable medium and executable by one or more controllers or one or more processors to perform the functions or operations of the component.

[0170] The reception component **1402** may receive communications, such as reference signals, control information, data communications, or a combination thereof, from the apparatus **1408**. The reception component **1402** may provide received communications to one or more other components of the apparatus **1400**. In some aspects, the reception component **1402** may perform signal processing on the received communications (such as filtering, amplification, demodulation, analog-to-digital conversion, demultiplexing, deinterleaving, de-mapping, equalization, interference cancellation, or decoding, among other examples), and may provide the processed signals to the one or more other components of the apparatus **1400**. In some aspects, the reception component **1402** may include one or more antennas, one or more modems, one or more demodulators, one or more MIMO detectors, one or more receive processors, one or more controllers/processors, one or more memories, or a combination thereof, of the network node described in connection with FIG. 2. In some aspects, the reception component **1402** and/or the transmission component **1404** may include or may be included in a network interface. The network interface may be configured to obtain and/or output signals for the apparatus **1400** via one or more communications links, such as a backhaul link, a midhaul link, and/or a fronthaul link.

[0171] The transmission component **1404** may transmit communications, such as reference signals, control information, data communications, or a combination thereof, to the apparatus **1408**. In some aspects, one or more other components of the apparatus **1400** may generate communications and may provide the generated communications to the transmission component **1404** for transmission to the apparatus **1408**. In some aspects, the transmission component **1404** may perform signal processing on the generated communications (such as filtering, amplification, modulation, digital-to-analog conversion, multiplexing, interleaving, mapping, or encoding, among other examples), and may transmit the processed signals to the apparatus **1408**. In some aspects, the transmission component **1404** may include one or more antennas, one or more modems, one or more modulators, one or more transmit MIMO processors, one or more transmit processors, one or more controllers/

processors, one or more memories, or a combination thereof, of the network node described in connection with FIG. 2. In some aspects, the transmission component 1404 may be co-located with the reception component 1402 in one or more transceivers.

[0172] The communication manager 1406 may support operations of the reception component 1402 and/or the transmission component 1404. For example, the communication manager 1406 may receive information associated with configuring reception of communications by the reception component 1402 and/or transmission of communications by the transmission component 1404. Additionally, or alternatively, the communication manager 1406 may generate and/or provide control information to the reception component 1402 and/or the transmission component 1404 to control reception and/or transmission of communications.

[0173] The reception component 1402 may receive an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process. The transmission component 1404 may transmit the system information block in accordance with the uplink signal.

[0174] The transmission component 1404 may transmit, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier. The transmission component 1404 may transmit the system information block in accordance with the configuration information, the uplink signal, and the random access response. The reception component 1402 may receive, during a random-access process, a Message 3 that includes a radio resource control connection request. The transmission component 1404 may transmit the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request. The transmission component 1404 may transmit timing information that indicates a time duration during which a UE is to receive the system information block. The reception component 1402 may receive, during a random-access process, a Message 3 that includes a SSB measurement report. The reception component 1402 may receive a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system information block only and the second format indicates both a request for the system information block and a request for an RRC connection.

[0175] The number and arrangement of components shown in FIG. 14 are provided as an example. In practice, there may be additional components, fewer components, different components, or differently arranged components than those shown in FIG. 14. Furthermore, two or more components shown in FIG. 14 may be implemented within a single component, or a single component shown in FIG. 14 may be implemented as multiple, distributed components. Additionally, or alternatively, a set of (one or more) components shown in FIG. 14 may perform one or more functions described as being performed by another set of components shown in FIG. 14.

[0176] The following provides an overview of some Aspects of the present disclosure:

[0177] Aspect 1: A method of wireless communication performed by a user equipment (UE), comprising: receiving configuration information that includes one or more parameters for a system information block process; transmitting, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and receiving the system information block in accordance with the configuration information and the uplink signal.

[0178] Aspect 2: The method of Aspect 1, wherein the system information block is an on-demand system information block 1 (OD-SIB1).

