

**【Biographical data】**

|                                       |                                                                              |
|---------------------------------------|------------------------------------------------------------------------------|
| <b>【Document name】</b>                | Application for Patent                                                       |
| <b>【Applicant】</b>                    |                                                                              |
| <b>【Name】</b>                         | KT Corp                                                                      |
| <b>【Patent Customer No.】</b>          | 2-1998-005456-3                                                              |
| <b>【Agent】</b>                        |                                                                              |
| <b>【Name】</b>                         | YUIL HIGHEST INTERNATIONAL<br>PATENT & LAW FIRM                              |
| <b>【Agent No.】</b>                    | 9-2017-100261-6                                                              |
| <b>【Title of Invention (Korean)】</b>  | 네트워크 슬라이스 기반 데이터 처리 방법 및<br>그 장치                                             |
| <b>【Title of Invention (English)】</b> | Methods for processing a data based Network<br>Slice and Apparatuses thereof |
| <b>【Inventor】</b>                     |                                                                              |
| <b>【Name】</b>                         | 홍성표                                                                          |
| <b>【Name (English)】</b>               | Sung-pyo, HONG                                                               |
| <b>【Resident registration No.】</b>    | 720323-1XXXXXX                                                               |
| <b>【Zip code】</b>                     | 137-140                                                                      |
| <b>【Address】</b>                      | KT Research & development center,<br>17 Umyeon-dong, Socho-gu, Seoul         |
| <b>【Inventor】</b>                     |                                                                              |
| <b>【Name】</b>                         | 최우진                                                                          |
| <b>【Name (English)】</b>               | Wu-jin, CHOI                                                                 |
| <b>【Resident registration No.】</b>    | 660822-1XXXXXX                                                               |
| <b>【Zip code】</b>                     | 137-140                                                                      |
| <b>【Address】</b>                      | KT Research & development center,<br>17 Umyeon-dong, Socho-gu, Seoul         |
| <b>【Filing language】</b>              | Korean                                                                       |
| <b>【Priority claim】</b>               |                                                                              |
| <b>【Country】</b>                      | KR                                                                           |
| <b>【Priority Application No.】</b>     | 10-2016-0146054                                                              |

Date of submission: 2017-10-30

**【Filing date】** 2016. 11.03  
**【Proof document】** Attached  
**【Purpose】** We hereby submit the attached document to the  
attention of the Commissioner of  
the Korean Intellectual Property Office

Representative YUIL HIGHEST INTERNATIONAL  
PATENT & LAW FIRM (signature or seal)

**【Fees】**  
**【Filing fee】** 0 page 46.000 KR won  
**【Added fee】** 59 pages 0 KR won  
**【Priority claim fee】** 1 case 18.000 KR won  
**【Request for Examination fee】** 0 claim 0 KR won  
**【Total】** 64.000 KR won

**【Description of Invention】**

**【Title of Invention】**

Method for processing a data based network slice and apparatus thereof

**【Technical Field】**

**【0001】** The present disclosure relates to a technology for providing a network slice in a next generation mobile communication network, and, to a technology for providing services according to a movement of a user equipment (UE) using network slice-based services without interruption.

**【Background Art】**

**【0002】** Thanks to advances in communication systems, various types of wireless UEs are used by consumers such as companies and individuals.

**【0003】** The mobile communication systems employing technologies related to 3rd generation partnership project (3GPP), such as Long Term Evolution (LTE), LTE-Advanced, fifth generation (5G), etc., require high-speed and high-capacity communication system capable of transmitting and receiving various data such as video data, radio data, etc.

**【0004】** Meanwhile, after LTE-Advanced, technologies for next generation radio access networks have been developed for enabling transmission and reception of data with even more UEs and providing higher quality of service (QoS). For example, many developments related to so-called 5G network based on 3GPP are under way.

**【0005】** In particular, researches are in progress for developing a service-oriented next generation mobile communication network that employs network slicing technology in order to establish the high-speed, high-capacity communication system mentioned above, instead of the method of configuring core network and access network via physical network entities, thus improving the efficiency of utilizing network resources, effectively accommodating a mobile service with various requirements, and guaranteeing quality of an end-to-end service to the UEs.

**【0006】** Meanwhile, there is no discussion conducted for mobility guarantee of the UE and transmission/reception procedures of data in case the network slicing technology is employed, and it is necessary to develop a specific procedure for service continuity and service stability.

**【Summary of Invention】**

**【Technical Problem】**

**【0007】** Accordingly, to address such issues, the present disclosure proposes a specific procedure of a user equipment (UE) and a base station for providing network

slicing-based services, and a procedure for controlling the mobility of the UE using network slicing-based services.

**【Solution to Problem】**

**【0008】** In accordance with an embodiment of the present disclosure devised in order to address the issues mentioned above, a method of a base station for controlling data transmission and reception through a network slice is provided, which includes steps of: receiving network slice request information from a UE configured with the network slice; controlling so that the network slice request information is transferred to a core network entity; and receiving, from the core network entity, specific network slice information that is configured based on the network slice request information.

**【0009】** Further, in accordance with an embodiment, a method of a UE for controlling data transmission and reception through a network slice is provided, which includes steps of: configuring a network slice; transmitting network slice request information to a base station; and receiving, from the base station, a handover command generated based on specific network slice information received from a core network entity by a target base station.

**【0010】** Further, in accordance with an embodiment, a base station for controlling data transmission and reception through a network slice is provided, which includes: a receiver that receives network slice request information from a UE configured with the network slice; and a controller that controls so that the network slice request information is transferred to a core network entity, in which the receiver further receives specific network slice information that is configured based on the network slice request information from the core network entity.

**【0011】** Further, in accordance with an embodiment, a UE for controlling data transmission and reception through a network slice is provided, which includes: a controller that configures a network slice; a transmitter that transmits network slice request information to a base station; and a receiver that receives, from the base station, a handover command generated based on specific network slice information received from a core network entity by a target base station.

**【Effects of Invention】**

**【0012】** In accordance with the embodiments described above, there is an effect that the services are provided through network slicing with reduced service interruption.

**【0013】** Further, the embodiments provides an effect that the UE and the base station provide services through network slicing, thus enabling high-speed, high-capacity processing at the UE.

**【Brief Description of Drawings】**

**【0014】** FIG. 1 is a diagram provided to explain an example of a plurality of slices established in the same network infrastructure.

FIG. 2 is a diagram provided to explain operations of a base station according to one embodiment.

FIG. 3 is a diagram provided to explain operations of a base station according to another embodiment.

FIG. 4 is a diagram provided to explain operations of a UE according to yet another embodiment.

FIG. 5 is a diagram provided to explain a configuration of a base station according to yet another embodiment.

FIG. 6 is a diagram provided to explain a configuration of a UE according to yet another embodiment.

**【Detailed Description for Embodying Invention】**

**【0015】** Hereinafter, embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. In adding reference numerals to elements in each drawing, the same elements will be designated by the same reference numerals, if possible, although they are shown in different drawings. Further, in the following description of the present disclosure, a detailed description of known functions and configurations incorporated herein will be omitted when it is determined that the description may make the subject matter of the present disclosure rather unclear.

**【0016】** In the present disclosure, an MTC UE may refer to a UE supporting low cost (or low complexity), a UE supporting coverage enhancement, etc. The MTC UE as used herein may refer to a UE supporting low cost (or low complexity), a UE supporting coverage enhancement, etc. The MTC UE as used herein may refer to a UE classified into a certain category for supporting low cost (or low complexity) and/or coverage enhancement.

**【0017】** In other words, the MTC UE as used herein may refer to a newly defined in 3GPP Release-13 low cost (or low complexity) UE category/type that performs LTE-based MTC-related operations. Alternatively, the MTC UE may refer to a UE category/type defined in or before 3GPP Release-12, which supports enhanced coverage in comparison with the typical LTE coverage or supports low power consumption or, the MTC device may refer to a newly defined Release-13 low cost (or low complexity) UE category/type.

**【0018】** In the present disclosure, a wireless communication system is widely deployed to provide various communication services, such as a voice communication service, a packet data service, etc. The wireless communication system includes a user

equipment (UE) and a base station (BS, or eNB). In the present disclosure, the UE is defined as a generic term referring to UEs used in wireless communications, and should be interpreted as a generic concept including not only the user equipment (UE) in the wideband code division multiple access (WCDMA), long term evolution (LTE), high speed packet access (HSPA), etc., but also a mobile station (MS), a user UE (UT), a subscriber station (SS), a wireless device, etc. in the global system for mobile communication (GSM).

**【0019】** The base station or a cell generally refers to a station communicating with the UE, and may be interchangeably referred to as a Node-B, an evolved Node-B (eNB), a sector, a site, a base transceiver system (BTS), an access point, a relay node, a remote radio head (RRH), a radio unit (RU), a small cell, or others.

