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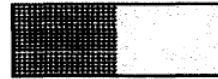
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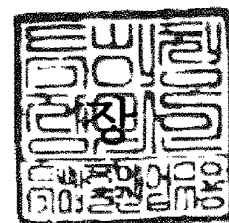
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【Purpose】	This is hereby submitted to the Commissioner of the Korean Intellectual Property Office.
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[DESCRIPTION OF INVENTION]

[TITLE OF INVENTION]

APPARATUS AND METHOD OF RESOURCE ALLOCATION FOR DATA CHANNEL FOR NEW RADIO (NR)

[TECHNICAL FIELD]

[0001] The embodiments herein relate to a method of allocating data channel resources for a data channel for a next-generation/5G wireless access network (hereinafter referred to as “New Radio (NR)”) for which discussion has been started in 3GPP.

[CONTENTS OF INVENTION]

[SOLUTIONS TO PROBLEMS]

[0002] One embodiment provides a method of allocating data channel resources for a next-generation wireless access network, including configuring bitmap-based symbol allocation information for all symbols constituting a transmission time interval (TTI) set for a terminal, transmitting the symbol allocation information by including the symbol allocation information in an uplink/downlink data assignment downlink control information (DCI), and acquiring the symbol allocation information within a slot allocated for uplink/downlink data transmission and reception.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[0003] FIG. 1 is a view showing an example of symbol level alignment among different sub-carrier spacings (SCSs).

FIG. 2 is a view showing TDM based multiplexing between eMBB and URLLC within a slot (or eMBB TTI).

FIG. 3 is a diagram showing a configuration of a base station according to another embodiment.

FIG. 4 is a diagram showing a configuration of a user equipment according to another embodiment.

[DETAILED DESCRIPTION FOR CARRYING OUT THE INVENTION]

[0004] Hereinafter, some embodiments of the present invention will be described in detail with reference to exemplary drawings. In adding reference numerals to the components of each drawing, it should be noted that the same components are given the same reference numerals as much as possible even though they are shown on different drawings. Furthermore, in the description of the present invention, if it is determined that the detailed description of the known technology related to the present invention may unnecessarily obscure the subject matter of the present invention, the detailed description thereof will be omitted.

[0005] In the present specification, a machine-type communication (MTC) terminal may refer to a terminal that supports low cost (or low complexity) or a terminal that supports coverage enhancement. In the present specification, an MTC terminal may refer to a terminal that supports low cost (or low complexity) and coverage enhancement. Alternatively, in the present specification, an MTC terminal may refer to a terminal defined as a specific category for supporting low cost (or low complexity) and/or coverage enhancement.

[0006] That is, in the present specification, an MTC terminal 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, in the present specification, the MTC terminal may refer to a UE category/type defined in the existing 3GPP Release-12 or lower that supports improved coverage compared to the existing LTE coverage, or supports low power consumption, or a newly defined Release-13 low cost (or low complexity) UE category/type.

[0007] A wireless communication system of the present invention is widely deployed to provide various communication services such as voice, packet data, and the like. The wireless communication system includes a user equipment (UE) and a base station (BS or eNB). The user equipment in the present specification is a comprehensive concept referring to a terminal in wireless communication, and should be interpreted as a concept that includes not only a user equipment (UE) in WCDMA, LTE, HSPA, or the like, but also a mobile station (MS), a user terminal (UT), a subscriber station (SS), a wireless device, or the like, in GSM.

[0008] A base station or cell generally refers to a station that communicates with user equipments, and may be called by other terms such 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 the like.

[0009] That is, in the present specification, a base station or cell should be interpreted as a comprehensive meaning indicating a part of an area or function covered by a base station controller (BSC) in CDMA, a NodeB in WCDMA, an eNB or sector (site) in LTE, or the like, and is a meaning encompassing various coverage areas, including a megacell, a macrocell, a microcell, a picocell, a femtocell, and a relay node, and RRH, RU, and small cell communication ranges.

[0010] Since the various cells listed above have each a base station that controls the cell, the base station may be interpreted in two meanings. The base station may i) indicates a device itself that provides a megacell, a macrocell, a microcell, a picocell, a femtocell, or a small cell in relation to a wireless area, or ii) indicate the wireless area itself. In i), wireless devices that provide a given wireless area that are controlled by the same entity or all devices interacting with each other to cooperatively form the wireless area are indicated as base stations. Depending on a configuration scheme of a wireless area, an eNB, an RRH, an antenna, an RU, a low power node (LPN), a point, a transmission/reception point, a transmission point, a reception point, or the like, become examples of base stations. In ii), from the perspective of a user equipment or a neighboring base station, a wireless area itself where a signal is received or transmitted may be indicated as base stations.

