

WIRELESS COMMUNICATION METHOD AND DEVICE

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TECHNICAL FIELD

The present disclosure relates to the field of communications, and more particularly to a wireless communication method and device.

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BACKGROUND

In an existing Long Term Evolution (LTE) system, along with constant increase of maximum capabilities supported by terminal devices, a network device may configure different function parameters according to different terminal capabilities to meet service requirements of users.

A terminal device supports a quite high capability. However, the terminal capability is achieved in ideal conditions, for example, in single-service and single-network conditions. It is difficult to achieve a maximum terminal capability in a practical network.

If the network device configures a terminal device according to the maximum capability of the terminal device, this may cause storage overflow, terminal overheating and the like, to further cause poor communication performance and damages to hardware of the terminal device.

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SUMMARY

Embodiments of the present disclosure provide a wireless communication method and device, which may improve communication performance and avoid damages to hardware of a terminal device.

A first aspect provides a wireless communication method, which may include the following operations.

A terminal device sends a first message to an access network device. The first message carries at least one of first capability information or first function parameter information, the first capability information is used for indicating the access network

device that a maximum communication capability of the terminal device is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device that a function parameter of the terminal device for communication is needed to be updated into a first function parameter, or that a value range of the function parameter of the terminal device for communication is needed to be updated into a first value.

The terminal device receives a second message from the access network device. The second message carries the function parameter or the value range of the function parameter configured for the terminal device by the access network device according to the at least one of the first capability information or the first function parameter information.

In combination with the first aspect, in a possible implementation of the first aspect, before the operation that the terminal device sends the first message to the access network device, the method may include that, the terminal device determine, according to a present condition of the terminal device, at least one: of the first communication capability, the first function parameter, or the first value range of the function parameter.

In combination with the first aspect or any abovementioned possible implementation thereof, in a possible implementation of the first aspect, the second message may be a reconfiguration message.

In combination with the first aspect or any abovementioned possible implementation thereof, before the operation that the terminal device sends the first message to the access network device, the method may further include the following operations.

The terminal device sends a third message to the access network device, wherein the third message carries second capability information and the second capability information used for indicating the maximum communication capability of the terminal device.

The first capability information is used for indicating the maximum communication capability indicated by the second capability information to be updated into the first communication capability, and the first function parameter information is used for indicating the function parameter or the value range of the function parameter configured for the terminal device by the access network device

according to the maximum communication capability to be updated into the first function parameter or the first value range of the function parameter.

In combination with the first aspect or any abovementioned possible implementation thereof, before the operation that the terminal device sends the third message to the access network device, the method may further include that, the terminal device receives a fourth message from the access network device. The fourth message may be used for requesting for the maximum communication capability of the terminal device.

In combination with the first aspect or any abovementioned possible implementation thereof, the third message may be a message sent to the access network device during an attachment process.

In combination with the first aspect or any abovementioned possible implementation thereof, before the operation that the terminal device sends the first message to the access network device, the method may further include that, the terminal device receives a fifth message from the access network device. The fifth message may be used for indicating at least one of: a communication capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device.

At least one of the first communication capability, the first function parameter, or the first value range of the function parameter are/is determined according to at least one of: the communication capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device.

In combination with the first aspect or any abovementioned possible implementation thereof, the maximum communication capability of the terminal device may include at least one of: a maximum number of carriers supported for carrier aggregation communication, a maximum number of antennas supported for Multiple Input Multiple Output (MIMO) communication, a maximum number of carriers supported for dual connectivity communication, or a maximum receiver capability corresponding to an interference cancellation function.

In combination with the first aspect or any abovementioned possible implementation thereof, the function parameter or the value range of the function parameter of the terminal device for communication may include at least one of: a

number or number range of carriers for carrier aggregation communication, a number or number range of antennas for MIMO communication, a number or number range of carriers for dual connectivity communication, or a receiver capability or capability range corresponding to the interference cancellation function.