**【0020】** That is, the base station or the cell should be interpreted as a generic term that represents some areas or functions covered by a base station controller (BSC) in CDMA, a Node-B in the WCDMA, an evolved Node-B (eNB) or a sector (site) in the LTE, etc., and as a generic term that encompasses all of various coverage areas, such as a megacell, a macrocell, a microcell, a picocell, a femtocell and a relay node, RRH, RU, a small cell communication range, etc.

**【0021】** Each of the various cells listed above is controlled by a base station, and therefore, the base station may be classified into two categories. i) It may be an apparatus itself provides a megacell, a macrocell, a microcell, a picocell, a femtocell, or a small cell for a wireless service area; or ii) it may indicate the wireless service area itself. In the case of i), all apparatuses that are controlled by the same entity to provide a corresponding communication service area or that interact and cooperate with each other to form the wireless service area may be referred to as the base station. Depending on how the wireless service area is configured, an eNB, a RRH, an antenna, a RU, a low power node (LPN), a point, a transmission/reception point, a transmission point, a reception point, etc. may be referred to as an embodiment of the base station. In the case of ii), a wireless service area itself where UE or neighboring base station receive and transmit signals may be referred to as the base station.

**【0022】** Accordingly, the megacell, the macrocell, the microcell, the picocell, the femtocell, the small cell, the RRH, the antenna, the RU, the LPN, the point, the eNB, the transmission/reception point, the transmission point, or the reception point will be collectively referred to as the base station.

**【0023】** In the present disclosure, the UE and the base station are used as the generic terms that refer to entities for performing two forms of transmission/reception used to embody the technology and technical spirit described in the present specification, and are not limited to specific terms or words. The UE and the base station are used as the generic terms that refer to entities for performing two forms (i.e., uplink or downlink) of

transmission/reception used to embody the technology and technical spirit described in the present specification, and are not limited to specific terms or words. The uplink (“UL” or “uplink”) as used herein refers to a way of data transmission/reception by the UE to/from the base station, and the downlink (“DL” or “downlink”) refers to a way of data transmission/reception by the base station to/from the UE.

**【0024】** Any of multiple access techniques may be applied to the wireless communication system without limitation. Various multiple access techniques, such as code division multiple access (CDMA), time division multiple access (TDMA), frequency division multiple access (FDMA), orthogonal frequency division multiple access (OFDMA), OFDM-TDMA, OFDM-FDMA, OFDM-CDMA, etc. may be used. An embodiment of the present disclosure may be applied to resource allocation in asynchronous wireless communication evolving into LTE and LTE-advanced beyond GSM, WCDMA, and HSPA, and synchronous wireless communication evolving into CDMA, CDMA-2000, and UMB. The present disclosure is not construed to be limited to a particular wireless communication field and is construed as including all technical fields to which the spirit of the present disclosure may be applied.

**【0025】** UL transmission and DL transmission may be performed using a time division duplex (TDD) technique performing transmission using different times, or using a frequency division duplex (FDD) technique performing transmission through different frequencies.

**【0026】** Further, in some systems such as the LTE system or the LTE-advanced system, the UL and the DL are configured based on a single carrier or a pair of carriers under the standard. The UL and the DL may transmit control information through a control channel, such as a physical downlink control channel (PDCCH), a physical control format indicator channel (PCFICH), a physical hybrid ARQ indicator channel (PITCH), a physical uplink control channel (PUCCH), an enhanced physical downlink control channel (EPDCCH), etc., and may be configured with data channel, such as a physical downlink shared channel (PDSCH), a physical uplink shared channel (PUSCH), etc. to transmit data.

**【0027】** Meanwhile, the control information may also be transmitted through the EPDCCH (enhanced PDCCH or extended PDCCH).

**【0028】** In the present disclosure, the cell may refer to a coverage of a signal transmitted from a transmission point or a transmission/reception point, a component carrier having the coverage of the signal transmitted from the transmission/reception point, or the transmission/reception point itself.

**【0029】** A wireless communication system to which the embodiments are applied may be a coordinated multi-point transmission/reception system (CoMP system) in which

two or more transmission/reception points cooperate to transmit a signal, or a coordinated multi-antenna transmission system, or a coordinated multi-cell communication system. The CoMP system may include at least two multiple transmission/reception points and UEs.

**【0030】** The multiple transmission/reception points may be a base station or macrocell (hereinafter, referred to as ‘eNB’) and at least one remote radio head (RRH) that is connected to the eNB through an optical cable or an optical fiber and thereby controlled in a wired manner, and that has high transmission power or low transmission power in the macrocell area.

**【0031】** Hereinafter, “downlink (DL)” denotes communication or a communication path from multiple transmission/reception points to a UE, and “uplink (UL)” denotes communication or a communication path from the UE to the multiple transmission/reception points. In the DL, a transmitter may be a part of multiple transmission/reception points and a receiver may be a part of the UE. In the UL, a transmitter may be a part of the UE and a receiver may be a part of multiple transmission/reception points.

**【0032】** Hereinafter, when a signal is transmitted/received through a channel such as PUCCH, PUSCH, PDCCH, EPDCCH, and PDSCH, it may be described as the “PUCCH, the PUSCH, the PDCCH, the EPDCCH, and the PDSCH is transmitted/received”.

**【0033】** In addition, hereinafter, by describing that a “PDCCH is transmitted or received”, or that a “signal is transmitted or received through the PDCCH”, it may refer to transmitting or receiving an EPDCCH or transmitting or receiving a signal through the EPDCCH.

**【0034】** That is, a physical DL control channel described below may refer to the PDCCH or the EPDCCH, or is also used as meaning both the PDCCH and the EPDCCH.

**【0035】** Also, for convenience of description, an EPDCCH may be applied to an embodiment described with the PDCCH, and the PDCCH may be also applied to an embodiment described with the EPDCCH.

**【0036】** Meanwhile, “high layer signaling” described below includes radio resource control (RRC) signaling transmitting RRC information containing an RRC parameter.

**【0037】** The eNB performs DL transmission to UEs. The eNB may transmit a physical DL shared channel (PDSCH) which is a primary physical channel for unicast transmission, and a physical DL control channel (PDCCH) for transmitting DL control information such as scheduling required to receive the PDSCH and scheduling approval information for transmission through an UL data channel (for example, a physical UL

shared channel (PUSCH)). Hereinafter, transmitting/receiving a signal through each channel may be described in such a manner that a corresponding channel is transmitted/received.

**【0038】** Any of multiple access techniques may be applied to the wireless communication system without limitation. Various multiple access techniques, such as time division multiple access (TDMA), frequency division multiple access (FDMA), code division multiple access (CDMA), orthogonal frequency division multiple access (OFDMA), non-orthogonal multiple access (NOMA), OFDM-TDMA, OFDM-FDMA, OFDM-CDMA, etc. may be used. The NOMA includes sparse code multiple access (SCMA), low cost spreading (LDS), etc.

**【0039】** Embodiments of the present disclosure may be applied to resource allocation in asynchronous wireless communication evolving into LTE/LTE-advanced and IMT-2020 from GSM, WCDMA, and HSPA, synchronous wireless communication evolving into CDMA, CDMA-2000, and UMB. In the present disclosure, a machine type communication (MTC) UE may refer to a UE supporting low costs (or low complexity), a UE supporting coverage enhancement, etc. Alternatively, the MTC UE may refer to a UE defined as a certain category for supporting low cost (or low complexity) and/or coverage enhancement. In other words, the MTC UE may refer to a newly defined 3GPP Release-13 low cost (or low complexity) UE category/type that performs LTE-based MTC-related operations. Alternatively, the MTC UE may refer to a UE category/type defined in or before 3GPP Release-12, which supports enhanced coverage in comparison with the typical LTE coverage or supports low power consumption or, the MTC device may refer to a newly defined Release-13 low cost (or low complexity) UE category/type. Alternatively, the MTC device may refer to a further enhanced MTC UE defined in Release-14.

**【0040】** In the present disclosure, a Narrowband Internet of Things (NB-IoT) UE refers to a UE supporting radio access for cellular IoT. The objectives of NB-IoT technology include improved indoor coverage, supports for large-scale low-speed UEs, lower latency sensitivity, ultra-low UE costs, minimized power consumption, and optimized network architecture.

**【0041】** An enhanced mobile broadband (eMBB), massive machine-type communication (mMTC), and ultra-reliable and low latency communication (URLLC) are proposed as representative usage scenarios for NR having been discussed in the 3GPP recently. In the present disclosure, a frequency, a frame, a subframe, a resource, a resource block (RB), a region, a band, a sub-band, a control channel, a data channel, a synchronization signal, various reference signals, various signals, and various messages, associated with NR may be interpreted as meanings that were used in the past or are used in the present or as various meanings that will be used in the future.