[0179] Aspect 3: The method of any of Aspects 1-2, wherein the message is a Message 1 or a Message 3, and wherein transmitting the uplink signal that includes the message comprises transmitting the uplink signal via an uplink channel that corresponds to a physical random access channel or a physical uplink shared channel.

[0180] Aspect 4: The method of any of Aspects 1-3, further comprising: receiving, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier; and receiving the system information block in accordance with the configuration information, the uplink signal, and the random access response.

[0181] Aspect 5: The method of any of Aspects 1-4, further comprising: transmitting, during a random-access process, a Message 3 that includes a radio resource control connection request; and receiving the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request.

[0182] Aspect 6: The method of Aspect 5, wherein the system information block is unicast to the UE via dedicated signaling.

[0183] Aspect 7: The method of any of Aspects 1-6, wherein the configuration information that includes the one or more parameters for system information block monitoring is included in a time-division duplexing uplink downlink configuration frame structure.

[0184] Aspect 8: The method of Aspect 7, wherein the configuration information includes one or more synchronization signal block (SSB) parameters, one or more uplink bandwidth part (BWP) parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, and one or more random access channel (RACH) parameters.

[0185] Aspect 9: The method of Aspect 8, wherein the one or more SSB parameters include an SSB positions in burst parameter, a synchronization signal (SS) physical broadcast channel (PBCH) block power parameter, a reference signal received power (RSRP) threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a sub-carrier spacing (SCS) parameter, wherein one or more of the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional

spectrum emission parameter, and wherein the one or more RACH parameters include a physical random access channel (PRACH) configuration index parameter, a Message 1 frequency-division multiplexing (FDM) parameter, a Message 1 frequency start parameter, an SSB-per-RACH occasion parameter, a random access SSB occasion mask index parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a random access preamble index parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, and a random access response window parameter.

[0186] Aspect 10: The method of Aspect 7, wherein the configuration information includes one or more synchronization signal block (SSB) parameters, one or more uplink bandwidth part (BWP) parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, one or more random access channel (RACH) parameters, one or more physical downlink control channel (PDCCH) parameters, one or more physical downlink shared channel (PDSCH) parameters, and one or more physical uplink shared channel (PUSCH) parameters.

[0187] Aspect 11: The method of Aspect 10, wherein the one or more SSB parameters include an SSB positions in burst parameter, a synchronization signal (SS) physical broadcast channel (PBCH) block power parameter, a reference signal received power (RSRP) threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a sub-carrier spacing (SCS) parameter, wherein one or more of the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, wherein the one or more RACH parameters include a physical random access channel (PRACH) configuration index parameter, a Message 1 frequency-division multiplexing (FDM) parameter, a Message 1 frequency start parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, a random access response window parameter, a total number of random access preambles parameter, an SSB-per-RACH-occasion-and-codebook-preambles-per-SSB parameter, a random access contention resolution timer parameter, and a Message 3 transform precoder parameter, wherein the one or more PDCCH parameters include a control resource set zero parameter, a search space system information block 1 parameter, and a random access search space parameter, wherein the one or more PDSCH parameters include a PDSCH time domain allocation list parameter, and wherein the one or more PUSCH parameters include a PUSCH time domain allocation list parameter, a group hopping enables transform precoding parameter, and a Message 3 delta preamble parameter.

[0188] Aspect 12: The method of any of Aspects 1-11, further comprising receiving timing information that indicates a time duration during which the UE is to receive the system information block.

[0189] Aspect 13: The method of Aspect 12, wherein the time duration is indicated in accordance with a quantity of system information block physical downlink control channel (PDCCH) monitoring occasions or in accordance with a time duration.

[0190] Aspect 14: The method of Aspect 13, wherein the UE configured to monitor for a system information block PDCCH transmission in a subset of system information block PDCCH monitoring occasions of the quantity of system information block PDCCH monitoring occasions.

[0191] Aspect 15: The method of any of Aspects 1-14, further comprising transmitting, during a random-access process, a Message 3 that includes a synchronization signal block (SSB) measurement report.