5 A second aspect provides a wireless communication method, which may include the following operations.

 An access network device receives a first message from a terminal device. The first message carries at least one of first capability information or first function parameter information, the first capability information is used for indicating the
10 access network that the communication capability is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device that a function parameter of the terminal device for communication is needed to be updated into a first function parameter, or that a value range of the function parameter of the terminal device for communication is
15 needed to be updated into a first value.

 The access network device sends a second message to the terminal device, wherein the second message carries the function parameter or the value range of the function parameter configured for the terminal device by the access network device according to the at least one of the first capability information or the first function
20 parameter information.

 In combination with the second aspect, in a possible implementation of the second aspect, the second message may be a reconfiguration message.

 In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, before the
25 operation that the access network device receives the first message from the terminal device, the method may further include that, the access network device receives a third message from the terminal device. The third message carries second capability information and the second capability information used for indicating the maximum communication capability of the terminal device.

30 The first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating the function parameter or the value range of the

function parameter configured for the terminal device by the access network device according to the maximum communication capability is needed to be updated into the first function parameter or the first value range of the function parameter.

5 In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, before the operation that the access network device receives the third message from the terminal device, the method may further include that, the access network device sends a fourth message to the terminal device. The fourth message is used for requesting for the maximum communication capability that the terminal device may presently support.

10 In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, the third message may be a message sent to the access network device by the terminal device during an attachment process.

15 In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, before the operation that the access network device receives the first message from the terminal device, the method may further include the following operation.

20 The access network device sends a fifth message to the terminal device, wherein the fifth message used for indicating at least one of a communication capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device to enable the terminal device to send the first message according to the fifth message.

25 In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, before the operation that the access network device sends the fifth message to the terminal device, the method may further include the following operation.

30 The access network device determines at least one of the communication capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device according to a present network communication condition.

In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, the

method may further include the following operation.

When the terminal device switches a present serving access network device from the serving access network device to another access network device, the access network device sends a sixth message to the other access network device, wherein the sixth message carries the at least one of the first capability information or the first function parameter information.

In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, the sixth message may further contain at least one of: a communication capability of the terminal device before the updating operation, or a value range of the function parameter of the terminal device before the updating operation.

In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, the maximum communication capability of the terminal device may include at least one of:

a maximum number of carriers supported for carrier aggregation communication, a maximum number of antennas supported for MIMO communication, a maximum number of carriers supported for dual connectivity communication, or a maximum receiver capability corresponding to an interference cancellation function.

In combination with the second aspect or any abovementioned possible implementation thereof, in a possible implementation of the second aspect, the function parameter or the value range of the function parameter of the terminal device for communication may include at least one of:

a number or number range of carriers for carrier aggregation communication, a number or number range of antennas for MIMO communication, a number or number range of carriers for dual connectivity communication, or a receiver capability or capability range corresponding to the interference cancellation function.

A third aspect provides a terminal device, which may include units configured to implement the method in the first aspect or any possible implementation thereof.

A fourth aspect provides an access network device, which may include units configured to implement the method in the second aspect or any possible implementation thereof.

A fifth aspect provides a terminal device, which may include a memory and a processor. The memory stores instructions, and the processor is configured to call the instructions stored in the memory to execute the method in the first aspect or any optional implementation thereof.

5 A sixth aspect provides an access network device, which may include a memory and a processor. The memory stores instructions, and the processor is configured to call the instructions stored in the memory to execute the method in the second aspect or any optional implementation thereof.

10 A seventh aspect provides a computer-readable medium, which stores a program code configured to be executed by a terminal device, the program code including instructions configured to execute the method in the first aspect or each implementation thereof or including instructions configured to execute the method in the second aspect or each implementation thereof.

15 An eighth aspect provides a system chip, which includes an input interface, an output interface, a processor and a memory. The processor is configured to execute a code in the memory. When the code is executed, the processor may implement the method in the first aspect and each implementation or execute the method in the second aspect and each implementation.