**【0042】** Embodiments described below may be applied to UEs, base stations, and core network entities (e.g., MME, AMF, etc.), using next generation mobile communication (5G mobile communication, New-RAT, NR). For convenience of description, the base station may denote a base station (a central unit (CU), a distributed unit (DU), or an entity in which the CU and the DU are implemented as one logical entity) or a gNB, in a 5G radio network in which the central unit and the distributed unit are separated from each other.

**【0043】** In addition, the central unit and the distributed unit described herein may refer to a central unit and a distributed unit included in one base station, and one or more distributed units may be connected to one central unit. Thus, the distributed unit described below may refer to a specific distributed unit of a set of one or more distributed units connected to the central unit. In addition, a service described herein may refer to the overall of a network service configured by utilizing resources of a network in which a user equipment is connected to the network through a base station. Such a service may be provided through an end-to-end network slice described below.

**【0044】** Typical mobile communication networks, such as 4G mobile communication network (e.g., LTE), include a core network and an access network linked through physical network entities. As a result, the efficiency of utilizing network resources is reduced, and it is not easy to change configurations of the communication network. Recently, discussions have been conducted on a service-oriented next generation mobile communication network employing a network slicing technology for effectively accommodating a mobile service with various requirements, and guaranteeing quality of an end-to-end service to even UEs.

**【0045】** The network slicing is a technology for improving flexibility by dividing a network into multiple types of virtual networks using network virtualization technologies and configuring a separate logical network for each service or subscriber. With network slicing, a needed resource may be allocated from a virtualized network resource pool according to a service type, and therefore, when a new service is introduced, it is possible to provide the service rapidly without a physical network established, and to use efficiently limited physical network resources. Thus, the network slicing enables a logical network to be implemented in an infrastructure shared among multiple network slices, compared with establishing an independent network slicing infrastructure.

**【0046】** FIG. 1 is a diagram provided to explain an example of a plurality of slices established in the same network infrastructure.

**【0047】** Referring to FIG. 1, a service for connecting a notebook to the Internet through existing mobile broadband (MBB), a data service of watt-hour meter using machine type communications (MTC), a service for a video camera mounted on a police

helmet and a notebook located on a police car, a data service of an MTC sensor, etc., may be individually serviced through a plurality of slices in the same network infrastructure. Thus, network resource utilization, etc. may be improved by slicing and providing the network resource for each individual service.

**【0048】** The network slicing allows differentiated treatment depending on each customer requirements. With slicing, it is possible for operators to consider customers as belonging to different tenant types with each having different service requirements. (The network slicing allows differentiated treatment depending on each customer requirements. With slicing, it is now possible for mobile network operators (MNO) to consider customers as belonging to different tenant types with each having different service requirements that govern in terms of what slice types each tenant is eligible to use based on service level agreement (SLA) and subscriptions.)

**【0049】** A specific procedure is needed for a UE to transmit and receive data through a specific network slice or one or more network slices provided over a shared infrastructure. However, such a specific procedure has not been provided yet. In particular, the mobility is essentially required for mobile communication UE. It is necessary to develop a specific method for transmitting and receiving data without service interruption through the specific network slice or one or more network slices described above, but such a specific method has not been provided yet. Accordingly, it is impossible to guarantee the service continuity when a cell change is required as the UE moves.

**【0050】** The present disclosure has been proposed to address these issues, and accordingly, provides a method and apparatus for transmitting and receiving data based on network slicing in a mobile communication network. In addition, the present disclosure provides a method and apparatus for transmitting and receiving data based on network slicing while minimizing service interruption according to a movement of a UE between cells.

**【0051】** Hereinafter, specific methods according to embodiments of the present disclosure are discussed in detail. Methods described below may be used individually or in any combination.

**【0052】** A cell in the LTE is defined as “combination of downlink and optionally uplink resources”. A cell in the LTE relates to procedures including: synchronization (Synchronization depends on PSS/SSS and allows the UE to acquire the encoded PCI and the frame timing for reception of all DL transmissions and for all uplink transmissions (in addition to the uplink timing advance, for uplink transmissions). In this sense, all downlink transmissions which are time aligned with PSS/SSS and all uplink transmissions using the PSS/SSS as timing reference belong to a cell.); cell interference suppression (In order to suppress interference from neighbor cells, all downlink transmissions are scrambled with

(for physical channels) or determined by (for reference signals) a specific sequence. For most downlink transmissions, the corresponding sequence is associated to the PCI, which value is determined from the sequence visible from PSS/SSS. Using different PCI values for neighbor cells allows different downlink transmissions to use different sequences.); system information (After synchronization to the network, the UE acquires the cell reference symbols (CRS) which allows decoding the PBCH carrying the MIB. According to the MIB, the UE knows the cell bandwidth, PHICH and SFN. After acquiring the MIB and the PCFICH, the UE knows exactly the location of control channel, i.e., PDCCH and can acquire system information. From L3 perspective, system information is a set of parameters associated to each other as part of “a cell”. All these signals and channels are using a sequence determined by the value of the PCI, which is the same for all); data transmission (Data transmission in LTE is controlled by information transmitted on PDCCH. The UE is allocated at least a C-RNTI, which is implicitly encoded in control indications (either DL, DCI, or UL, UCI) via a CRC calculation. As for data, they are scrambled using a sequence determined by the PCI but also by the UE RNTI also providing some randomization of transmissions across multiple UEs, which can be useful e.g. in case of spatial multiplexing.); measurement and handover (When the UE is in RRC\_CONNECTED, the UE is configured with downlink measurement gap and measurement events in order to prepare handover as the UE is moving. The measurement process includes synchronization and reading of CRS and PCI is used to identify different cells.)

**【0053】** It is also necessary define a cell in a new radio technology network (or a 5G network) (hereinafter, referred to as NR for convenience of description). For example, one NR cell in the NR may be associated with one or more of procedures described below.

**【0054】** - DL synchronization signals deriving identical NR cell ID;

**【0055】** - identical system information distribution for at least minimum SI;

**【0056】** - efficient use of all possible types of multi-TRP operation;

**【0057】** - downlink/uplink physical channels/signals towards a connected UE are identical/valid in more than one TRP.

**【0058】** An NR cell may have one or more of a single set of system information, barring and same tracking area. In the case that a single NR cell consists of more than one TRP, then all the TRPs transmit the same system information. (An NR cell may have one or more of a single set of system information, barring and same tracking area. In the case that a single NR cell consists of more than one TRP, then all the TRPs transmit the same system information.)

**【0059】** The NR cell may be flexibly associated with slice information. For example, an NR cell may support a dedicated slice information or multiple different slice

information. NR cells may support slice information different from those of neighbor NR cells. In this example, the slice information may represent a slice type, a tenant type, a slice identity (ID), a tenant ID, multi-dimensional descriptor (MDD) information, a slice service, slice service information, slice configuration information, slice characteristic information, an RAN function (any NR functions, any E-UTRAN functions) of a corresponding slice, or information for differentiating/identifying/describing an RAN function list of a corresponding slice. For convenience of description, this will be referred to as “slice information”. This is only for convenience of description, and thus, it should be considered that any information for differentiating/identifying/describing a specific network slice in the NR is included in the scope of the present disclosure. For example, information for identifying a network slice may be described as the slice information.

**【0060】** The slice information for identifying a network slice may include information on a slice service type and a slice differentiator. The slice differentiator includes information representing a difference between identical slice service types. For example, the enhanced mobile broadband (eMBB) service may be designated as one slice service type. As another example, the ultra-reliable low latency communication (URLLC) service may be designated as one slice service type. As yet another example, the IoT service may be designated as one slice service type. As yet another example, a slice differentiator may be designated for supporting a voice service in the eMBB slice service type. As yet another example, a slice differentiator may be designated for supporting an image service in the eMBB slice service type.

**【0061】** For enabling a UE (hereinafter, for convenience of description, referred to as a UE configured with a specific slice) having one specific slice information or one or more specific slice information (or associated with this or configured with this) to access NR cell/network (hereinafter, for convenience of description, referred to as a cell/network configured with a slice) having corresponding slice information, the network configured with the related slices may provide related support information.

**【0062】** For example, an NR cell may provide slice information to a UE. For example, the slice information may be broadcast through system information. As another example, the slice information may be indicated to a UE through RRC dedicated signaling. Through this information, the UE may select an NR cell providing a configured slice (or a slice to which the UE belongs, with which the UE is associated, or to which the UE is subscribed).

**【0063】** For another example, the NR cell may provide slice information of the neighbor cell to a UE. For example, the slice information of the neighbor cell may be broadcast through system information. As another example, the slice information of the neighbor cell may be indicated to the UE through RRC dedicated signaling. Through this

information, the UE may select/reselect an NR cell providing a configured slice (or a slice to which the UE belongs, with which the UE is associated, or to which the UE is subscribed).

**【0064】** Meanwhile, when the UE configured with a specific slice moves between cells (or moves between base stations, or moves to another base station cell), technologies for supporting the service continuity may be provided to reduce service interruption. The following is an example of possible service scenario.

