solve the problem of how the UE repeatedly transmits the uplink data to the base station in the EDT technology. In a method of transmitting data, the base station may send repetition-number-indicating information to the UE through a target random access response, and the UE may determine a target transmission repetition number based on the repetition-number-indicating information and a target transmission block size (TBS, as known as transport block size). In some embodiments, the target transmission repetition number indicates a number of times the UE is configured to repeatedly transmit target uplink data to the base station, with the target uplink data being transmitted by the UE during the random access procedure, and the UE transmitting the target uplink data to the base station in the target TBS. Then, the UE may transmit the target uplink data to the base station during the random access procedure in accordance with the target transmission repetition number, so as to realize that the UE repeatedly transmits the uplink data in the EDT technology.

[00121] An implementation environment of the methods of transmitting data according to embodiments of the present disclosure will be described as below.

[00122] FIG. 1 is a schematic diagram illustrating the implementation environment of the methods of transmitting data according to examples of the present disclosure. As shown in FIG. 1, there may be a base station 10 and a UE 20 included in the implementation environment. The UE 20 is any one of UEs in a cell served by the base station 10. The base station 10 and the UE 20 may perform a data transmission based on an NB-IoT communication protocol or an MTC communication protocol.

[00123] Fig. 2 is a flow chart illustrating a method of transmitting data according to an example. As shown in Fig. 2, the method of transmitting data is applicable to the UE 20 shown in Fig. 1, and includes the following steps.

[00124] At step 201, the UE sends a target random access preamble to the base station.

[00125] The target random access preamble indicates that the UE requests to transmit target uplink data to the base station during a random access procedure. In other words, the target random access preamble indicates that the UE is configured to utilize the EDT technology to transmit the target uplink data to the base station.

[00126] At step 202, the UE receives a target random access response, which is sent by the base station based on the target random access preamble and carries repetition-number-indicating information.

[00127] At step 203, the UE transmits the target uplink data to the base station during the random access procedure in accordance with a target transmission repetition number.

[00128] In some embodiments, the target transmission repetition number indicates a number of times the UE is configured to repeatedly transmit the target uplink data to the base station

the UE may include a first correspondence and a second correspondence. In particular, the first correspondence includes the first TBS and a first transmission repetition number that correspond to each other, and the second correspondence includes the second TBS and number-indicating information that correspond to each other. The number-indicating information indicates a relative relationship of a second transmission repetition number corresponding to the second TBS with respect to the first transmission repetition number. In one or more embodiments, the relative relationship of the second transmission repetition number with respect to the first transmission repetition number refers to a difference between the second transmission repetition number and the first transmission repetition number.

[00169] For example, for the 4 correspondences included in the set of correspondences 1 shown in Table ~~2~~ 3 above, TBS1 — rep_11 may be the first correspondence, and TBS2 — rep_21, TBS3 — rep_31 and TBS4 — rep_41 may be the second correspondence. In the first correspondence, rep_11 is the transmission repetition number corresponding to TBS1 and is an absolute value. In the second correspondence, however, rep_21, rep_31, and rep_41, as the number-indicating information, indicate the difference between the transmission repetition number corresponding to TBS2 and rep_11, the difference between the transmission repetition number corresponding to TBS3 and rep_11, and the difference between the transmission repetition number corresponding to TBS4 and rep_11, respectively.

[00170] For the at least one set of correspondences sent by the base station through the high-layer signaling, the UE may store it locally upon receiving it.

[00171] After receiving the target random access preamble sent by the UE, the base station may generate the repetition-number-indicating information based on the quality of the current channel, and send it to the UE through the target random access response. The repetition-number-indicating information may indicate one set of correspondences, i.e., the target set of correspondences, in the at least one set of correspondences.

[00172] After receiving the target random access response, the UE may extract the repetition-number-indicating information from the target random access response. Then, the UE may determine the target set of correspondences based on the repetition-number-indicating information, query the target set of correspondences based on the target TBS to obtain the transmission repetition number corresponding to the target TBS, and determine the transmission repetition number as the target transmission repetition number.

[00173] For example, the target set of correspondences indicated by the repetition-number-indicating information sent by the base station through the target random access response is the set of correspondences 1 shown in Table ~~2~~3, and the UE has determined

[00181] In one or more embodiments, the relative relationship of the target TBS with respect to the third TBS may be a proportional relationship of the target TBS with respect to the third TBS, and the first relative relationship may be a proportional relationship of the target transmission repetition number with respect to the third transmission repetition number.

[00182] In this implementation, the target transmission repetition number is associated with a formula *rep_x*(TBS_y/TBS_x)*. In a specific embodiment, the UE may calculate the target transmission repetition number based on a first formula that is:

$$rep_y = ceil[rep_x * (TBS_y / TBS_x)] ;$$

where rep_y is the target transmission repetition number, $ceil$ is a ceiling operator, rep_x is the third transmission repetition number, TBS_y is the target TBS, and TBS_x is the third TBS.

[00183] In the second possible implementation, the UE may determine a second relative relationship of a reference transmission repetition number with respect to the third transmission repetition number based on the relative relationship of the target TBS with respect to the third TBS. Then, the UE may determine the reference transmission repetition number based on the second relative relationship and the third transmission repetition number, and determine the target transmission repetition number based on the reference transmission repetition number.