[0192] Aspect 16: The method of any of Aspects 1-15, further comprising transmitting a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system information block only and the second format indicates both a request for the system information block and a request for an RRC connection.

[0193] Aspect 17: A method of wireless communication performed by a network node, comprising: receiving an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and transmitting the system information block in accordance with the uplink signal.

[0194] Aspect 18: The method of Aspect 17, wherein the system information block is an on-demand system information block 1 (OD-SIB1).

[0195] Aspect 19: The method of any of Aspects 17-18, wherein the message is a Message 1 or a Message 3, and wherein receiving the uplink signal that includes the message comprises receiving the uplink signal via an uplink channel that corresponds to a physical random access channel or a physical uplink shared channel.

[0196] Aspect 20: The method of any of Aspects 17-19, further comprising: transmitting, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier; and transmitting the system information block in accordance with the configuration information, the uplink signal, and the random access response.

[0197] Aspect 21: The method of any of Aspects 17-20, further comprising: receiving, during a random-access process, a Message 3 that includes a radio resource control connection request; and transmitting the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request.

[0198] Aspect 22: The method of Aspect 21, wherein the system information block is unicast via dedicated signaling.

[0199] Aspect 23: The method of any of Aspects 17-22, wherein the configuration information that includes the one or more parameters for system information block monitoring is included in a time-division duplexing uplink downlink configuration frame structure.

[0200] Aspect 24: The method of Aspect 23, wherein the configuration information includes one or more synchronization signal block (SSB) parameters, one or more uplink bandwidth part (BWP) parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, and one or more random access channel (RACH) parameters.

[0201] Aspect 25: The method of Aspect 24, wherein the one or more SSB parameters include an SSB positions in burst parameter, a synchronization signal (SS) physical broadcast channel (PBCH) block power parameter, a reference signal received power (RSRP) threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a sub-carrier spacing (SCS) parameter, wherein one or more the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, and wherein the one or more RACH parameters include a physical random access channel (PRACH) configuration index parameter, a Message 1 frequency-division multiplexing (FDM) parameter, a Message 1 frequency start parameter, an SSB-per-RACH occasion parameter, a random access SSB occasion mask index parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a random access preamble index parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, and a random access response window parameter.

[0202] Aspect 26: The method of Aspect 23, wherein the configuration information includes one or more synchronization signal block (SSB) parameters, one or more uplink bandwidth part (BWP) parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, one or more random access channel (RACH) parameters, one or more physical downlink control channel (PDCCH) parameters, one or more physical downlink shared channel (PDSCH) parameters, and one or more physical uplink shared channel (PUSCH) parameters.

[0203] Aspect 27: The method of Aspect 26, wherein the one or more SSB parameters include an SSB positions in burst parameter, a synchronization signal (SS) physical broadcast channel (PBCH) block power parameter, a reference signal received power (RSRP) threshold SSB measurement timing configuration parameter, and an offset to Point A parameter, wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a sub-carrier spacing (SCS) parameter, wherein one or more the downlink frequency information parameters include a frequency band parameter, wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, wherein the one or more RACH parameters include a physical random access channel (PRACH) configuration index parameter, a Message 1 frequency-division multiplexing (FDM) parameter, a

Message 1 frequency start parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, a random access response window parameter, a total number of random access preambles parameter, an SSB-per-RACH-occasion-and-codebook-preambles-per-SSB parameter, a random access contention resolution timer parameter, and a Message 3 transform precoder parameter, wherein the one or more PDCCH parameters include a control resource set zero parameter, a search space system information block 1 parameter, and a random access search space parameter, wherein the one or more PDSCH parameters include a PDSCH time domain allocation list parameter, and wherein the one or more PUSCH parameters include a PUSCH time domain allocation list parameter, a group hopping enables transform precoding parameter, and a Message 3 delta preamble parameter.