[0011] Therefore, 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, and the reception point are collectively referred to as base stations.

[0012] In the present specification, the user equipment and the base station are used in a comprehensive sense as two transmitting and receiving entities used to implement the technology or technical idea described in the present specification, and are not limited by any specifically designated term or word. The user equipment and the base station are used in a comprehensive sense as two (uplink or downlink) transmitting and receiving entities used to implement the technology or technical

idea described in the present invention, and are not limited by any specifically designated term or word. Here, uplink (UL) refers to a method of transmitting and receiving data from a user equipment to a base station, and downlink (DL) refers to a method of transmitting and receiving data from a base station to a user equipment.

[0013] There are no limitations on the multiple access techniques applied to wireless communication systems. Various multiple access techniques may be used, such as Code Division Multiple Access (CDMA), Time Division Multiple Access (TDMA), Frequency Division Multiple Access (FDMA), Orthogonal Frequency Division Multiple Access (OFDMA), OFDM-FDMA, OFDM-TDMA, and OFDM-CDMA. One embodiment of the present invention may be applied to resource allocation in the fields of asynchronous wireless communications evolving to LTE and LTE-advanced through GSM, WCDMA, and HSPA, and synchronous wireless communications evolving to CDMA, CDMA-2000, and UMB. The present invention should not be construed as being limited or restricted to a specific wireless communication field, but should be construed as including all technical fields to which the ideas of the present invention may be applied.

[0014] Uplink transmission and downlink transmission may use the Time Division Duplex (TDD) method, which performs transmission using different times, or the Frequency Division Duplex (FDD) method, which performs transmission using different frequencies.

[0015] In addition, in systems such as LTE and LTE-advanced, the standards are configured by configuring uplink and downlink based on one carrier or a pair of carriers. The uplink and downlink transmit control information through control channels such as the Physical Downlink Control CHannel (PDCCH), Physical Control Format Indicator CHannel (PCFICH), Physical Hybrid ARQ Indicator CHannel (PHICH), Physical Uplink Control CHannel (PUCCH), Enhanced Physical Downlink Control CHannel (EPDCCH), or the like, and transmit data through data channels such as the Physical Downlink Shared CHannel (PDSCH), Physical Uplink Shared CHannel (PUSCH), or the like.

[0016] Meanwhile, control information may also be transmitted using the enhanced PDCCH or extended PDCCH (EPDCCH).

[0017] In the present specification, a cell may refer to a coverage of a signal transmitted from a transmission/reception point or a component carrier having the coverage of the signal transmitted from the transmission/reception point, or the transmission/reception point itself.

[0018] The wireless communication system to which the embodiments are applied may be a coordinated multi-point transmission/reception system (CoMP system), a coordinated multi-antenna transmission system, or a coordinated multi-cell communication system in which two or more transmission/reception points cooperate to transmit signals. The CoMP system may include at least two multiple transmission/reception points and terminals.

[0019] The multiple transmission/reception points may be a base station or a macro cell (hereinafter referred to as 'eNB') and at least one RRH with high transmission power or low transmission power within the macro cell area, which is connected to the eNB using an optical cable or optical fiber and is controlled by wire.

[0020] Hereinafter, downlink refers to communication or a communication path from multiple transmission/reception points to a terminal, and uplink refers to communication or a communication path from a terminal to multiple transmission/reception points. In the downlink, a transmitter may be a part of a multiple transmission/reception point, and a receiver may be a part of a terminal. In the uplink, the transmitter may be a part of a terminal, and the receiver may be a part of a multiple transmission/reception point.

[0021] Hereinafter, a situation in which signals are transmitted and received through channels such as the PUCCH, PUSCH, PDCCH, EPDCCH, and PDSCH is also expressed as “transmitting and receiving the PUCCH, PUSCH, PDCCH, EPDCCH, and PDSCH.”

[0022] In addition, in the following, the description of transmitting or receiving a PDCCH or transmitting or receiving a signal via a PDCCH may be used to mean transmitting or receiving an EPDCCH or transmitting or receiving a signal via an EPDCCH.