**【0065】 Scenario 1: Moving from a Cell Supporting Network Slicing to a Cell not Supporting the Network Slicing**

**【0066】** While a UE is located in a source cell (or a current cell or a camped cell), the UE may recognize whether a neighbor cell to which the UE is intended to move supports/allows a specific network slice based on on-demand system information associated with network slicing related system information or network slicing related minimum system information of the neighbor cell, or indication information over RRC dedicated signaling (e.g., an RRC release message) for identifying whether the neighbor cell supports the network slicing.

**【0067】** If the neighbor cell the UE intends to move to does not support/allow the specific network slice, while the UE transmits and receives data through network slicing in the source cell, the UE may request a network slicing service to an application server for supporting the specific network slice through unicast, or reselect a cell supporting/allowing the specific network slice, or perform a cell reselection by giving the cell not supporting/allowing the specific network slice a lower priority. To this end, the NR cell may give different cell reselection priority according to whether the neighbor cell supports/allows the specific network slice, and then indicate this to the UE. The UE may perform cell reselection by giving a priority to a cell supporting/allowing the specific network slice configured for the UE. If there are one or more network slices configured, the UE may perform the cell reselection based on a cell reselection priority of a network slice with high priority according to network slice priority information configured/allowed/indicated by a core network entity.

**【0068】 Scenario 2: Moving from a Cell Supporting/Allowing Network Slicing to a Cell Supporting/Allowing Network Slicing**

**【0069】** While a UE is located in a source cell (or a current cell or a camped cell), the UE may recognize whether a neighbor cell to which the UE is intended to move supports/allows a specific network slice based on on-demand system information associated with network slicing related system information or network slicing related minimum system information of a neighbor cell, or indication information over RRC dedicated

signaling (e.g., an RRC release message) for identifying whether the neighbor cell supports the network slicing. To this end, the NR cell may give different cell reselection priority according to whether the neighbor cell supports/allows the specific network slice, and then indicate this to the UE. Through this, the UE may perform cell reselection by giving a priority to a cell supporting/allowing the specific network slice.

**【0070】** Hereinafter, operations of configuring a network slice at a UE and a base station and controlling mobility of the UE will be described with reference to the accompanying drawings. It is to be noted that the operations of the base station and the UE described below are related to one embodiment and that the base station and the UE may also perform operations of the other embodiments.

**【0071】** FIG. 2 is a diagram provided to explain operations of a base station according to one embodiment.

**【0072】** Referring to FIG. 2, the base station may perform a step of receiving network slice request information from a UE configured with a network slice, at S210. For example, the UE may be configured with one or more network slices through network slice information received through broadcast system information or an RRC reconfiguration message. Alternatively, the UE may be configured with one or more network slices using pre-configured network slice information. One network slice may be configured to be associated with one protocol data unit (PDU) session.

**【0073】** The network slice request information the base station receives from the UE may be included in a radio resource control (RRC) connection setup message. Alternatively, the network slice request information may be included in a non-access stratum (NAS) message included in the RRC connection setup message.

**【0074】** In addition, the network slice request information may include specific network slice information configured for the UE. For example, the network slice request information may include information on at least one of network slice configured for the UE, information for identifying a network slice service/PDU session/bearer associated with the corresponding network slice information, and information on a priority of the corresponding network slice. In this example, the “network slice information associated with the UE” refers to information on a network slice configured for the UE by a network or to slice information allowed by the network based on subscription information.

**【0075】** The base station may perform a step of controlling so that the network slice request information is transferred to a core network entity, at S220. For example, when the base station receives the network slice request information from the UE, the base station may control so that the received network slice request information is transferred to the core network entity. This is for authorization, identification and confirmation/

acknowledgment by the UE on network slice information included in the corresponding network slice request information, and to this end, the base station transmits the network slice request information to the core network entity.

**【0076】** The base station may receive specific network slice information that is configured based on the network slice request information from the core network entity, at S230. After the base station has transmitted the network slice request information to the core network entity, the base station may receive, from the core network entity, the specific network slice information that is configured based on the network slice request information. For example, the specific network slice information is identified by the core network entity based on the network slice request information and the subscription information and may be included in UE context information and received.

**【0077】** The core network entity receiving the network slice request information may verify the validity as to whether the UE has an access to the corresponding network slice. As another example, the core network entity may transmit, to the base station, UE context information including specific configured network slice information according to a value that is included in subscriber information etc. through a subscriber information server. For example, the UE context information transmitted by the core network entity may include network slice related information or configured network slice information. In this example, the network slice related information may include at least one of information for identifying a service/PDU session/bearer associated with corresponding network slice information, and bearer information of a PDU session associated with the network slice.

**【0078】** Through these processes, the core network entity may control a service through the network slice of the UE, and control data transmission and reception through the network slice.

**【0079】** FIG. 3 is a diagram provided to explain operations of the base station according to another embodiment.

**【0080】** Referring to FIG. 3, the base station may perform the steps of: receiving network slice request information from the UE configured with the network slice (S210); controlling so that the network slice request information is transferred to be a core network entity (S220); receiving specific network slice information that is configured based on the network slice request information from the core network entity (S230); and transmitting the specific network slice information to a target base station (S340).

**【0081】** In this example, the steps S210 to S230 may be performed in identical or similar manner to the embodiments described above with reference to FIG. 2.

**【0082】** After the base station has received the specific network slice information from the core network entity, the base station may transmit the specific network slice

information to the target base station. For example, the base station may transmit the specific network slice information to the target base station through the core network entity. As another example, the base station may transmit the specific network slice information to the target base station through an interface with the target base station.

**【0083】** When the target base station receives the specific network slice information, the target base station may generate a handover command for the UE based on at least one of the specific network slice information and network slice information allowed by the target base station. The handover command may be transferred by the target base station to the base station and transmitted to the UE. That is, the UE receives the handover command from the source base station.

**【0084】** FIG. 4 is a diagram provided to explain operations of the UE according to yet another embodiment.

**【0085】** Referring to FIG. 4, the UE may perform a step of configuring the network slice (S410). For example, the UE may be configured with one or more network slices through network slice information received through broadcast system information or an RRC reconfiguration message. Alternatively, the UE may be configured with one or more network slices using pre-configured network slice information. One network slice may be configured to be associated the connection one protocol data unit (PDU) session. Accordingly, the UE may be configured with one or more network slices.

**【0086】** The UE may perform a step of transmitting the network slice request information to the base station (S420). The network slice request information may be included in a radio resource control (RRC) connection setup message. Alternatively, the network slice request information may be included in a non-access stratum (NAS) message included in the RRC connection setup message. That is, the UE may transmit the network slice request information through high layer signaling.

**【0087】** The network slice request information may include the specific network slice information configured for the UE. For example, the network slice request information may include information on at least one of network slices configured for the UE, information for identifying a network slice service/PDU session/bearer associated with the corresponding network slice information, and information on a priority of the corresponding network slice. In this example, the “network slice information associated with the UE” refers to information on a network slice configured for the UE by a network or to slice information allowed by the network based on subscription information.

**【0088】** The UE may perform a step of receiving, from the base station, the handover command generated based on the specific network slice information received by the target base station from the core network entity (S430). As described above, the core

network entity may identify information on the specific network slice based on the network slice request information and the subscription information.

【0089】 In the case of the handover of the UE, the core network entity may transmit the identified specific network slice information to the target base station. When the target base station receives the specific network slice information, the target base station may generate a handover command for the UE based on at least one of the specific network slice information and network slice information allowed by the target base station. The target base station may transfer the generated handover command to the base station, and the base station may transmit the handover command to the UE.

【0090】 Through these processes, the UE may perform the handover through the network slice while maintaining the continuity of a service.

【0091】 As described above, it is possible for the UE, the base station and the core network entity to establish a service through a network slice, maintain the continuity of a network slice service and provide the mobility of the UE.

【0092】 Hereinafter, more detailed embodiments for maintaining the mobility of an RRC connected UE are discussed in detail. Each embodiment described below may be performed independently or in combination with one or more other embodiments, and each embodiment may include different one or more embodiments from those described referring to FIGS. 2 to 4. In addition, the base station and the UE discussed in the embodiments described with reference to FIGS. 2 to 4 may be performed in each of embodiments described below as well.

【0093】 First Embodiment: Transferring UE Indication Information Including Network Slice Information

【0094】 In the case of a UE in an RRC connected state, it may be effective from a network perspective that a handover is performed to a cell supporting a network slice (or a cell supporting a specific network slice configured for the corresponding UE).

【0095】 In addition, in the case of a UE in an RRC IDLE state or a UE in an RRC INACTIVE state, for RRC connection establishment of the UE, recognizing by a base station that a specific network slice is configured for the UE may be helpful for the UE to select a cell/network for consecutively providing a service based on the corresponding network slice as the UE moves.