[0204] Aspect 28: The method of any of Aspects 17-27, further comprising transmitting timing information that indicates a time duration during which a user equipment (UE) is to receive the system information block.

[0205] Aspect 29: The method of Aspect 28, wherein the time duration is indicated in accordance with a quantity of system information block physical downlink control channel (PDCCH) monitoring occasions or in accordance with a time duration.

[0206] Aspect 30: The method of any of Aspects 17-29, further comprising receiving, during a random-access process, a Message 3 that includes a synchronization signal block (SSB) measurement report.

[0207] Aspect 31: The method of any of Aspects 17-30, further comprising receiving a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system information block only and the second format indicates both a request for the system information block and a request for an RRC connection.

[0208] Aspect 32: An apparatus for wireless communication at a device, the apparatus comprising one or more processors; one or more memories coupled with the one or more processors; and instructions stored in the one or more memories and executable by the one or more processors to cause the apparatus to perform the method of one or more of Aspects 1-31.

[0209] Aspect 33: An apparatus for wireless communication at a device, the apparatus comprising one or more memories and one or more processors coupled to the one or more memories, the one or more processors configured to cause the device to perform the method of one or more of Aspects 1-31.

[0210] Aspect 34: An apparatus for wireless communication, the apparatus comprising at least one means for performing the method of one or more of Aspects 1-31.

[0211] Aspect 35: A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by one or more processors to perform the method of one or more of Aspects 1-31.

[0212] Aspect 36: A non-transitory computer-readable medium storing a set of instructions for wireless communication, the set of instructions comprising one or more instructions that, when executed by one or more processors of a device, cause the device to perform the method of one or more of Aspects 1-31.

[0213] Aspect 37: A device for wireless communication, the device comprising a processing system that includes one or more processors and one or more memories coupled with the one or more processors, the processing system configured to cause the device to perform the method of one or more of Aspects 1-31.

[0214] Aspect 38: An apparatus for wireless communication at a device, the apparatus comprising one or more memories and one or more processors coupled to the one or more memories, the one or more processors individually or collectively configured to cause the device to perform the method of one or more of Aspects 1-31.

[0215] The foregoing disclosure provides illustration and description but is not intended to be exhaustive or to limit the aspects to the precise forms disclosed. Modifications and variations may be made in light of the above disclosure or may be acquired from practice of the aspects.

[0216] As used herein, the term “component” is intended to be broadly construed as hardware or a combination of hardware and at least one of software or firmware. “Software” shall be construed broadly to mean instructions, instruction sets, code, code segments, program code, programs, subprograms, software modules, applications, software applications, software packages, routines, subroutines, objects, executables, threads of execution, procedures, or functions, among other examples, whether referred to as software, firmware, middleware, microcode, hardware description language, or otherwise. As used herein, a “processor” is implemented in hardware or a combination of hardware and software. It will be apparent that systems or methods described herein may be implemented in different forms of hardware or a combination of hardware and software. The actual specialized control hardware or software code used to implement these systems or methods is not limiting of the aspects. Thus, the operation and behavior of the systems or methods are described herein without reference to specific software code, because those skilled in the art will understand that software and hardware can be designed to implement the systems or methods based, at least in part, on the description herein. A component being configured to perform a function means that the component has a capability to perform the function, and does not require the function to be actually performed by the component, unless noted otherwise.

[0217] As used herein, “satisfying a threshold” may, depending on the context, refer to a value being greater than the threshold, greater than or equal to the threshold, less than the threshold, less than or equal to the threshold, equal to the threshold, or not equal to the threshold, among other examples.

[0218] As used herein, a phrase referring to “at least one of” a list of items refers to any combination of those items, including single members. As an example, “at least one of: a, b, or c” is intended to cover a, b, c, a+b, a+c, b+c, and a+b+c, as well as any combination with multiples of the same element (for example, a+a, a+a+a, a+a+b, a+a+c, a+b+b, a+c+c, b+b, b+b+b, b+b+c, c+c, and c+c+c, or any other ordering of a, b, and c).