[00184] In one or more embodiments, the relative relationship of the target TBS with respect to the third TBS may be a proportional relationship of the target TBS with respect to the third TBS, and the second relative relationship may be a proportional relationship of the reference transmission repetition number with respect to the third transmission repetition number.

[00185] In this implementation, the reference transmission repetition number is associated with the formula *rep_x*(TBS_y/TBS_x)*. In a specific embodiment, the UE may calculate the reference transmission repetition number based on a second formula that is:

$$rep_z = ceil[rep_x * (TBS_y / TBS_x)] ;$$

where rep_z is the reference transmission repetition number, $ceil$ is a ceiling operator, rep_x is the third transmission repetition number, TBS_y is the target TBS, and TBS_x is the third TBS.

[00186] According to the embodiments of the present disclosure, two possible implementations are provided for the UE to determine the target transmission repetition number based on the reference transmission repetition number.

[00187] In the first possible implementation, the UE determines the target transmission repetition number based on the reference transmission repetition number. The target transmission

repetition number is of a value, among a target set of values, that has a minimum difference from the reference transmission repetition number. In an optional embodiment, the minimum difference may be configured to be a positive value or an absolute value. For instance, when it's configured that the minimum difference is the positive value, the target transmission repetition number is of a value, among the target set of values, which is larger than the reference transmission repetition number and has the minimum difference value from the reference transmission repetition number. The target set of values includes at least one value and each value included in the target set of values is an integer multiple of a first preset value or an integer power of a second preset value.

[00188] In one or more embodiments, the first preset value and the second preset value may be identical or different. In one or more embodiments of the present disclosure, both the first preset value and the second preset value may be 2.

[00189] In the second possible implementation, the UE determines the target transmission repetition number based on the reference transmission repetition number. The target transmission repetition number is one of the transmission repetition numbers supported by the communication protocol, which has a minimum difference from the reference transmission repetition number. In an optional embodiment, the minimum difference may be configured to be a positive value or an absolute value. For instance, when it's configured that the minimum difference is the positive value, the target transmission repetition number is one of the transmission repetition numbers supported by the communication protocol, which is larger than the reference transmission repetition number and has the minimum difference value from the reference transmission repetition number.

[00190] At step 406, the UE transmits the target uplink data to the base station during the random access procedure in accordance with the target transmission repetition number.

[00191] In the EDT technology, the UE may transmit the target uplink data to the base station through Message 3 of the random access procedure.

[00192] The UE may modulate and code the target uplink data in accordance with the modulation and coding scheme that is determined by itself based on the number of RUs indicated by the uplink-resource-indicating information and the target TBS, and then repeatedly transmit the modulated and encoded target uplink data to the base station. Particularly, the number of times the UE is configured to repeatedly transmit the modulated and coded target uplink data to the base station is indicated by the target transmission repetition number.

[00193] At step 407, during the random access procedure, the base station receives the target uplink data that is transmitted by the UE in accordance with the target transmission repetition

number.

[00194] For the step 407, since the base station cannot know in advance the target TBS selected by the UE, the base station may test the uplink resource carrying the target uplink data with available TBSs sequentially until obtaining a TBS in which the target uplink data is capable of being correctly received, i.e., the target TBS.

[00195] The base station may determine the target transmission repetition number based on the target TBS and the repetition-number-indicating information, and receive, in accordance with the target transmission repetition number, the target uplink data transmitted by the UE.

[00196] The present disclosure also provides a method for transmitting data, being applicable to a UE, comprising:

sending a target random access preamble to a base station to indicate that the UE requests to transmit target uplink data to the base station during a random access procedure;

receiving a target random access response associated with the target random access preamble from the base station, where the target random access response carries repetition-number-indicating information, and where the repetition-number-indicating information indicates a third transmission repetition number corresponding to a third TBS;

determining a reference transmission repetition number based on a target TBS, the third TBS and the third transmission repetition number, where the reference transmission repetition number is associated with a formula: *rep_x*(TBS_y/TBS_x)*, with rep_x being the third transmission repetition number, TBS_y being the target TBS, and TBS_x being the third TBS, and where the target TBS is for the UE to transmit the target uplink data to the base station during the random access procedure;

determining a target transmission repetition number based on the reference transmission repetition number, where the target transmission repetition number indicates a number of times the UE is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and where the target transmission repetition number is of a value, among a target set of values, which is larger than the reference transmission repetition number and has the minimum difference value from the reference transmission repetition number; and

transmitting, in accordance with the target transmission repetition number, the target uplink data to the base station during the random access procedure.

[00197] In one embodiment, the target set of values includes at least one value and each value included in the target set of values is an integer multiple of a first preset value or an integer power of a second preset value.

[00198] The present disclosure further provides a method for transmitting data, being applicable to a base station, comprising:

receiving a target random access preamble from a use equipment, where the target random access preamble indicates that a UE requests to transmit target uplink data to the base station during a random access procedure;

sending a target random access response associated with the target random access preamble to the UE,

where the target random access response carries repetition-number-indicating information, and the repetition-number-indicating information indicates a third transmission repetition number corresponding to a third TBS,

where the third TBS and the third transmission repetition number, in combination with a target TBS, are for the UE to determine a reference transmission repetition number, and the target TBS is for the UE to transmit the target uplink data to the base station during the random access procedure,

where the reference transmission repetition number is associated with a formula: *rep_x*(TBS_y/TBS_x)*, with rep_x being the third transmission repetition number, TBS_y being the target TBS, and TBS_x being the third TBS, and

where the reference transmission repetition number is for the UE to determine a target transmission repetition number, the target transmission repetition number indicates a number of times the UE is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and the target transmission repetition number is of a value, among a target set of values, which is larger than the reference transmission repetition number and has the minimum difference value from the reference transmission repetition number; and

receiving, during the random access procedure, the target uplink data that is transmitted by the user equipment in accordance with the target transmission repetition number.