[0023] That is, the physical downlink control channel described below may refer to the PDCCH or EPDCCH, and is also used to refer to both the PDCCH and EPDCCH.

[0024] In addition, for convenience of description, the EPDCCH, which is one embodiment of the present invention, may be applied to a part described as the PDCCH, and the PDCCH, which is one embodiment of the present invention, may be applied to a part described as the EPDCCH.

[0025] Meanwhile, higher layer signaling described below includes RRC signaling that transmits RRC information including RRC parameters.

[0026] The eNB performs downlink transmission to terminals. The eNB may transmit a Physical Downlink Shared Channel (PDSCH), which is a primary physical channel for unicast transmission, and a Physical Downlink Control Channel (PDCCH) for transmitting downlink control information such as scheduling required for reception of the PDSCH or the like and scheduling grant information for transmission on an uplink data channel (e.g., a Physical Uplink Shared Channel (PUSCH)). Hereinafter, the transmission and reception of signals through each channel will be described in the form in which the respective channel is transmitted and received.

[0027] **New Radio (NR)**

[0028] 3GPP has recently approved the “Study on New Radio Access Technology”, which is a study item for research on next-generation/5G radio access technology, and based on the study item, in RAN WG1, discussions have begun on frame structure, channel coding & modulation, waveform & multiple access scheme for New Radio (NR). NR is required to be designed to not only provide improved data transmission rates compared to LTE, but also satisfy various requirements for each detailed and specific usage scenario. In particular, enhancement Mobile BroadBand (eMBB), massive MTC (mMTC), and Ultra Reliable and Low Latency Communications (URLLC) have been suggested as representative usage scenarios of NR, and a design for a frame structure that is flexible compared to LTE is required as a method for satisfying the requirements of each usage scenario. Specifically, eMBB, mMTC, and URLLC are being considered as representative usage scenarios of NR under discussion in 3GPP. Since each usage scenario has different requirements for data rates, latency, coverage, and the like, there is a growing need for a method for efficiently multiplexing radio resource units based on different numerologies (e.g., subcarrier spacing, a subframe, a TTI, etc.) as a method for

efficiently satisfying the requirements of each usage scenario through frequency bands that constitute an arbitrary NR system.

[0029] As one method for efficiently multiplexing, discussions have been held on a method of supporting multiplexing based on TDM, FDM, or TDM/FDM through a single NR carrier for numerologies with different subcarrier spacing values and a method of supporting one or more time units in configuring a scheduling unit in the time domain. In this regard, in NR, a subframe has been defined as a type of time domain structure, and as a reference numerology for defining a corresponding subframe duration, it has been decided to define a single subframe duration consisting of 14 OFDM symbols with normal CP overhead based on 15 kHz sub-carrier spacing (SCS) identical to LTE. Accordingly, in NR, a subframe has a time duration of 1 ms. However, unlike LTE, the subframe in NR is an absolute reference time duration, and slots and mini-slots may be defined as time units that serve as the basis for actual uplink/downlink data scheduling. In this case, the number of OFDM symbols constituting the corresponding slot, that is, a y value, is defined as $y = 7$ and 14 for a numerology having an SCS value up to 60 kHz, and is decided to have the value $y = 14$ for a numerology having an SCS value greater than 60 kHz.

[0030] Accordingly, any slot may consist of 7 or 14 symbols, and depending on a transmission direction of the slot, all symbols may be used for DL transmission, all symbols may be used for UL transmission, or may be used in the form of DL portion + (gap) + UL portion.

[0031] In addition, a mini-slot consisting of a smaller number of symbols than the corresponding slot may be defined in an arbitrary numerology (or SCS), and based on the mini-symbol, a short time-domain scheduling interval for uplink/downlink data transmission/reception may be configured or a long time-domain scheduling interval for uplink/downlink data transmission/reception may be configured through slot aggregation. In particular, for transmission and reception of latency critical data such as URLLC, it may be difficult to satisfy the latency requirement when scheduling is performed in units of slots based on 0.5 ms or 1 ms defined in a frame structure based on a numerology having a small SCS value such as 15 kHz, and thus, to prepare for the difficulty, a mini-slot consisting of a smaller number of OFDM symbols than the corresponding slot may be defined so that

scheduling for latency critical data such as the corresponding URLLC may be performed based on the mini-slot.