20 In the embodiments of the present disclosure, the terminal device sends the first message to the access network device, the first message includes the at least one of the first capability information or the first function parameter information, the first capability information is used for indicating the access network device that the maximum communication capability of the terminal device is needed to be updated into the first communication capability, and the first function parameter information is used for indicating the access network device that the function parameter of the terminal device for communication is needed to be updated into the first function parameter, or that the value range of the function parameter of the terminal device for communication is needed to be updated into the first value range of the function parameter; and the access network device, after receiving the first message, may
25 configure the function parameter or the value range of the function parameter for the terminal device according to the at least one of the first capability information or the first function parameter information, so that the terminal device may update its own communication capability and/or the function parameter or the value range of the
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function parameter and report the same to the access network device as required. Therefore, the embodiments can avoid the condition in which the function parameter or the value range of the function parameter configured for the terminal device by the access network device according to the stored maximum communication capability of the terminal device is inconsistent with the present condition of the terminal device, which will cause poor communication performance of the terminal device or damages to hardware of the terminal device,(for example, storage overflow of the terminal device or overheating of the terminal device).

BRIEF DESCRIPTION OF DRAWINGS

In order to describe the technical solutions of the embodiments of the present disclosure more clearly, the drawings required to be used in descriptions about the embodiments or a conventional art will be simply introduced below. It is apparent that the drawings described below are only some embodiments of the present disclosure. Other drawings may further be obtained by those of ordinary skill in the art according to these drawings without creative work.

FIG. 1 illustrates a schematic diagram of a wireless communication system according to an embodiment of the present disclosure.

FIG. 2 illustrates a schematic flowchart of a wireless communication method according to an embodiment of the present disclosure.

FIG. 3 illustrates a schematic flowchart of a wireless communication method according to an embodiment of the present disclosure.

FIG. 4 illustrates a schematic block diagram of a terminal device according to an embodiment of the present disclosure.

FIG. 5 illustrates a schematic block diagram of an access network device according to an embodiment of the present disclosure.

FIG. 6 illustrates a schematic block diagram of a system chip according to an embodiment of the present disclosure.

FIG. 7 illustrates a schematic block diagram of a communication device according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

The technical solutions in the embodiments of the present disclosure will be described below in combination with the drawings in the embodiments of the present disclosure. It is apparent that the described embodiments are not all embodiments but
5 part of embodiments of the present disclosure. All other embodiments obtained by those of ordinary skill in the art based on the embodiments in the present disclosure without creative work shall fall within the scope of protection of the present disclosure.

The technical solutions of the embodiments of the present disclosure may be
10 applied to various communication systems, for example, a Global System of Mobile Communication (GSM), a Code Division Multiple Access (CDMA) system, a Wideband Code Division Multiple Access (WCDMA) system, a General Packet Radio Service (GPRS), an LTE system, an LTE Frequency Division Duplex (FDD) system, LTE Time Division Duplex (TDD), a Universal Mobile Telecommunication
15 System (UMTS), a Worldwide Interoperability for Microwave Access (WiMAX) communication system or a future 5th-Generation (5G) system.

FIG. 1 illustrates a wireless communication system 100 to which the embodiments of the present disclosure are applied. The wireless communication system 100 may include an access network device 110. The access network device
20 110 may be a device communicating with a terminal device. Each access network device 110 may provide communication coverage for a specific geographical region and may communicate with a terminal device (for example, User Equipment (UE)) in the coverage. Alternatively, the access network device 110 may be a Base Transceiver Station (BTS) in the GSM or the CDMA system, may also be a NodeB (NB) in the
25 WCDMA system, and may further be an Evolutional Node B (eNB or eNodeB) in the LTE system or a wireless controller in a Cloud Radio Access Network (CRAN). Or the access network device may be a relay station, an access point, a vehicle-mounted device, a wearable device, a network-side device in a future 5G network, an access network device in a future evolved Public Land Mobile Network (PLMN) or the like.