[00199] In one embodiment, the target set of values includes at least one value and each value included in the target set of values is an integer multiple of a first preset value or an integer power of a second preset value.

~~[00196]~~**[00200]** From the foregoing description, according to the method of transmitting data provided by the embodiments of the present disclosure, by receiving repetition-number-indicating information carried in a target random access response sent by a base station, and transmitting, in accordance with a target transmission repetition number, target uplink data to the base station during a random access procedure, where the target transmission repetition number is

determined based on the repetition-number-indicating information and a target TBS, a UE in the EDT technology can repeatedly transmit the target uplink data to the base station, thereby solving the problem of how the UE repeatedly transmits uplink data to the base station in the EDT technology.

~~[00197]~~[00201] Fig. 5 is a block diagram illustrating an apparatus 500 for transmitting data according to an example. The apparatus 500 for transmitting data may be installed in the UE 20 shown in Fig. 1. Referring to FIG. 5, the apparatus 500 for transmitting data includes a first sending module 501, a receiving module 502 and a second sending module 503.

~~[00198]~~[00202] The first sending module 501 is configured to send a target random access preamble to a base station to indicate that the UE requests to transmit target uplink data to the base station during a random access procedure.

~~[00199]~~[00203] The receiving module 502 is configured to receive a target random access response. The target random access response is sent by the base station based on the target random access preamble and carries repetition-number-indicating information.

~~[00200]~~[00204] The second sending module 503 is configured to transmit the target uplink data to the base station during the random access procedure in accordance with a target transmission repetition number.

~~[00201]~~[00205] In some embodiments, the target transmission repetition number indicates a number of times the UE is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and the target transmission repetition number is determined based on the repetition-number-indicating information and a target TBS. The target TBS is for the UE to transmit the target uplink data to the base station during the random access procedure.

~~[00202]~~[00206] In one or more embodiments of the present disclosure, the repetition-number-indicating information is carried in an uplink scheduling grant for the target random access response.

~~[00203]~~[00207] As shown in FIG. 6, according to an embodiment of the present disclosure, there is provided another apparatus 600 for transmitting data. In addition to the modules included by the apparatus 500 for transmitting data, the apparatus 600 for transmitting data includes a first number-determining module 504.

~~[00204]~~[00208] As shown in FIG. 7, according to an embodiment of the present disclosure, there is provided another apparatus 700 for transmitting data. In addition to the modules included by the apparatus 500 for transmitting data, the apparatus 700 for transmitting data includes a

second number-determining module 505.

~~[00205]~~[00209] Here, on the basis of the modules included by the apparatus 500 for transmitting data, the apparatus for transmitting data according to the embodiments of the present disclosure may include the first number-determining module 504 and the second number-determining module 505 at the same time.

~~[00206]~~[00210] In one or more embodiments of the present disclosure, at least one set of correspondences is stored in the UE. Each of the at least one set of correspondences includes at least one correspondence between TBS and transmission repetition number. The first number-determining module 504 includes:

~~[00207]~~[00211] a set-determining submodule that is configured to determine a target set of correspondences from the at least one set of correspondences based on the repetition-number-indicating information;

~~[00208]~~[00212] a querying submodule that is configured to query the target set of correspondences based on the target TBS to obtain the transmission repetition number corresponding to the target TBS; and

~~[00209]~~[00213] a first number-determining submodule that is configured to determine the transmission repetition number corresponding to the target TBS as the target transmission repetition number.

~~[00210]~~[00214] In one or more embodiments of the present disclosure, the at least one set of correspondences is sent by the base station to the UE through high-layer signaling.

~~[00211]~~[00215] In one or more embodiments of the present disclosure, the set of correspondences includes a first correspondence between the first TBS and a first transmission repetition number that correspond to each other, and a second correspondence between the second TBS and number-indicating information that correspond to each other. The number-indicating information indicates a relative relationship of the second transmission repetition number corresponding to the second TBS with respect to the first transmission repetition number.

~~[00212]~~[00216] In one or more embodiments of the present disclosure, the repetition-number-indicating information indicates a third transmission repetition number corresponding to a third TBS. The second number-determining module 505 is configured to determine the target transmission repetition number based on the target TBS, the third TBS, and the third transmission repetition number.

~~[00213]~~[00217] In one or more embodiments of the present disclosure, the third transmission repetition number is included in a set of transmission repetition numbers. The set of

transmission repetition numbers includes at least one of transmission repetition numbers supported by a communication protocol and is sent by the base station to the UE through the high-layer signaling.