[0032] Alternatively, as described above, a method of scheduling data according to latency requirements based on the slot (or mini-slot) length defined for each numerology by multiplexing and supporting numerologies with different SCS values within one NR Carrier in the TDM and/or FDM manner, is being considered. For example, in a case of SCS 60 kHz as illustrated in FIG. 1, the symbol length is reduced to about 1/4 compared to a case of SCS 15 kHz, and thus when constituting one slot with the same 7 OFDM symbols, the slot length based on 15 kHz becomes 0.5 ms, while the slot length based on 60 kHz is reduced to approximately 0.125 ms.

[0033] In this way, in NR, discussions are underway on a method of satisfying the requirements of URLLC and eMBB by defining different SCS or different TTI lengths.

[0034] **[Timing relationship between control and data for NR]**

[0035] According to the decision of the last 3GPP RAN1 meeting, in NR, as a method of determining HARQ ACK/NACK feedback timing according to reception of downlink data of a terminal, methods of dynamically setting by L1 signaling (e.g., DCI), semi-statically setting by a higher layer, or setting by a combination of the higher layer and the dynamic L1 signaling are being considered.

[0036] Also, as methods of determining timing between UL assignment and corresponding UL data transmission, methods of dynamically setting by L1 signaling (e.g., DCI), semi-statically setting by a higher layer, or setting by a combination of a higher layer and the dynamic L1 signaling are also being considered.

[0037] In addition, although it was not discussed through the 3GPP meeting, for DL assignment and the corresponding DL data reception timing, methods of dynamically setting by the base station through L1 signaling (e.g., DCI), semi-statically setting by a higher layer, or setting by a combination of the higher layer and the dynamic L1 signaling may be considered.

[0038] Below is the content of 86 bis Chairman's note on this matter.

[0039] **Agreements:**

[0040] • Timing relationship between DL data reception and corresponding acknowledgement can be (one or more of, FFS which ones)

[0041] - dynamically indicated by L1 signaling (e.g., DCI)

[0042] - semi-statically indicated to a UE via higher layer

[0043] - a combination of indication by higher layers and dynamic L1 signaling (e.g., DCI)

[0044] • FFS: minimum interval between DL data reception and corresponding acknowledgement

[0045] • FFS: common channels (e.g., random access)

[0046] **Agreements:**

[0047] • Timing relationship between UL assignment and corresponding UL data transmission can be (one or more of, FFS which ones)

[0048] - dynamically indicated by L1 signaling (e.g., DCI)

[0049] - semi-statically indicated to a UE via higher layer

[0050] - a combination of indication by higher layers and dynamic L1 signaling (e.g., DCI)

[0051] • FFS: minimum interval between UL assignment and corresponding UL data transmission

[0052] • FFS: common channels (e.g., random access)

[0053] In the present invention, a method for configuring downlink control information (DCI) to support a method of transmitting and receiving URLLC data based on a short TTI length and eMBB data based on a long TTI length by multiplexing them with TDM within a given frequency resource in NR is suggested.

[0054] According to the uplink/downlink data resource allocation method in the existing LTE/LTE-A system, resource allocation has been performed in units of resource blocks (RBs) on a frequency axis and in units of subframes on a time axis. Specifically, according to the resource allocation method for the downlink data

channel, PDSCH, the corresponding DL assignment DCI is defined to transmit PDSCH transmission resource allocation information in the same subframe, and the UL grant DCI is defined to indicate PUSCH transmission resource allocation information in an uplink subframe after 4 subframes. Accordingly, a corresponding terminal performs a reception operation for corresponding downlink data through all OFDM symbols except a control region for PDCCH transmission in the downlink subframe, and transmits uplink data of the corresponding terminal through all SC-FDMA symbols of a corresponding uplink subframe, or all SC-FDMA symbols that except the last symbol when an SRS is configured, in the uplink subframe.

[0055] As described above, in NR, a slot may be defined as a time-domain scheduling unit (or TTI) within a frame structure based on a given SCS value. However, resource allocation for latency-critical URLLC data may be performed additionally within the slot in mini-slot units or large SCS-based slot units. To this end, it is possible to configure the RBs of NR, in which resource allocation is performed in units of time-domain scheduling units (or TTIs) of a short length, such as large SCS-based slots, small SCS-based mini-slots, or the like and the RBs of NR, in which resource allocation is performed in units of small SCS-based slots, that is, time-domain scheduling units (or TTIs) of a relatively long length by separating them from the frequency band, but as illustrated in FIG. 2, by transmitting and receiving the corresponding URLLC data and eMBB data in the same frequency band and RB by multiplexing the data in the TDM method for each time-domain scheduling unit (or TTI), it is possible to enhance the resource usage efficiency of the FDM-based multiplexing method on the frequency axis.