[0219] No element, act, or instruction used herein should be construed as critical or essential unless explicitly described as such. Also, as used herein, the articles “a” and “an” are intended to include one or more items and may be used interchangeably with “one or more.” Further, as used herein, the article “the” is intended to include one or more items referenced in connection with the article “the” and may be used interchangeably with “the one or more.” Furthermore, as used herein, the terms “set” and “group” are intended to include one or more items and may be used interchangeably with “one or more.” Where only one item is intended, the phrase “only one” or similar language is used. Also, as used herein, the terms “has,” “have,” “having,” and similar terms are intended to be open-ended terms that do not limit an element that they modify (for example, an element “having” A may also have B). Further, the phrase “based on” is intended to mean “based on or otherwise in association with” unless explicitly stated otherwise. Also, as used herein, the term “or” is intended to be inclusive when used in a series and may be used interchangeably with “and/or,” unless explicitly stated otherwise (for example, if used in combination with “either” or “only one of”). It should be understood that “one or more” is equivalent to “at least one.”

[0220] Even though particular combinations of features are recited in the claims or disclosed in the specification, these combinations are not intended to limit the disclosure of various aspects. Many of these features may be combined in ways not specifically recited in the claims or disclosed in the specification. The disclosure of various aspects includes each dependent claim in combination with every other claim in the claim set.

What is claimed is:

1. An apparatus for wireless communication at a user equipment (UE), comprising:

one or more memories; and

one or more processors, coupled to the one or more memories, which are configured, individually or in any combination, to cause the UE to:

receive configuration information that includes one or more parameters for a system information block process;

transmit, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and

receive the system information block in accordance with the configuration information and the uplink signal.

2. The apparatus of claim 1, wherein the system information block is an on-demand system information block 1 (OD-SIB1).

3. The apparatus of claim 1, wherein the message is a Message 1 or a Message 3, and wherein the one or more processors, to cause the UE transmit the uplink signal that includes the message, are configured to cause the UE to transmit the uplink signal via an uplink channel that corresponds to a physical random access channel or a physical uplink shared channel.

4. The apparatus of claim 1, wherein the one or more processors are further configured to cause the UE to:

receive, during a random-access process, a random access response associated with a Message 2 of the random-access process that includes a random access preamble identifier; and

receive the system information block in accordance with the configuration information, the uplink signal, and the random access response.

5. The apparatus of claim 1, wherein the one or more processors are further configured to cause the UE to:

transmit, during a random-access process, a Message 3 that includes a radio resource control connection request; and

receive the system information block in accordance with the configuration information, the uplink signal, and the radio resource control connection request.

6. The apparatus of claim 5, wherein the system information block is unicast to the UE via dedicated signaling.

7. The apparatus of claim 1, wherein the configuration information that includes the one or more parameters for system information block monitoring is included in a time-division duplexing uplink downlink configuration frame structure.

8. The apparatus of claim 7, wherein the configuration information includes one or more synchronization signal block (SSB) parameters, one or more uplink bandwidth part (BWP) parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters, one or more uplink frequency information parameters, and one or more random access channel (RACH) parameters.

9. The apparatus of claim 8, wherein the one or more SSB parameters include an SSB positions in burst parameter, a synchronization signal (SS) physical broadcast channel (PBCH) block power parameter, a reference signal received power (RSRP) threshold SSB measurement timing configuration parameter, and an offset to Point A parameter,

wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a sub-carrier spacing (SCS) parameter,

wherein one or more the downlink frequency information parameters include a frequency band parameter,

wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter, and

wherein the one or more RACH parameters include a physical random access channel (PRACH) configuration index parameter, a Message 1 frequency-division multiplexing (FDM) parameter, a Message 1 frequency start parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a random access preamble index parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, and a random access response window parameter.

10. The apparatus of claim 7, wherein the configuration information includes one or more synchronization signal block (SSB) parameters, one or more uplink bandwidth part (BWP) parameters, one or more downlink BWP parameters, one or more downlink frequency information parameters,

one or more uplink frequency information parameters, one or more random access channel (RACH) parameters, one or more physical downlink control channel (PDCCH) parameters, one or more physical downlink shared channel (PDSCH) parameters, and one or more physical uplink shared channel (PUSCH) parameters.