~~[00214]~~[00218] In one or more embodiments of the present disclosure, the second number-determining module 505 includes:

~~[00215]~~[00219] a first relationship-determining submodule that is configured to determine a first relative relationship of the target transmission repetition number with respect to the third transmission repetition number based on a relative relationship between the target TBS and the third TBS, with the first relative relationship being a relative relationship of the target transmission repetition number with respect to the third transmission repetition number; and

~~[00216]~~[00220] a second number-determining submodule that is configured to determine the target transmission repetition number based on the first relative relationship and the third transmission repetition number.

~~[00217]~~[00221] In one or more embodiments of the present disclosure, the second number-determining module 505 includes:

~~[00218]~~[00222] a second relationship-determining submodule that is configured to determine a second relative relationship of a reference transmission repetition number with respect to the third transmission repetition number based on the relative relationship of the target TBS with respect to the third TBS;

~~[00219]~~[00223] a third number-determining submodule that is configured to determine the reference transmission repetition number based on the second relative relationship and the third transmission repetition number; and

~~[00220]~~[00224] a fourth number-determining submodule that is configured to determine the target transmission repetition number based on the reference transmission repetition number.

~~[00221]~~[00225] In one or more embodiments of the present disclosure, the fourth number-determining submodule is specifically configured to determine, based on the reference transmission repetition number, the target transmission repetition number, which is of a value among a target set of values that has a minimum difference from the reference transmission repetition number. The target set of values includes at least one value, and each of the at least one value is an integer multiple of a first preset value or an integer power of a second preset value.

~~[00222]~~[00226] In one or more embodiments of the present disclosure, the fourth number-determining submodule is specifically configured to determine, based on the reference transmission repetition number, the target transmission repetition number, which is one of

transmission repetition numbers supported by the communication protocol that has a minimum difference from the reference transmission repetition number.

~~[00223]~~[00227] From the foregoing description, according to the apparatus for transmitting data provided by the embodiments of the present disclosure, by receiving repetition-number-indicating information carried in a target random access response sent by a base station, and transmitting, in accordance with a target transmission repetition number, target uplink data to the base station during a random access procedure, where the target transmission repetition number is determined based on the repetition-number-indicating information and a target TBS, a UE in the EDT technology can repeatedly transmit the target uplink data to the base station, thereby solving the problem of how the UE repeatedly transmits uplink data to the base station in the EDT technology.

~~[00224]~~[00228] Regarding the apparatus in the above embodiments, the specific manner in which each module performs its operation has been described in detail in the embodiments of the related method, and will not be repeated here.

~~[00225]~~[00229] Fig. 8 is a block diagram illustrating an apparatus 800 for transmitting data according to an example. The apparatus 800 for transmitting data may be installed in the base station 10 shown in Fig. 1. Referring to FIG. 8, the apparatus 800 for transmitting data includes a first receiving module 701, a sending module 702 and a second receiving module 703.

~~[00226]~~[00230] The first receiving module 701 is configured to receive a target random access preamble sent by a UE. The target random access preamble indicates that the UE requests to transmit target uplink data to the base station during a random access procedure.

~~[00227]~~[00231] The sending module 702 is configured to send a target random access response to the UE based on the target random access preamble. The target random access response carries repetition-number-indicating information for the UE to determine a target transmission repetition number based on the repetition-number-indicating information and a target TBS. The target transmission repetition number indicates a number of times the UE is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and the target TBS is for the UE to transmit the target uplink data to the base station during the random access procedure.

~~[00228]~~[00232] The second receiving module 703 is configured to receive, during the random access procedure, the target uplink data that is transmitted by the UE in accordance with the target transmission repetition number.

~~[00229]~~[00233] In one or more embodiments of the present disclosure, the repetition-

number-indicating information is configured to instruct the UE to determine a target set of correspondences from at least one set of correspondences stored in the UE. The target set of correspondences is for the UE to query based on the target TBS, to obtain and determine a transmission repetition number corresponding to the target TBS as the target transmission repetition number.

~~[00230]~~[00234] In one or more embodiments, each of the at least one set of correspondences includes at least one correspondence between TBS and transmission repetition number.

~~[00231]~~[00235] In one or more embodiments of the present disclosure, the at least one set of correspondences is sent by the base station to the UE through high-layer signaling.

~~[00232]~~[00236] In one or more embodiments of the present disclosure, the set of correspondences includes a first correspondence between a first TBS and a first transmission repetition number that correspond to each other, and a second correspondence between a second TBS and number-indicating information that correspond to each other. The number-indicating information indicates a relative relationship of a second transmission repetition number corresponding to the second TBS with respect to the first transmission repetition number.

~~[00233]~~[00237] In one or more embodiments of the present disclosure, the repetition-number-indicating information indicates a third transmission repetition number. The third transmission repetition number corresponds to a third TBS. The third transmission repetition number and the third TBS, in combination with the target TBS, are for the UE to determine the target transmission repetition number.

~~[00234]~~[00238] In one or more embodiments of the present disclosure, the third transmission repetition number is included in a set of transmission repetition numbers. The set of transmission repetition numbers includes at least one of transmission repetition numbers supported by a communication protocol and is sent by the base station to the UE through the high-layer signaling.

~~[00235]~~[00239] In one or more embodiments of the present disclosure, the repetition-number-indicating information is carried in an uplink scheduling grant for the target random access response.