30 The wireless communication system 100 further includes at least one terminal device 120 within the coverage of the access network device 110. The terminal device 120 may be mobile or stationary. Alternatively, the terminal device 120 may be an access terminal, UE, a user unit, a user station, a mobile station, a mobile radio station,

a remote station, a remote terminal, a mobile device, a user terminal, a terminal, a wireless communication device, a user agent or a user device. The access terminal may be a cell phone, a cordless phone, a Session Initiation Protocol (SIP) phone, a Wireless Local Loop (WLL) station, a Personal Digital Assistant (PDA), a handheld
5 device with a wireless communication function, a computing device, another processing device connected to a wireless modem, a vehicle-mounted device, a wearable device, a terminal device in the future 5G network, a terminal device in the future evolved PLMN or the like.

Alternatively, the terminal device 120 may perform Device to Device (D2D)
10 communication.

Alternatively, the 5G system or network may also be called a New Radio (NR) system or network.

An access network device and two terminal devices are exemplarily illustrated in FIG. 1. Alternatively, the wireless communication system 100 may include multiple
15 access network devices and another number of terminal devices may be included in coverage of each access network device. There are no limits made thereto in the embodiments of the present disclosure.

Alternatively, the wireless communication system 100 may further include another network entity such as a network controller and a mobility management entity.
20 There are no limits made thereto in the embodiments of the present disclosure.

It is to be understood that use of terms "system" and "network" in the disclosure may usually be exchanged in the disclosure. In the disclosure, term "and/or" is only an association relationship describing associated objects and represents that three relationships may exist. For example, A and/or B may represent
25 three conditions: i.e., independent existence of A, existence of both A and B and independent existence of B. In addition, character "/" in the disclosure usually represents that previous and next associated objects form an "or" relationship.

FIG. 2 illustrates a schematic flowchart of a wireless communication method 200 according to an embodiment of the present disclosure. The method 200 may be
30 applied, but not limited, to the system illustrated in FIG. 1. As illustrated in FIG. 2, the method 200 includes the following steps.

In 210, a terminal device sends a first message to an access network device. The first message carries at least one of first capability information or first function

parameter information, the first capability information is used for indicating the access network device that a maximum communication capability of the terminal device is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device that a function parameter(s) of the terminal device for communication is needed to be updated into a first function parameter(s), or that a value range(s) of the function parameter(s) of the terminal device for communication is needed to be updated into the first value range(s) of the function parameter(s).

Alternatively, before the terminal device sends the first message to the access network device, the terminal device determines the first communication capability or the first value and/or value range of the function parameter according to a present communication condition.

Specifically, the terminal device may determine the first communication capability and/or the first function parameter(s) or the first value range(s) of the function parameter(s) according to its own present condition, for example, according to whether the terminal device is overheated or according to a communication requirement.

Alternatively, the access network device sends a fifth message to the terminal device. The fifth message used for indicating a communication capability and/or a function parameter(s) or value range(s) of the function parameter(s) supported by the network device, the terminal device receives the fifth message from the access network device, and the terminal device determines the first communication capability and/or the first function parameter(s) or the first value range(s) of the function parameter(s) according to the communication capability and/or the function parameter(s) or value range(s) of the function parameter(s) supported by the network device.

Specifically, the access network device may determine the communication capability and/or the function parameter(s) or value range(s) of the function parameter(s) that may be supported to be used by the terminal device according to a present network condition, and send the communication capability and/or the function parameter(s) or value range(s) of the function parameter(s) supported to be used by the terminal device to the terminal device through the fifth message. The terminal device, after receiving the fifth message, may determine the first communication

capability and/or the first function parameter(s) or the first value range(s) of the function parameter(s), based on its own condition and the communication capability and/or the function parameter range that the network device supports the terminal device to use. Herein, the first communication capability may belong to the
5 communication capability that the access network device supports the terminal device to use, and the first function parameter or the first value range of the function parameter may also belong to the function parameter or the value range of the function parameter that the access network device supports the terminal device to use.