【0096】 For example, when a serving cell (or a current cell or a Pcell (hereinafter, referred to as “serving cell”)) provides network slice information through system information, and the UE receives the network slice information through the system information from the serving cell, or when a specific network slice is configured for the UE in advance, or when a specific network slice is configured for the UE through a network,

the UE may indicate request information (network slice request information) on this to the base station.

**【0097】** The network slice request information represents single slice information configured for the UE or a collection of single slice information configured for the UE. This represents information on a network slice allowed by a network based on the slice information configured for the UE by the network or subscription information. Hereinafter, the request information on the network slice may be used with the same meaning. For another example, a UE configured with a network slice, a UE configured with data transmission and reception through a specific network slice, a UE available for network slicing, or a UE intending to perform data communication based on a specific network slice through network slicing, in the RRC IDLE state may initiate a procedure of indicating configured slice request information to a base station in the case of at least one of when RRC connection establishment is performed, when entering or leaving a cell/network supporting/allowing a current network slice, when initiating or terminating a PDU session, when network slicing related system information is changed, when a configured network slice for receiving through network slicing is changed, when a configured network slice service for receiving through network slicing is changed. For example, a UE receiving the network slice information configured when a PDU session is established through a previous network attachment procedure may initiate a procedure of indicating corresponding network slice request information to a base station when a RRC connection is established.

**【0098】** For another example, when a UE is configured with a network slice, when a UE is configured with data transmission and reception through a specific network slice, when a UE is able to support network slicing, or when a UE performs data communication based on a specific network slice through network slicing, in the RRC INACTIVE state, the UE may initiate a procedure of indicating network slice request information to a base station in the case of at least one of: when RRC connection establishment is performed; when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; or when a configured network slice service for receiving through network slicing is changed. In this example, the RRC INACTIVE state represents a new state based on a core network connection in the NR. The new state may satisfy the following characteristics.

**【0099】** While the UE is in the new state, the attributes of UE, RAN and CN are characterized as follows:

**【0100】** - The connection between CN and RAN is maintained in terms of both control and user planes.

**【0101】** - The UE is reachable by a RAN initiated notification procedure for which the relevant parameters are configured by RAN itself.

**【0102】** - RAN is tracking the UE location on the level of a “RAN-based notification area” and is aware whenever the UE moves from one “RAN-based notification area” to another.

**【0103】** As another example, a UE configured with a network slice, a UE configured with data transmission and reception through a specific network slice, a UE available to network slicing, or a UE intending to perform data communication based on a specific network slice through network slicing, in the RRC CONNECTED state may initiate a procedure of indicating network slice request information to a base station in the case of at least one of: when RRC connection establishment is performed; when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; when a configured network slice service for receiving through network slicing is changed; or when an RRC connection reconfiguration confirmation message is transmitted to a target base station after having received an RRC connection reconfiguration message including mobility control information.

**【0104】** The network slicing may be operated independently even between cells/base stations using an identical frequency. Additionally/alternatively, the network slicing area may be configured regardless of a frequency.

**【0105】** The UE may include one or more slice information configured for the UE in the network slice request information. Alternatively, the UE may include, in the network slice request information, at least one of corresponding network slice information received through system information, configured for the UE in advance, or received through an RRC connection reconfiguration message, information for identifying a service/PDU session/bearer associated with the corresponding network slice information, and priority information on a corresponding network slice.

**【0106】** The network slice request information may be transmitted through a new field that may be included in an RRC message of at least one of a UE assistance message, an RRC connection establishment request message, an RRC connection setup complete message, or transmitted through a new RRC message newly defined. Alternatively, the network slice request information described above may be included in a NAS message and transmitted to a base station through an RRC connection setup complete message.

**【0107】** The base station may control data transmission and reception through network slicing based on the network slice request information received from UEs. For

example, the base station may initiate or terminate this. As another example, the base station may indicate network slice information to a UE. As another example, the base station may indicate a bearer associated with network slicing to a UE.

**【0108】 Second Embodiment: Transferring Network Slice Request Information to a Base Station Through a Core Network Entity**

**【0109】** In the case of a UE in the RRC Connected state, it may be effective from a network perspective that a handover is performed to a cell supporting a network slice (or a cell supporting/allowing a specific network slice configured for the corresponding UE).

**【0110】** In addition, in the case of a UE in an RRC IDLE state or a UE in an RRC INACTIVE state, recognizing by a base station that a specific network slice is configured for the UE may be helpful for the UE to consecutively receive a service based on the corresponding network slice as the UE moves.

**【0111】** For example, when a serving cell (or a current cell or a Pcell (hereinafter, referred to as “serving cell”)) provides network slice information through system information, and a UE receives the network slice information through the system information in the serving cell, and/or when a specific network slice is configured for the UE in advance; and/or when a specific network slice is configured for the UE through a network, the UE may indicate network slice request information on this to the base station through a core network entity (e.g., an access and mobility management function (AMF) which is a 5G core network entity).

**【0112】** As another example, a UE configured with a network slice, a UE configured with data transmission and reception through a specific network slice, a UE available to network slicing, or a UE intending to perform data communication based on a specific network slice through network slicing, in the RRC IDLE state may transmit network slice request information to a core network entity in the case of at least one of: when RRC connection establishment is performed; when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; when a configured network slice service for receiving through network slicing is changed; when a network attachment is performed; when a tracking area is updated; when a service request is performed; when network connection registration (registration/PDU session establishment) is performed.

**【0113】** As another example, a UE configured with a network slice, a UE configured with data transmission and reception through a specific network slice, a UE available to network slicing, or a UE intending to perform data communication based on a specific network slice through network slicing, in the RRC INACTIVE state may transmit

network slice request information to a core network entity in the case of at least one of: when RRC connection establishment is performed; when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; when a configured network slice service for receiving through network slicing is changed; when a network attachment is performed; when a tracking area is updated; when a service request is performed; when network connection registration (registration/PDU session establishment) is performed.

**【0114】** As another example, a UE configured with a network slice, a UE configured with data transmission and reception through a specific network slice, a UE available to network slicing, or a UE intending to perform data communication based on a specific network slice through network slicing, in the RRC connected state may transmit network slice request information to a core network entity in the case of at least one of: when RRC connection establishment is performed; when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; when a configured network slice service for receiving through network slicing is changed; when a network attachment is performed; when a tracking area is updated; when a service request is performed; when network connection registration (registration/PDU session establishment) is performed.

**【0115】** The core network entity (e.g., an AMF which is a 5G core network entity) may transmit specific network slice information to a base station through a procedure for setting up a UE context.

**【0116】** The network slicing may be operated independently even between cells/base stations using an identical frequency. Additionally/alternatively, the network slicing area may be configured regardless of a frequency. For example, a specific network slice may be configured in at least one cell/base station/area of a network and not provided in another cell/base station/area. When a UE performs at least one of network attachment, tracking area update, service request, or network connection registration/PDU session establishment, the corresponding network slice area may be one of an attachment area, a tracking area, or a set of cells, allocated by a core network entity (e.g., an AMF which is a 5G core network entity). Alternatively, when a UE performs at least one of network attachment, tracking area update, service request, or network connection registration/PDU session establishment, the corresponding network slice area may be one of an RAN notification area, or a set of cells, allocated by a base station.

**【0117】** The UE may include information on a specific slice configured for the UE in the network slice request information transmitted to the core network entity.

Alternatively, the UE may include, in the network slice request information, at least one of corresponding network slice information received through system information, configured for the UE in advance, or received through an RRC connection reconfiguration message, information for identifying a network slice service/PDU session/bearer associated with the corresponding network slice information, and priority information on a corresponding network slice. The slice information configured in advance which is included in the network slice request information represents slice information allowed by the network based on slice information configured for the UE by a network or subscription information.

【0118】 The base station may control data transmission and reception through network slicing based on the network slice request information received from the UE through the core network entity. The core network entity may verify the validity as to whether the UE has an access to the corresponding network slice. Accordingly, the base station may control data transmission and reception through network slicing based on the network slice request information received from the core network entity. For example, the base station may initiate or terminate this. As another example, the base station may indicate network slice information to the UE. As yet another example, the base station may indicate a bearer of a PDE session associated with the network slice to the UE. As yet another example, the base station may process data based on the network slice. As yet another example, the base station may select a RAN portion of the corresponding network slice and perform differentiated data processing for the corresponding network slice.

【0119】 Third Embodiment: Transferring Slice Information to a Target Base Station During a Handover

【0120】 While a UE in the RRC Connected state transmits and receive data through a specific network slice, a handover may be performed as the UE moves. As described above, recognizing that a neighboring cell supports the corresponding slice may be helpful for a 5G cell/base station/network to allow the UE to be handed over.

【0121】 As described in the first and second embodiments, a base station recognizes network slice information configured for the UE in the RRC Connected state or allowed in a network, by the support information (e.g., network slice request information) provided by the UE or a 5G core network entity.