~~[00236]~~[00240] From the foregoing description, according to the apparatus of transmitting data provided by the embodiments of the present disclosure, by sending repetition-number-indicating information carried in a target random access response to a UE, the UE can transmits, in accordance with a target transmission repetition number, target uplink data to a base station during a random access procedure, where the target transmission repetition number is determined

based on the repetition-number-indicating information and a target TBS by the UE, so that the UE in the EDT technology can repeatedly transmit the target uplink data to the base station, thereby solving the problem of how the UE repeatedly transmits uplink data to the base station in the EDT technology.

~~[00237]~~[00241] Regarding the apparatus in the above embodiments, the specific manner in which each module performs its operation has been described in detail in the embodiments of the related method, and will not be repeated here.

~~[00238]~~[00242] FIG. 9 is a block diagram illustrating a device 900 for transmitting data according to an example. For example, the device 900 may be a terminal supporting an Internet of things communication based on the NB-IoT or the MTC, such as an intelligent watt-hour meter, a shared bicycle, an intelligent TV, an intelligent air conditioner, an intelligent temperature collector, or an intelligent humidity collecting component.

~~[00239]~~[00243] As shown in FIG. 9, the device 900 may include one or more of the following components: a processing component 802, a memory 804, a power supply component 806, a multimedia component 808, an audio component 810, an input/output (I/O) interface 812, a sensor component 814, and a communication component 816.

~~[00240]~~[00244] The processing component 802 generally controls the overall operations of the device 900, such as operations associated with display, phone calls, data communications, camera operations, and recording operations. The processing element 802 may include one or more processors 820 to execute instructions to complete all or part of the steps operated by the UE 20 in the above method embodiments. Moreover, processing component 802 may include one or more modules to facilitate interaction between the processing component 802 and other components. For example, the processing component 802 may include a multimedia module to facilitate the interaction between the multimedia component 808 and the processing component 802.

~~[00241]~~[00245] The memory 804 is configured to store various types of data to support the operation of the device 900. Examples of such data include instructions for any application or method operated on the device 900, contact data, phonebook data, messages, pictures, videos, and the like. The memory 804 may be implemented by any type of volatile or non-volatile storage device or a combination thereof, such as static random access memory (SRAM), electrically erasable programmable read only memory (EEPROM), erasable programmable Read Only Memory (EPROM), programmable Read Only Memory (PROM), Read Only Memory (ROM), Magnetic Memory, Flash Memory, Disk or Optical Disk.

~~[00242]~~[00246] The power supply component 806 provides power to different components

of the device 900. The power supply component 806 may include a power management system, one or more power supplies, and other components associated with generating, managing, and distributing power for the device 900.

~~[00243]~~[00247] The multimedia component 808 includes a screen providing an output interface between the device 900 and a user. In some embodiments, the screen may include a liquid crystal display (LCD) and a touch panel (TP). If the screen includes the TP, the screen may be implemented as a touch screen to receive input signals from the user. The TP may include one or more touch sensors to sense touches, swipes, and gestures on the TP. The touch sensors may not only sense a boundary of a touch or swipe, but also sense a lasting time and a pressure associated with the touch or swipe. In some embodiments, the multimedia component 808 includes a front camera and/or a rear camera. The front camera and/or rear camera may receive external multimedia data when the device 900 is in an operating mode, such as a photographing mode or a video mode. Each front camera and rear camera may be a fixed optical lens system or have focal length and optical zooming capability.

~~[00244]~~[00248] The audio component 810 is configured to output and/or input an audio signal. For example, the audio component 810 includes a microphone (MIC) that is configured to receive an external audio signal when the device 900 is in an operating mode, such as a call mode, a recording mode, and a voice recognition mode. The received audio signal may be further stored in memory 804 or transmitted via communication component 816. In some embodiments, the audio component 810 also includes a speaker for outputting an audio signal.

~~[00245]~~[00249] The I/O interface 812 provides an interface between the processing component 802 and a peripheral interface module. The above peripheral interface module may be a keyboard, a click wheel, buttons, or the like. These buttons may include but not limited to, a home button, a volume button, a start button and a lock button.

~~[00246]~~[00250] The sensor component 814 includes one or more sensors to provide the device 900 with status assessments in various aspects. For example, the sensor component 814 may detect an open/closed state of the device 900 and a relative positioning of components such as the display and keypad of the device 900, and the sensor component 814 may also detect a change in position of the device 900 or a component of the device 900, the presence or absence of user contact with the device 900, orientation or acceleration/deceleration of the device 900, and temperature change of the device 900. The sensor component 814 may include a proximity sensor configured to detect the presence of a nearby object without any physical contact. The sensor component 814 may further include an optical sensor, such as a Complementary Metal-Oxide-

Semiconductor (CMOS) or Charged Coupled Device (CCD) image sensor which is used in imaging applications. In some embodiments, the sensor component 814 may also include an acceleration sensor, a gyro sensor, a magnetic sensor, a pressure sensor, or a temperature sensor.

~~[00247]~~[00251] The communication component 816 is configured to facilitate wired or wireless communication between the device 900 and other devices. The device 900 may access a wireless network based on a communication standard, such as WiFi, 2G or 3G, or a combination thereof. In an example, the communication component 816 receives a broadcast signal or broadcast-associated information from an external broadcast management system via a broadcast channel. In an exemplary embodiment, the communication component 816 also includes a near field communication (NFC) module to facilitate short range communication. For example, the NFC module may be implemented based on radio frequency identification (RFID) technology, infrared data association (IrDA) technology, ultra-wideband (UWB) technology, Bluetooth (BT) technology, and other technologies.