[0056] In this case, for a NR terminal where a time-domain scheduling unit (or TTI) of a relatively long time, such as eMBB or mMTC, is defined, there is a need to additionally indicate resource allocation information in units of symbols or units of symbol groups within the corresponding scheduling unit. Therefore, as a resource allocation method for uplink/downlink data channels (e.g., NR PDSCH or NR PUSCH) for any NR terminal, the present invention suggests a method of including, in downlink control information (DCI) transmitting scheduling control information on a corresponding uplink/downlink data channel, not only frequency resource allocation information (RB allocation information), but also symbol

allocation information in units of OFDM symbols or symbol groups constituting a time-domain scheduling unit (or TTI) set for the corresponding terminal.

[0057] **Point 1. Method of allocating in units of symbols**

[0058] As a method of configuring symbol allocation information for uplink/downlink data through DCI, bitmap-based symbol allocation information may be configured for all symbols constituting a TTI set for a corresponding terminal to be included in corresponding uplink/downlink data assignment DCI. For example, in configuring DCI for transmitting uplink/downlink data scheduling control information about any NR terminal for which the time-domain scheduling unit (or TTI) is set in units of slots consisting of 7 symbols based on SCS 15 kHz to the corresponding terminal, a symbol allocation information area consisting of a bitmap of 7 bits may be included. In this case, each of the bits constituting the bitmap configuration information of the 7 bits is mapped one to one to the 7 symbols of the slot constituting the TTI, and thus according to the corresponding configuration information, the base station and the terminal may each configure/acquire additional symbol allocation information to be used for transmission/reception of corresponding data within slots allocated for uplink/downlink data transmission/reception.

[0059] As another method of configuring symbol allocation information about uplink/downlink data through DCI, a bitmap may be configured in units of symbol groups for all symbols constituting the TTI set for the corresponding terminal to be included in the uplink/downlink data assignment DCI. At this time, a symbol group size mapped to each bit constituting the bitmap may be determined by a mini-slot or larger SCS-based slot size defined for latency critical data such as URLLC within the TTI. For example, for any NR terminal with the TTI set in units of slots consisting of 7 symbols based on 15 kHz, when 3 mini-slots consisting of 2 symbols, 2 symbols, and 3 symbols, respectively, are defined in one slot to support a short-term TTI for latency critical data such as URLLC within a corresponding cell, in configuring DCI for transmitting uplink/downlink data scheduling control information about the corresponding NR terminal, a symbol allocation information area consisting of a bitmap of 3 bits may be included. In this case, each of the bits constituting the corresponding bitmap configuration information of 3 bits is mapped one to one to symbol groups constituting three mini-slots defined within the corresponding slot

(that is, the mini-slots of 2 symbols, 2 symbols, and 3 symbols, respectively, as described above), and thus according to the corresponding configuration information, the base station and the terminal may each configure/acquire additional symbol allocation information to be used for transmission/reception of corresponding data within slots allocated for uplink/downlink data transmission/reception. However, in this case, the size of the symbol group that becomes a symbol allocation unit (that is, the number of OFDM symbols constituting one symbol group) and the number of symbol groups (a bitmap size accordingly) may be determined by a size of the TTI set for the corresponding terminal and a size of the short-term TTI configured within the corresponding TTI (2 symbols or 3 symbols, which is the size of the mini-slot corresponding to the short-term TTI in the above example) and the number of short-term TTIs accordingly (corresponding to 3 in the above example), and in this regard, a pre-defined value may be defined according to an SCS value supported by the corresponding cell and an SCS value and TTI size at which the corresponding terminal operates, or may be set by the base station through cell-specific/UE-specific higher layer signaling.

[0060] As another method of configuring symbol allocation information for uplink/downlink data through DCI, a symbol allocation candidates table may be configured for all symbols constituting the TTI set for the corresponding terminal, and symbol allocation index indication information based on the corresponding table may be included in the DCI so that the base station transmits it.