11. The apparatus of claim 10, wherein the one or more SSB parameters include an SSB positions in burst parameter, a synchronization signal (SS) physical broadcast channel (PBCH) block power parameter, a reference signal received power (RSRP) threshold SSB measurement timing configuration parameter, and an offset to Point A parameter,

wherein the one or more uplink BWP parameters or the one or more downlink BWP parameters include a location and bandwidth parameter and a sub-carrier spacing (SCS) parameter,

wherein one or more the downlink frequency information parameters include a frequency band parameter,

wherein the one or more uplink frequency information parameters include a frequency band parameter, an absolute frequency point A parameter p-Max, and an additional spectrum emission parameter,

wherein the one or more RACH parameters include a physical random access channel (PRACH) configuration index parameter, a Message 1 frequency-division multiplexing (FDM) parameter, a Message 1 frequency start parameter, a PRACH root sequence index parameter, a zero correlation zone configuration parameter, a restricted set configuration parameter, a Message 1 SCS parameter, a preamble received target power parameter, a preamble transition matrix parameter, a power ramping step parameter, a random access response window parameter, a total number of random access preambles parameter, an SSB-per-RACH-occasion-and-codebook-preambles-per-SSB parameter, a random access contention resolution timer parameter, and a Message 3 transform precoder parameter,

wherein the one or more PDCCH parameters include a control resource set zero parameter, a search space system information block 1 parameter, and a random access search space parameter,

wherein the one or more PDSCH parameters include a PDSCH time domain allocation list parameter, and

wherein the one or more PUSCH parameters include a PUSCH time domain allocation list parameter, a group hopping enables transform precoding parameter, and a Message 3 delta preamble parameter.

12. The apparatus of claim 1, wherein the one or more processors are further configured to cause the UE to receive timing information that indicates a time duration during which the UE is to receive the system information block.

13. The apparatus of claim 12, wherein the time duration is indicated in accordance with a quantity of system information block physical downlink control channel (PDCCH) monitoring occasions or in accordance with a time duration.

14. The apparatus of claim 13, wherein the UE configured to monitor for a system information block PDCCH transmission in a subset of system information block PDCCH monitoring occasions of the quantity of system information block PDCCH monitoring occasions.

15. The apparatus of claim 1, wherein the one or more processors are further configured to cause the UE to trans-

mit, during a random-access process, a Message 3 that includes a synchronization signal block (SSB) measurement report.

16. The apparatus of claim **1**, wherein the one or more processors are further configured to cause the UE to transmit a radio resource control (RRC) message having a first format or a second format, wherein the first format indicates a request for the system information block only and the second format indicates both a request for the system information block and a request for an RRC connection.

17. An apparatus for wireless communication at a network node, comprising:

one or more memories; and

one or more processors, coupled to the one or more memories, which are configured, individually or in any combination, to cause the network node to:

receive an uplink signal that includes a message, the message indicating a request for a system information block, wherein the uplink signal is in accordance with one or more parameters for a system information block process; and

transmit the system information block in accordance with the uplink signal.

18. The apparatus of claim **17**, wherein the system information block is an on-demand system information block 1 (OD-SIB1).

19. The apparatus of claim **17**, wherein the message is a Message 1 or a Message 3, and wherein the one or more processors, to cause the network node to receive the uplink signal that includes the message, are configured to cause the network node to receive the uplink signal via an uplink channel that corresponds to a physical random access channel or a physical uplink shared channel.

20. A method of wireless communication performed by a user equipment (UE), comprising:

receiving configuration information that includes one or more parameters for a system information block process;

transmitting, in accordance with the configuration information, an uplink signal that includes a message, the message indicating a request for a system information block; and

receiving the system information block in accordance with the configuration information and the uplink signal.

* * * * *