~~[00248]~~[00252] In an exemplary embodiment, the device 900 may be implemented by one or more Application Specific Integrated Circuits (ASICs), Digital Signal Processors (DSPs), Digital Signal Processing Devices (DSPDs), programmable Logic Devices (PLDs), Field Programmable Gate Arrays (FPGAs), controllers, microcontrollers, microprocessors, or other electronic components for performing the technical process operated by the UE 20 in the above method embodiments.

~~[00249]~~[00253] In an exemplary embodiment, there is also provided a non-transitory computer-readable storage medium including instructions, such as the memory 804 including instructions. The above instructions may be executed by the processor 820 of the device 900 to implement the technical process operated by the UE 20 in the above method embodiments. For example, the non-transitory computer-readable storage medium may be a Read-Only Memory (ROM), a Random Access Memory (RAM), a CD-ROM, a magnetic tape, a floppy disk, an optical data storage device, and the like.

~~[00250]~~[00254] FIG. 10 is a block diagram illustrating a device 1000 for transmitting data according to an example. For example, the device 1000 for transmitting data may be a base station. As shown in FIG. 10, the device 1000 for transmitting data may include: a processor 901, a receiver 902, a transmitter 903, and a memory 904. The receiver 902, the transmitter 903 and the memory 904 are connected to the processor 901 separately through a bus.

~~[00251]~~[00255] In one or more embodiments, the processor 901 includes one or more processing cores, and runs software programs and modules to perform the methods operated by

the base station according to the methods of transmitting data provided by the embodiment of the present disclosure. The memory 904 may store the software programs and the modules. Specifically, the memory 904 may store an operating system 9041 and an application module 9042 meeting at least one function. The receiver 902 receives communication data transmitted by another device, and the transmitter 903 transmits communication data to another device.

~~[00252]~~[00256] Fig. 11 is a block diagram illustrating a system 1100 for transmitting data according to an example. As shown in Fig. 11, the system 1100 for transmitting data includes a base station 1001 and a UE 1002.

~~[00253]~~[00257] The base station 1001 is configured to execute the method of transmitting data operated by the base station according to the embodiment shown in FIG. 4.

~~[00254]~~[00258] The UE 1002 is configured to perform the method of transmitting data operated by the UE according to the embodiment shown in FIG. 4.

~~[00255]~~[00259] According to an example, there is also provided a computer-readable storage medium. The computer-readable storage medium is a non-volatile computer-readable storage medium in which a computer program is stored, and when the stored computer program is executed by the processing component, the methods of transmitting data provided by the foregoing embodiments of the present disclosure can be implemented.

~~[00256]~~[00260] According to an example, there is also provided a computer program product. The computer program product stores instructions, and when running on a computer, causes the computer to execute the methods of transmitting data provided by the embodiments of the present disclosure.

~~[00257]~~[00261] According to an example, there is also provided a chip. The chip includes a programmable logic circuit and/or program instructions, and when running, can execute the methods of transmitting data provided by the embodiments of the present disclosure.

~~[00258]~~[00262] Other implementations of the present disclosure will be readily apparent to those skilled in the art after implementing the disclosure by referring to the specification. The present application is intended to cover any variations, uses, or adaptations of the present disclosure that are in accordance with the general principles thereof and include common general knowledge or conventional technical means in the art that are not disclosed in the present disclosure. The specification and embodiments therein are only illustrative, and the scope and spirit of the present disclosure are to be indicated by appended claims.

~~[00259]~~[00263] It should be understood that the present disclosure is not limited to the above described accurate structures shown in the drawings, and various modifications and changes can

be made to the present disclosure without departing from the scope thereof. The scope of the present disclosure is to be limited only by the appended claims.

CLAIMS

1. A method of transmitting data, being applicable to a user equipment, comprising:

sending, to a base station, a target random access preamble that indicates that athe user equipment requests to transmit target uplink data to the base station during a random access procedure;

receiving a target random access response that is sent by the base station based on the target random access preamble and carries repetition-number-indicating information which indicates a third transmission repetition number selected from a set of transmission repetition numbers, wherein the set of transmission repetition numbers is determined based on a quality of a current channel; and

determining a target transmission repetition number based on a target transmission block size, a third transmission block size, and a third transmission repetition number; wherein the third transmission repetition number corresponds to the third transmission block size;

transmitting, in accordance with athe target transmission repetition number, the target uplink data to the base station during the random access procedure;

wherein the target transmission repetition number indicates a number of times the user equipment is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and

~~wherein the target transmission repetition number is determined based on the repetition-number-indicating information and a target transmission block size, and~~

wherein the target transmission block size is for the user equipment to transmit the target uplink data to the base station during the random access procedure.