[0061] For example, for any NR terminal with the TTI set in slot units consisting of 7 symbols based on 15 kHz as described above, the symbol allocation candidates table in units of 2 symbols, 2 symbols and 3 symbols identical to the embodiment for bitmap-based symbol allocation described above may be configured as shown in Table 1 below. Accordingly, depending on a symbol allocation field configuration value within the corresponding DCI, symbol allocation information to be used for actual uplink/downlink data transmission/reception for the corresponding terminal may be configured/acquired among 7 symbols #0 to 6 constituting the TTI defined for the corresponding terminal.

[0062] However, in this case, the symbol allocation table may be pre-defined by SCS values supported by the cell or the size of the TTI, or may be configured by the base station through cell-specific/UE-specific RRC signaling.

[0063] [Table 1]

Examples of symbol allocation table

Symbol allocation field in DCI	Allocated symbol indices for PDSCH (or PUSCH)
000	0,1,2,3,4,5,6
001	0,1,2,3
010	0,1,4,5,6
011	2,3,4,5,6
100	0,1
101	2,3
110	4,5,6
111	reserved

[0064] **Point 2. Configuration of symbol-level allocation**

[0065] In addition, symbol allocation described in point 1 above may be configured by the base station through UE-specific/cell-specific RRC signaling. Accordingly, when symbol-level allocation is configured (that is, is enabled) through the corresponding UE-specific/cell-specific RRC signaling, the symbol allocation information area described above is to be included in the DL assignment DCI and/or UL assignment DCI for the corresponding NR terminal. Conversely, when the symbol-level allocation is not configured (that is, is disabled) via the corresponding UE-specific/cell-specific RRC signaling, the symbol allocation information area described above is not to be included in the DL assignment DCI and/or UL assignment DCI for the corresponding NR terminal.

[0066] Alternatively, the symbol allocation described in point 1 above may be implicitly enabled or disabled depending on the SCS value and TTI length defined for the corresponding terminal. For example, for any NR terminal operating based on an SCS value smaller than a specific threshold value, when a TTI length set for the terminal is larger than a specific value, the symbol allocation information area described above may be included in the DL assignment DCI and/or UL assignment DCI for the corresponding terminal. Conversely, for any NR terminal operating based on the SCS value smaller than the specific threshold value, when the TTI

length set for the corresponding terminal is smaller than a specific value, or for any NR terminal operating based on an SCS value larger than a specific threshold value, the symbol allocation information area described above may be included in the DL assignment DCI and/or UL assignment DCI for the corresponding terminal.

[0067] FIG. 3 is a diagram showing a configuration of a base station 1000 according to another embodiment.

[0068] Referring to FIG. 3, the base station 1000 according to the other embodiment includes a controller 1010, a transmitter 1020, and a receiver 1030.

[0069] The controller 1010 controls the overall operation of the base station 1000 by configuring symbol allocation information for data resource allocation in the next-generation wireless access network according to the present invention described above.

[0070] The transmitter 1020 and the receiver 1030 are used to transmit and receive signals, messages, and data necessary for carrying out the present invention described above with the terminal.

[0071] FIG. 4 is a diagram showing a configuration of a user equipment 1100 according to another embodiment.

[0072] Referring to FIG. 4, a user equipment 1100 according to another embodiment includes a receiver 1110, a controller 1120, and a transmitter 1130.

[0073] The receiver 1110 receives downlink control information, data, and messages from the base station through a corresponding channel.

[0074] In addition, the controller 1120 controls the overall operation of the user equipment 1100 by acquiring symbol allocation information in DCI in the next-generation wireless access network according to the present invention described above.

[0075] The transmitter 1130 transmits uplink control information, data, and messages to the base station through a corresponding channel.

[0076] The standard contents or standard documents mentioned in the above-described embodiments are omitted to simplify the description of the specification and constitute a part of the present specification. Therefore, adding some of the contents of the above standard contents and standard documents to the present

specification or describing them in claims should be interpreted as falling within the scope of the present invention.

[0077] The above description is merely illustrative of the technical idea of the present invention, and those of ordinary skill in the art to which the present invention pertains will be able to make various modifications and variations without departing from the essential characteristics of the present invention. Accordingly, the embodiments disclosed in the present invention are not intended to limit the technical idea of the present invention, but to explain the technical idea, and the scope of the technical idea of the present invention is not limited by these embodiments. The scope of protection of the present invention should be interpreted by the accompanying claims, and all technical ideas within the scope equivalent thereto should be construed as being included in the scope of the present invention.