【0122】 While preparing the handover, the source base station may transfer the network slice request information received from the UE to a target base station, if available. Alternatively, while preparing the handover, the source base station may transfer the network slice request information received from the core network entity to a target base station, if available. Alternatively, while preparing the handover, the source base station may transfer the network slice request information received from the UE or the core network entity to a target base station through the core network entity, if available. In this

example, the transferred network slice request information may refer to specific network slice information that the core network entity has identified based on subscription information.

**【0123】** As another example, before updating network slice information after the handover has been performed, the UE may read network slice related system information (or on-demand system information associated with network slice related minimum system information or control information for identifying whether network slicing is supported/allowed/configured/performed).

**【0124】** As yet another example, when network slice related minimum system information or control information for identifying whether network slicing is supported/allowed/configured/performed is not provided from a source cell, or when a UE that has not performed reception through network slicing performs a handover, the UE after the handover has been performed may indicate the configured network slice information to the base station.

**【0125】** For example, the network slice request information may be included in a handover request message and transmitted. Alternatively, the configured network slice information may be included in a handover preparation message and transmitted. Alternatively, the configured network slice information may be included in AS-context information of the handover preparation message and transmitted. Alternatively, a target cell/base station may include the network slice information in a handover response inter-base station interface (Xn) message or a handover command inter-node RRC message. For example, network slice information that is supported/allowed by a target cell/base station may be included.

**【0126】** As another example, when a target cell/base station does not support/allow a corresponding network slice, the target base station may include information for indicating this in a handover response inter-base station interface (Xn) message or a handover command Inter-node RRC message. For example, failed network slice information that is not supported/allowed by the target cell/base station may be included.

**【0127】** For example, when a target cell/base station has received the configured network slice information through a source cell/base station, and when the target cell/base station does not support/allow network slicing or does not provide the corresponding configured network slice through the network slicing, or the source cell and the target cell are included in different network slice areas from each other, the target base station may transfer, to the source base station, the handover response inter-base station interface (Xn) message including information for indicating not supporting/allowing the network slice received through the source base station. As another example, when the target cell/base

station has received the information through the source cell/base station, and when the target cell/base station does not support/allow network slicing or does not provide the corresponding configured network slice through the network slicing, the target base station may transfer a handover command inter-node RRC message including information for indicating this to a corresponding UE. As another example, the source base station may not determine the handover to the target base station.

【0128】 As another example, while preparing the handover, the source base station may transfer network slice information received from the UE or the core network entity to a target base station through the core network entity, if available. In the typical technology, a handover based on an interface between a core network entity and a base station is used only when a handover based on an inter-base station interface cannot be used. For example, in the typical LTE technology, a handover based on an interface (S1) between a core network entity and a base station is used only when a handover based on an inter-base station interface (X2) cannot be used. Similarly, in the 5G network, a handover based on an interface between a core network entity and a base station may be used only when a handover based on an inter-base station interface cannot be used. For example, the handover based on an interface between a core network entity and a base station may be used when a direct interface is not present between the source base station and the target base station, or when the source base station and the target base station are included in different network areas from each other. Thus, if a direct interface is not present between the source base station and the target base station, or if the source base station and the target base station are included in different network areas from each other, the source base station may transfer network slice information received from a UE or a core network entity to the target base station through the core network entity.

【0129】 Fourth Embodiment: Transferring Network Slice Information to a Target Base Station Through an RRC Connection Reconfiguration Confirmation Message

【0130】 For example, a UE may receive an RRC connection reconfiguration message including mobility control information through a source base station. As another example, a UE may receive an RRC connection reconfiguration message including mobility control information generated from a target base station through a source base station. The UE may include the network slice information (network slice related information or configured network slice information) in an RRC connection reconfiguration confirmation message. The network slice related information may include at least one of information for identifying a service/PDU session/bearer associated with corresponding network slice information, or bearer information of a PDU session associated with the network slice. Upon receipt of the network slice related information, the UE may initiate a procedure of

identifying the network slice information to a core network entity. To this end, the UE may transmit a NAS message including the network slice information to the base station.

**【0131】** The base station may control data transmission and reception through network slicing based on the information received from UEs. For example, the base station may initiate or terminate this. As another example, the base station may indicate network slice information to the UE. As another example, the base station may indicate a bearer associated with network slicing to the UE. As yet another example, the base station may process data based on the network slice.

**【0132】 Fifth Embodiment: Receiving Slice Information Through an Interface Between a Core Network and a Base Station from a Core Network Entity in the Process of a Handover**

**【0133】** A base station may receive slice information through an interface between the core network and the base station from the core network entity in the process of an inter-base station handover of a UE in the RRC Connected state. For example, when the core network entity receives a path change request message (e.g., a path switch request message) including specific network slice information from a target base station, the core network entity may transmit a path change request confirmation message including the specific network slice information. The base station may control data transmission and reception through a corresponding network slice based on the information received from the core network entity. For example, the base station may initiate or terminate this. As another example, the base station may indicate the network slice information to the UE. As another example, the base station may indicate a service/PDU session/bearer associated with the network slice to the UE. As yet another example, the base station may process data based on the network slice.

**【0134】** As another example, the core network entity may transmit specific network slice information to the base station for setting up/configuring a UE context for a network slice in a handover process of the RRC connected UE. A UE configured with a network slice, a UE configured with data transmission and reception through a specific network slice, a UE available to network slicing, or a UE intending to perform data communication based on a specific network slice through network slicing may transmit network slice request information to the core network entity in the case of at least one of: when RRC connection establishment is performed; when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; when a configured network slice service for receiving through network slicing is changed; when a network attachment is performed; when a tracking area is updated; when a service request is performed; or when

network connection registration (registration/PDU session establishment) is performed. As another example, a base station that has received network slice information from a UE or a core network entity, a base station that has indicated network slice information to a UE, a base station that has indicated a service/PDU session/bearer associated with a network slice to a UE, or a base station that processes data based on a corresponding network slice may transmit network slice request information to the core network entity in the case of at least one of: when entering or leaving a cell/network supporting/allowing a current network slice; when initiating or terminating a PDU session; when network slicing related system information is changed; when a configured network slice for receiving through network slicing is changed; when a configured network slice service for receiving through network slicing is changed; when a network attachment is performed; when a tracking area is updated; when a service request is performed; or when network connection registration (registration/PDU session establishment) is performed. The network slice request information may include network slice related information or configured network slice information. The network slice related information may be at least one of information for identifying a service/PDU session/bearer associated with corresponding network slice information, or bearer information of a PDU session associated with the network slice.

**【0135】** The core network entity may transmit specific network slice information to the base station for setting up a UE context for a corresponding network slice. To this end, the core network entity may indicate, to the base station, UE context information including specific configured network slice information according to a value that is included in subscriber information etc. through a subscriber information server etc. The UE context information transmitted by the core network entity may include network slice related information or configured network slice information. The network slice related information may be at least one of information for identifying a service/PDU session/bearer associated with the corresponding network slice information, or bearer information of a PDU session associated with the network slice.

**【0136】** For other example, while preparing the handover, the source base station may transfer specific network slice information received from the UE or the core network entity to a target base station through the core network entity, if available. The core network entity that has received the specific network slice information received from the source base station may transmit the specific network slice information to the target base station for setting up a UE context for a corresponding network slice.

**【0137】 Sixth Embodiment: Method of a UE for Transmitting Network Slice Information to a Base Station after a Handover has been Completed**

**【0138】** For example, in a handover process of a UE in an RRC Connected state, a source base station may transfer network slice information received from the UE or a core

network entity to a target base station through the core network entity, if available. When the UE receives a handover command generated from the target base station through the source base station, the UE performs the handover. The handover command may include the network slice information (network slice related information or configured network slice information). The network slice related information may include at least one of information for identifying a service/PDU session/bearer associated with the corresponding network slice information, or bearer information of a PDU session associated with the network slice. Upon receipt of the network slice related information, the UE may initiate a procedure for identifying the network slice information with the core network entity. The procedure of identifying the network slice information with the core network entity may be at least one of network attachment, a tracking area update, service request, network connection registration or PDU session establishment.

**【0139】** Through the operations described above, a UE may be able to consecutively use a service through a network slice even as the UE moves.

**【0140】** Hereinafter, a base station and a UE for performing a part or all of each embodiment described above will be discussed again with reference to the drawings.

**【0141】** FIG. 5 is a block diagram provided to explain a base station according to yet another embodiment.

**【0142】** Referring to FIG. 5, the base station 500 may include a receiver 530 that receives network slice request information from a UE configured with a network slice, and a controller 510 that controls so that the network slice request information is transferred to a core network entity.

**【0143】** In addition, the receiver 530 may receive specific network slice request information configured based on the network slice request information from the core network entity. The receiver 530 may receive the network slice request information through an radio resource control (RRC) connection setup message.