~~2. The method according to claim 1, wherein at least one set of correspondences is stored in the user equipment and each of the at least one set of correspondences comprises at least one correspondence between transmission block size and transmission repetition number; and before transmitting the target uplink data to the base station during the random access procedure in accordance with the target transmission repetition number, the method further comprises:~~

~~determining a target set of correspondences from the at least one set of correspondences based on the repetition-number-indicating information;~~

~~querying the target set of correspondences based on the target transmission block size to obtain the transmission repetition number corresponding to the target transmission block size; and~~

~~determining the transmission repetition number corresponding to the target transmission block size as the target transmission repetition number.~~

~~3. The method according to claim 2, wherein the at least one set of correspondences is sent by the base station to the user equipment through high-layer signaling.~~

~~4. The method according to claim 2, wherein the set of correspondences comprises:~~

~~a first correspondence between a first transmission block size and a first transmission repetition number that correspond to each other, and~~

~~a second correspondence between a second transmission block size and number-indicating information that correspond to each other,~~

~~wherein the number-indicating information indicates a relative relationship of a second transmission repetition number corresponding to the second transmission block size with respect to the first transmission repetition number.~~

~~5. The method according to claim 1, wherein the repetition number-indicating information indicates a third transmission repetition number corresponding to a third transmission block size; and before transmitting the target uplink data to the base station during the random access procedure in accordance with the target transmission repetition number, the method further comprises:~~

~~determining the target transmission repetition number based on the target transmission block size, the third transmission block size, and the third transmission repetition number.~~

~~6~~2. The method according to claim ~~5~~1,

~~wherein the third transmission repetition number is comprised in a set of transmission repetition numbers, and~~

wherein the set of transmission repetition numbers comprises at least one of transmission repetition numbers supported by a communication protocol and is sent by the base station to the user equipment through high-layer signaling.

~~7~~3. The method according to claim ~~5~~2, wherein the set of transmission repetition numbers comprises a transmission block size corresponding to each of the transmission repetition numbers respectively.

4. The method according to claim 2, further comprising:

storing the set of transmission repetition numbers locally upon receiving the set of transmission repetition numbers.

5. The method according to claim 1, wherein determining the target transmission repetition number based on the target transmission block size, the third transmission block size, and the third transmission repetition number comprises:

determining a first relative relationship of the target transmission repetition number with respect to the third transmission repetition number based on a relative relationship of the target transmission block size with respect to the third transmission block size; and

determining the target transmission repetition number based on the first relative relationship and the third transmission repetition number.

~~8~~6. The method according to claim ~~5~~1, wherein determining the target transmission repetition number based on the target transmission block size, the third transmission block size, and the third transmission repetition number comprises:

determining a second relative relationship of a reference transmission repetition number with respect to the third transmission repetition number based on a relative relationship of the target transmission block size with respect to the third transmission block size;

determining the reference transmission repetition number based on the second relative relationship and the third transmission repetition number; and

determining the target transmission repetition number based on the reference transmission repetition number.

~~9~~7. The method according to claim ~~8~~6, wherein determining the target transmission repetition number based on the reference transmission repetition number comprises:

determining, based on the reference transmission repetition number, the target transmission repetition number, wherein the target transmission repetition number is a value that has a minimum difference from the reference transmission repetition number among a target set of values,

wherein the target set of values comprises at least one value, and each of the at least one value is an integer multiple of a first preset value or an integer power of a second preset value.

~~10~~8. The method according to claim ~~8~~6, wherein determining the target transmission repetition number based on the reference transmission repetition number comprises:

determining, based on the reference transmission repetition number, the target transmission repetition number, wherein the target transmission repetition number is one of transmission repetition numbers supported by a communication protocol that has a minimum difference from the reference transmission repetition number.

~~11~~9. The method according to any one of claims 1 to ~~10~~8, wherein the repetition-number-indicating information is carried in an uplink scheduling grant for the target random access response.

~~12~~10. A method of transmitting data, being applicable to a base station, comprising:

receiving a target random access preamble sent by a user equipment, wherein the target random access preamble indicates that the user equipment requests to transmit target uplink data to ~~a~~the base station during a random access procedure;

selecting a third transmission repetition number selected from a set of transmission repetition numbers; wherein the set of transmission repetition numbers is determined based on a quality of a current channel;

generating repetition-number-indicating information for indicating the third transmission repetition number;

sending, based on the target random access preamble, a target random access response to the user equipment,

wherein the target random access response carries the repetition-number-indicating information for the user equipment to determine a target transmission repetition number based on ~~the repetition-number-indicating information and~~ a target transmission block size, a third transmission block size, and the third transmission repetition number, wherein the third transmission repetition number corresponds to the third transmission block size,

wherein the target transmission repetition number indicates a number of times the user equipment is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and

wherein the target transmission block size is for the user equipment to transmit the target uplink data to the base station during the random access procedure; and

receiving, during the random access procedure, the target uplink data that is transmitted by the user equipment in accordance with the target transmission repetition number.

~~13. The method according to claim 12, wherein the repetition-number-indicating information is configured to instruct the user equipment to determine a target set of correspondences from at least one set of correspondences stored in the user equipment, and the target set of correspondences is for the user equipment to query based on the target transmission block size to obtain and determine a transmission repetition number corresponding to the target transmission block size as the target transmission repetition number;~~

~~wherein each of the at least one set of correspondences comprises at least one correspondence between transmission block size and transmission repetition number.~~

~~14. The method according to claim 13, wherein the at least one set of correspondences is sent by the base station to the user equipment through high-layer signaling.~~

~~15. The method according to claim 13, wherein the set of correspondences comprises:~~

~~a first correspondence between a first transmission block size and a first transmission repetition number that correspond to each other, and~~

~~a second correspondence between a second transmission block size and number-indicating information that correspond to each other,~~

~~wherein the number-indicating information indicates a relative relationship of a second transmission repetition number corresponding to the second transmission block size with respect to the first transmission repetition number.~~

~~16. The method according to claim 12,~~

~~wherein the repetition-number-indicating information indicates a third transmission repetition number corresponding to a third transmission block size, and~~

~~wherein the third transmission repetition number and the third transmission block size, in combination with the target transmission block size, are for the user equipment to determine the target transmission repetition number.~~

~~17~~11. The method according to claim ~~16~~10,

~~wherein the third transmission repetition number is comprised in a set of transmission repetition numbers, and~~

wherein the set of transmission repetition numbers comprises at least one of transmission repetition numbers supported by a communication protocol and is sent by the base station to the user equipment through high-layer signaling.