CLAIMS

1. A method of allocating data channel resources for a next-generation wireless access network, the method comprising:

 configuring bitmap-based symbol allocation information for all symbols constituting a transmission time interval (TTI) set for a terminal;

 transmitting the symbol allocation information by including the symbol allocation information in an uplink/downlink data assignment downlink control information (DCI); and

 acquiring the symbol allocation information within a slot allocated for uplink/downlink data transmission and reception.

[ABSTRACT]

[SUMMARY]

The present invention suggests a method of allocating data channel resources for a data channel for a next-generation/5G wireless access network (New Radio (NR)) that has been discussed in 3GPP. In particular, the present invention suggests a method of efficient allocating data channel resources for transmission and reception of eMBB and URLLC data with different requirements under discussion in NR, and specifically, suggests a downlink control information (DCI) configuration method for supporting a method of transmitting and receiving URLLC data based on short TTI length and eMBB data based on long TTI length by multiplexing the data with TDM within a given frequency resource in NR.

[REPRESENTATIVE FIGURE]

FIG. 1

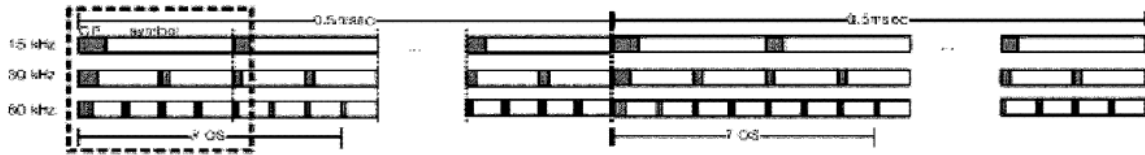


FIG. 2

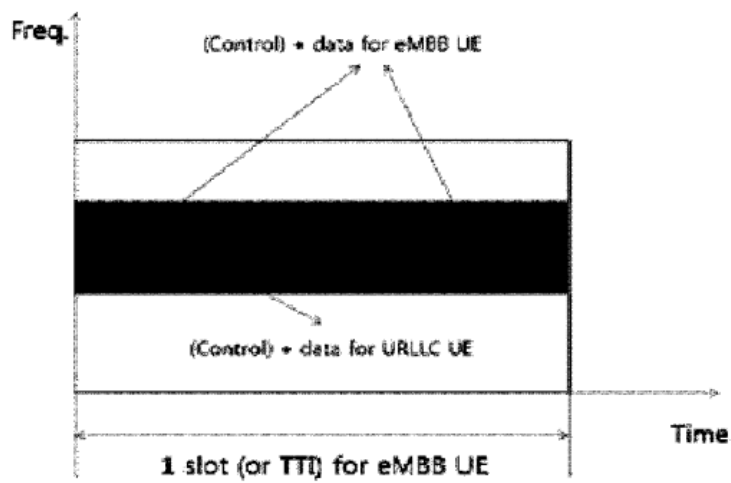


FIG. 3

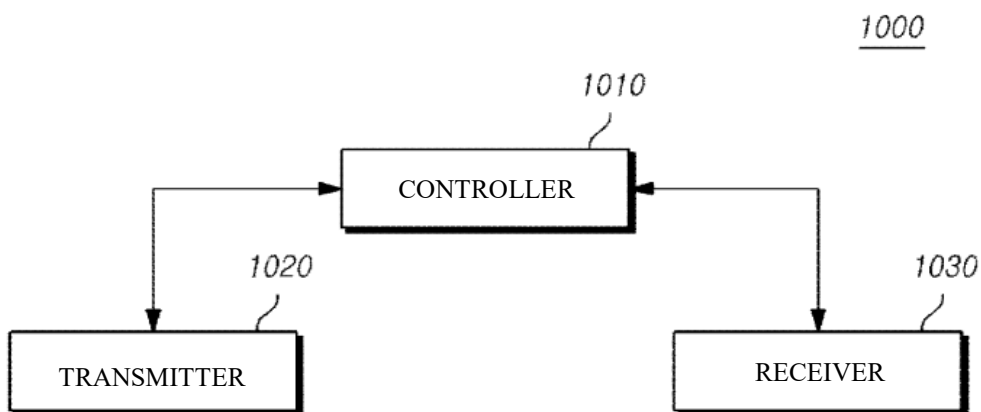


FIG. 4