**【0144】** The network slice request information may include the specific network slice information configured for the UE. For example, the network slice request information may include information on at least one of network slices configured for the UE, information for identifying a network slice service/PDU session/bearer associated with the corresponding network slice information, and information on a priority of the corresponding network slice. In this example, the network slice information configured for the UE may refer to slice information configured for the UE by a network or slice information allowed by the network based on subscription information.

**【0145】** The base station 500 may further include a transmitter 520 that transmits the network slice request information to the core network entity. The transmitter 520 may

transmit the specific network slice information to a target base station. The specific network slice information transmitted to the target base station may be transmitted through the core network entity.

【0146】 Meanwhile, the controller 510 may control the overall operations of the base station 500 for receiving the network slice information from the UE and the core network entity, controlling the network slice information, and controlling the mobility of the UE.

【0147】 In addition, the transmitter 520 and the receiver 530 are used to transmit or receive signals, messages, data required to perform embodiments described above to or from the UE, the target base station and the core network entity.

【0148】 FIG. 6 is a block diagram provided to explain a configuration of UE according to yet another embodiment.

【0149】 Referring to FIG. 6, the UE 600 may include a controller 620 that configures network slice information, a transmitter 630 that transmits network slice request information to a base station, and a receiver 610 that receives, from the base station, a handover command generated based on specific network slice information received by a target base station from a core network entity.

【0150】 The controller 620 may configure one or a plurality of network slices, and configure such that one network slice is associated with one protocol data unit (PDU).

【0151】 The transmitter 630 may transmit the network slice request information through an radio resource control (RRC) connection setup message or a non-access stratum (NAS) message included in the RRC connection setup message.

【0152】 Meanwhile, the controller 620 may control the overall operations of the UE 600 for configuring the network slice through the base station or the core network entity and maintaining the continuity of a service through the network slice even when the UE moves.

【0153】 In addition, the transmitter 630 and the receiver 610 are used to transmit or receive signals, messages, data required to perform embodiments described above to or from the base station, the target base station and the core network entity.

【0154】 The standardized descriptions or documents mentioned in the embodiments described above are omitted for the sake of brevity, but they constitute a part of the present disclosure. Accordingly, it should be construed that the incorporation of the content of part of the standardized descriptions and documents into the detailed description and claims is included within the scope of the present disclosure.

【0155】 Although certain embodiments of the present disclosure have been described for illustrative purposes, those skilled in the art will appreciate that various

modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims. Therefore, exemplary aspects of the present disclosure have not been described for limiting purposes, but to describe the embodiments, the therefore, the scope of the present disclosure shall not be limited to such embodiments. The scope of protection of the present disclosure should be construed based on the following claims, and all technical ideas within the scope of equivalents thereof should be construed as being included within the scope of the present disclosure.

## CLAIMS

1. A method of a base station for transmitting and receiving data through a network slice, the method comprising:

receiving network slice request information from a user equipment (UE) configured with the network slice;

controlling so that the network slice request information is transferred to a core network entity; and

receiving, from the core network entity, specific network slice information configured based on the network slice request information.

2. The method according to claim 1, wherein the UE configures one or a plurality of network slices, wherein one network slice is associated with one protocol data unit (PDU) session.

3. The method according to claim 1, wherein the network slice request information is included in a radio resource control (RRC) connection setup message or a non access stratum (NAS) message included in the RRC connection setup message.

4. The method according to claim 1, wherein the specific network slice information is specified by the core network entity based on the network slice request information and subscription information, and included in UE context information and received.

5. The method according to claim 1, further comprising, after receiving the specific network slice information from the core network entity, transmitting the specific network slice information to a target base station.

6. The method according to claim 5, wherein the transmitting the specific network slice information to the target base station is performed through the core network entity.

7. A method of a UE for transmitting and receiving data through a network slice, the method comprising:

configuring a network slice;

transmitting network slice request information to a base station; and

receiving, from the base station, a handover command generated by a target base station based on specific network slice information received from a core network entity.

8. The method according to claim 7, wherein the configuring the network slice includes configuring one or a plurality of network slices, wherein one network slice is associated with one protocol data unit (PDU) session.

9. The method according to claim 7, wherein the network slice request information is included in a radio resource control (RRC) connection setup message or a non access stratum (NAS) message included in the RRC connection setup message.

10. The method according to claim 7, wherein the base station transmits the network slice request information to the core network entity and receives the specific network slice information configured based on the network slice request information from the core network entity.

11. A base station that controls data transmission and reception through a network slice, comprising:

a receiver that receives network slice request information from a UE configured with the network slice; and

a control unit that controls so that the network slice request information is transferred to a core network, wherein

the receiver further receives specific network slice information configured based on the network slice request information from the core network entity.

12. The base station according to claim 11, wherein the UE configures one or a plurality of network slices, wherein one network slice is associated with one protocol data unit (PDU) session.

13. The base station according to claim 11, wherein the network slice request information is included in a radio resource control (RRC) connection setup message or a non access stratum (NAS) message included in the RRC connection setup message.

14. The base station according to claim 11, wherein the specific network slice information is specified by the core network entity based on the network slice request information and subscription information, and included in UE context information and received.

15. The base station according to claim 11, further comprising a transmitter that, after receiving the specific network slice information from the core network object, transmits the specific network slice information to a target base station.

16. The base station according to claim 15, wherein the transmitter transmits the specific network slice information through the core network entity.

17. A UE that controls data transmission and reception through a network slice, comprising:

- a control unit that configures the network slice;
- a transmitter that transmits network slice request information to a base station; and
- a receiver that receives, from the base station, a handover command generated by the target base station based on specific network slice information received from a core network entity.

18. The UE according to claim 17, wherein the control unit configures one or a plurality of network slices, wherein one network slice is associated with one protocol data unit (PDU) session.

19. The UE according to claim 17, wherein the network slice request information is included in a radio resource control (RRC) connection setup message or a non access stratum (NAS) message included in the RRC connection setup message.

20. The UE according to claim 17, wherein the base station transmits the network slice request information to the core network entity and receives the specific network slice information configured based on the network slice request information from the core network entity.

**【Abstract of the Disclosure】**

**【Abstract】**

The disclosure relates to a technology for providing a network slice in a next generation mobile communication network, and, to a technology for providing services according to a movement of a user equipment (UE) using network slice-based services without interruption. An embodiment provides a method and apparatus including a method of a base station for controlling data transmission/reception through a network slice, the method including steps of: receiving network slice request information from a user equipment (UE) configured with the network slice; controlling so that the network slice request information is transferred to a core network entity; and receiving, from a core network entity, specific network slice information configured based on the network slice request information.