12. The method according to claim 11, wherein the set of transmission repetition numbers comprises a transmission block size corresponding to each of the transmission repetition numbers respectively.

13. The method according to claim 10, further comprising:

selecting the third transmission repetition number from the set of transmission repetition numbers after receiving the target random access preamble sent by the user equipment.

~~18~~14. The method according to any one of claims ~~12~~10 to ~~17~~13, wherein the repetition-number-indicating information is carried in an uplink scheduling grant for the target random access response.

~~19. An apparatus for transmitting data, comprising:~~

~~a first sending module, configured to send a target random access preamble to a base station, the target random access preamble indicating that a user equipment requests to transmit target uplink data to the base station during a random access procedure;~~

~~a receiving module, configured to receive a target random access response that is sent by the base station based on the target random access preamble and carries repetition-number-indicating information; and~~

~~a second sending module, configured to transmit, in accordance with a target transmission repetition number, the target uplink data to the base station during the random access procedure;~~

~~wherein the target transmission repetition number indicates a number of times the user equipment is configured to repeatedly transmit the target uplink data to the base station during the random access procedure,~~

~~wherein the target transmission repetition number is determined based on the repetition-number-indicating information and a target transmission block size, and~~

~~wherein the target transmission block size is for the user equipment to transmit the target uplink data to the base station during the random access procedure.~~

~~20. An apparatus for transmitting data, comprising:~~

~~a first receiving module, configured to receive a target random access preamble sent by a user equipment, wherein the target random access preamble indicates that the user equipment requests to transmit target uplink data to a base station during a random access procedure;~~

~~a sending module, configured to send, based on the target random access preamble, a target random access response to the user equipment,~~

~~wherein the target random access response carries repetition-number-indicating information for the user equipment to determine a target transmission repetition number based on the repetition-number-indicating information and a target transmission block size,~~

~~wherein the target transmission repetition number indicates a number of times the user equipment is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and~~

~~wherein the target transmission repetition number is for the user equipment to transmit the target uplink data to the base station during the random access procedure; and~~

~~a second receiving module, configured to receive, during the random access procedure, the target uplink data that is transmitted by the user equipment in accordance with the target transmission repetition number.~~

~~21~~15. A user equipment, comprising:

a processor; and

a memory for storing instructions executable by the processor;

wherein the processor is configured to~~:~~ perform the method according to any one of claims 1 to 9.

~~send a target random access preamble to a base station, the target random access preamble indicating that the user equipment requests to transmit target uplink data to the base station during a random access procedure;~~

~~receive a target random access response that is sent by the base station based on the target random access preamble and carries repetition-number-indicating information; and~~

~~transmit, in accordance with a target transmission repetition number, the target uplink data to the base station during the random access procedure;~~

~~wherein the target transmission repetition number indicates a number of times the user equipment is configured to repeatedly transmit the target uplink data to the base station during the random access procedure,~~

~~wherein the target transmission repetition number is determined based on the repetition-number-indicating information and a target transmission block size, and~~

~~wherein the target transmission block size is for the user equipment to transmit the target uplink data to the base station during the random access procedure.~~

~~22~~16. A base station, comprising:

a processor; and

a memory for storing instructions executable by the processor;

wherein the processor is configured to~~:~~ perform the method according to any one of claims 10 to 14.

~~receive a target random access preamble sent by a user equipment, wherein the target random access preamble indicates that the user equipment requests to transmit target uplink data to the base station during a random access procedure;~~

~~send, based on the target random access preamble, a target random access response to the user equipment,~~

~~wherein the target random access response carries repetition-number-indicating information for the user equipment to determine a target transmission repetition number based on the repetition-number-indicating information and a target transmission block size,~~

~~wherein the target transmission repetition number indicates a number of times the user equipment is configured to repeatedly transmit the target uplink data to the base station during the random access procedure, and~~

~~wherein the target transmission block size is for the user equipment to transmit the target uplink data to the base station during the random access procedure; and~~

~~receive, during the random access procedure, the target uplink data that is transmitted by the user equipment in accordance with the target transmission repetition number.~~

~~23. A system for transmitting data, comprising the apparatus for transmitting data according to claim 19 and the apparatus for transmitting data according to claim 20.~~

~~24. A computer-readable storage medium having a computer program stored thereon, wherein:~~

~~when the stored computer program is executed by a processing component, the method of transmitting data according to any one of claims 1 to 11 is implemented; or~~

~~when the stored computer program is executed by the processing component, the method of transmitting data according to any one of claims 12 to 18 is implemented.~~