**【Representative Drawing】**

FIG. 2

FIGS

FIG. 1

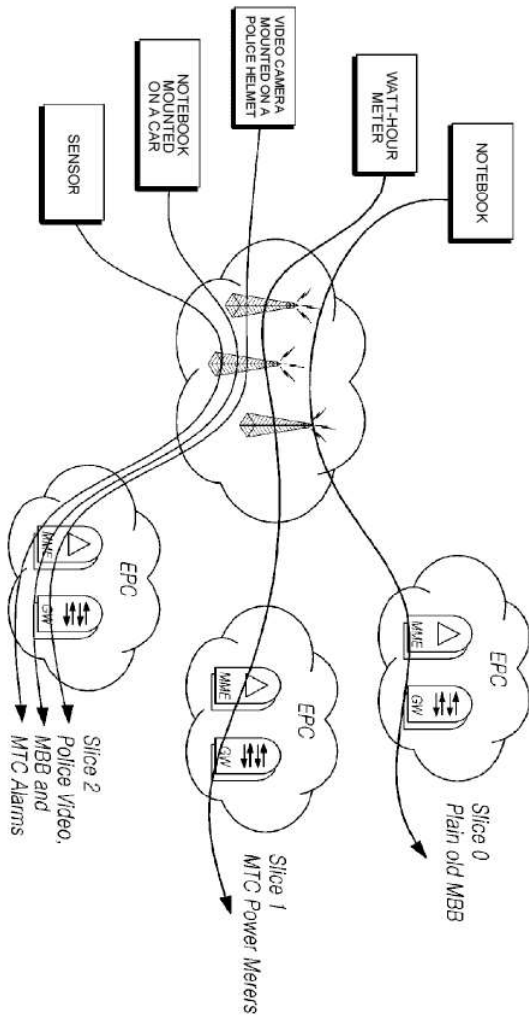


FIG. 2

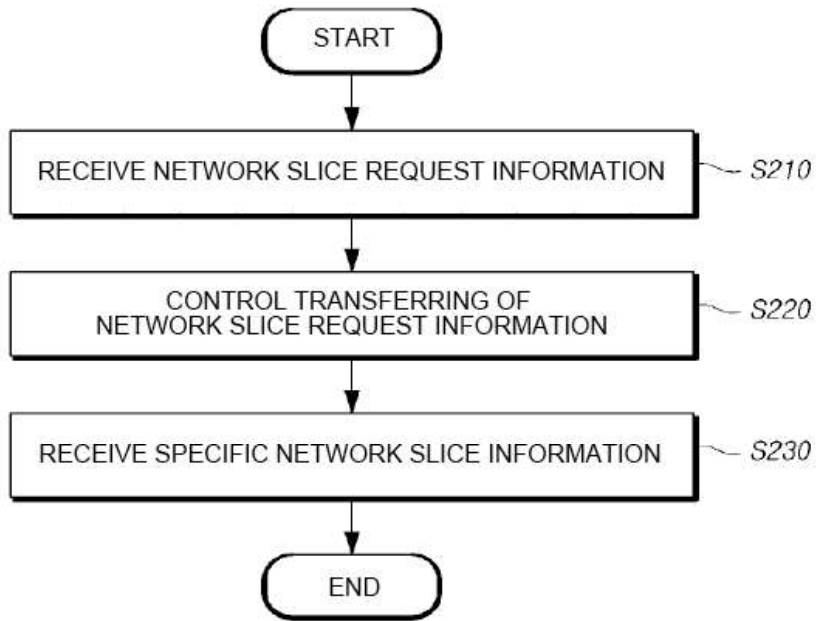


FIG. 3

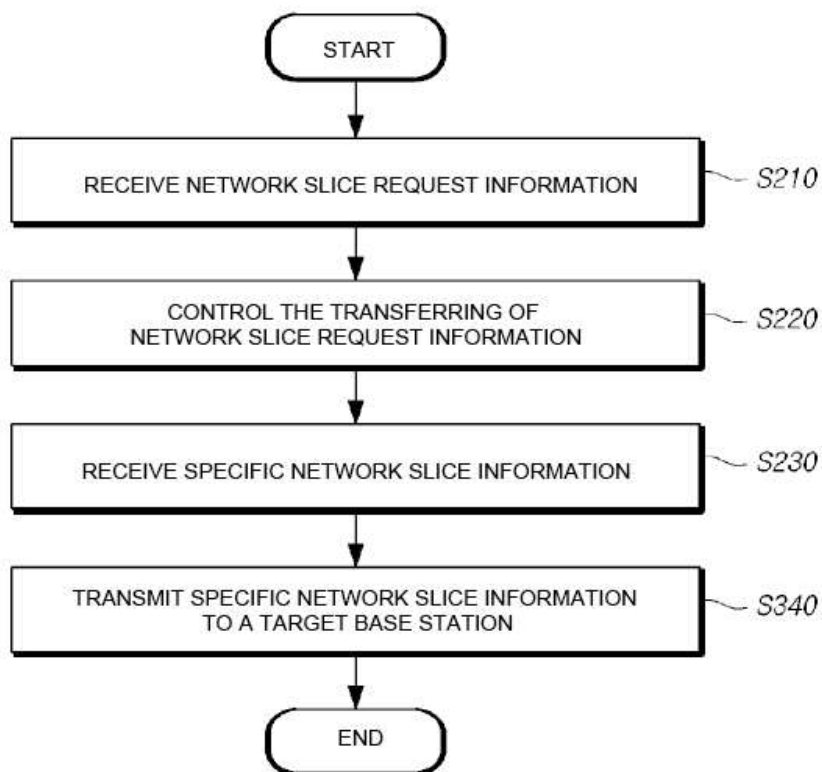


FIG. 4

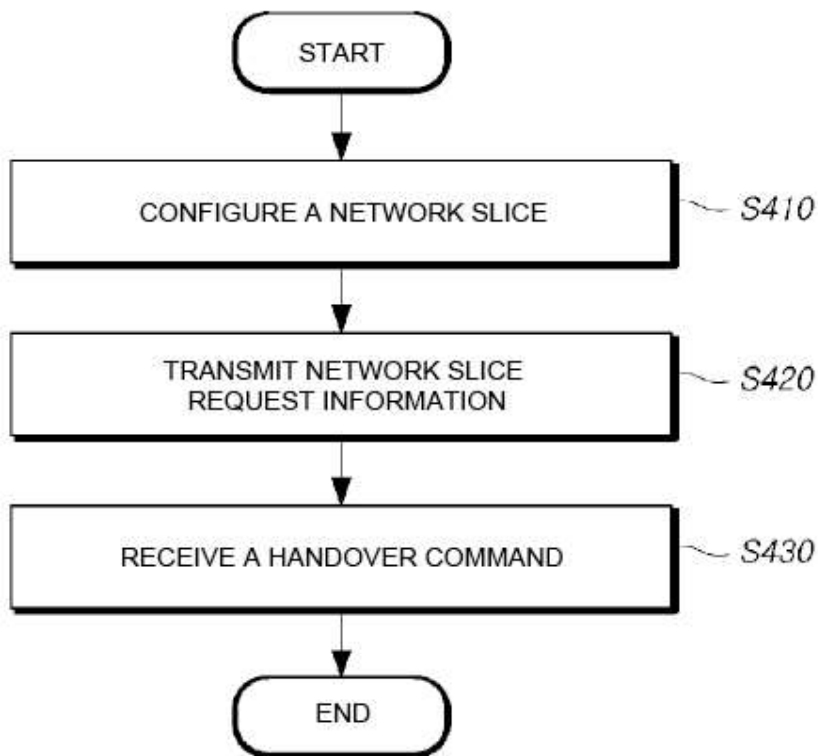


FIG. 5

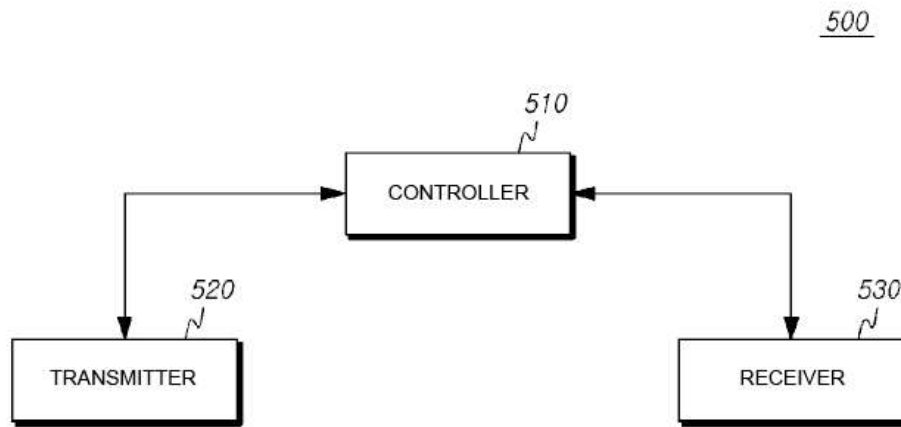
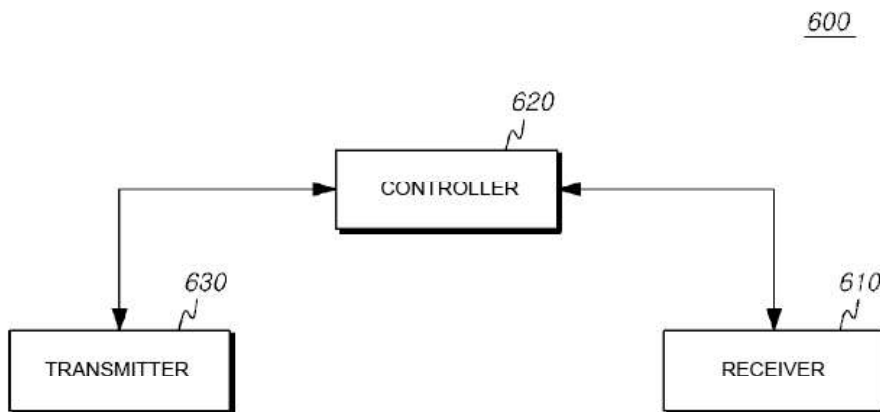


FIG. 6





## TRANSLATOR'S CERTIFICATE OF TRANSLATION

Questel-Orbit, Incorporated  
2331 Mill Road, Suite 600  
Alexandria, VA 22314, U.S.A.  
www.questel.com

Questel Project Number: AAB2430010UT  
Date: July 30, 2024

To whom it may concern:

I, Jin-hee, KANG, a translator fluent in Korean and English languages, on behalf of Questel, do solemnly and sincerely declare that the following is, to the best of my knowledge and belief, a true and correct translation of the document(s) listed below in a form that best reflects the intention and meaning of the original text.

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

Original Document Identifier: KR 10-2017-0142205 631 priority document-1.pdf  
Translated Document Identifier: J Spotts 611779.\_KR 10-2017-0142205\_Application\_en-US.docx

Signed this 30th day of July, 2024

---

Signature

Jin-hee, KANG

---

Name