Of course, the first communication capability may not belong to the
10 communication capability that the access network device supports the terminal device to use, or, the first function parameter(s) or the first value range(s) of the function parameter(s) may not belong to the function parameter(s) or value range(s) of the function parameter(s) that the access network device supports the terminal device to use.

15 It is to be understood that, in the embodiment of the present disclosure, the communication capability and/or the function parameter(s) or value range(s) of the function parameter(s) supported by the network device may be a communication capability and/or a value range of the function parameter supported by the network device in a communication process of the terminal device and the network device.

20 Herein, the network device may support different communication capabilities and/or value ranges of the function parameter for different terminal devices.

Or, the network device may support different communication capabilities and/or different value ranges of the function parameter(s) for different terminal device groups and support the same communication capability and/or the same value range(s)
25 of the function parameter(s) for terminal devices in the same terminal device group.

Or, the network device may support the same communication capability and/or the same value range(s) of the function parameter(s) for terminal devices within its coverage.

Alternatively, the fifth message may be dedicated signaling, or broadcast
30 signaling and the like.

In 220, the access network device receives the first message from the terminal device.

In 230, the access network device sends a second message to the terminal

device. The second message carries the function parameter(s) or the value range(s) of the function parameter(s) configured for the terminal device by the access network device according to the first capability information and/or the first function parameter information.

5 Specifically, the access network device, after receiving the first message from the terminal device, may configure the function parameter(s) or value range(s) of the function parameter(s) for the terminal device according to the first communication capability and/or first function parameter(s) or the first value range(s) of the function parameter(s) in the first message, and the access network device carries the function
10 parameter(s) or value range(s) of the function parameter(s) configured for the terminal device through the second message.

 Alternatively, the second message is a reconfiguration message.

 In 240, the terminal device receives the second message from the access network device.

15 Specifically, the terminal device may receive the second message from the access network device and communicate according to the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device in the second message.

 Alternatively, in the embodiment of the present disclosure, the maximum
20 communication capability of the terminal device includes at least one of:

 a maximum number of carriers supported for carrier aggregation communication, a maximum number of antennas supported for MIMO communication, a maximum number of carriers supported for dual connectivity communication, or a maximum receiver capability corresponding to an interference
25 cancellation function.

 The function parameter(s) or value range(s) of the function parameter(s) of the terminal device for communication includes:

 a number or number range of carriers for carrier aggregation communication, a number or number range of antennas for MIMO communication, a number or number
30 range of carriers for dual connectivity communication, or a receiver capability or capability range corresponding to the interference cancellation function.

 Alternatively, in the embodiment of the present disclosure, before the terminal device sends the first message to the access network device, the terminal device sends

a third message to the access network device. The third message carries second capability information, the second capability information is used for indicating the maximum communication capability of the terminal device. Herein, the first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device according to the maximum communication capability is/are to be updated into the first function parameter(s) or the first value range(s) of the function parameter(s).

Alternatively, before the terminal device sends the third message to the access network device, the terminal device receives a fourth message from the access network device. The fourth message is used for requesting for the maximum communication capability of the terminal device.

Alternatively, the third message is a message sent to the access network device by the terminal device during an attachment process.

Alternatively, in the embodiment of the present disclosure, the first communication capability may be called a temporary communication capability, and the first function parameter(s) or the first value range(s) of the function parameter(s) may be called a temporary function parameter(s) or value range(s) of the function parameter(s).

Alternatively, in the embodiment of the present disclosure, the access network device's updating operation of the maximum communication capability of the terminal device by use of the first communication capability does not mean that the original maximum communication capability is invalid, and the access network device may store the first communication capability and the maximum communication capability before the updating operation, and configure the function parameter(s) or value range(s) of the function parameter(s) by use of the first communication capability and the maximum communication capability before the updating operation.

For example, the function parameter(s) or value range(s) of the parameter(s) configured based on the first communication capability is(are) applicable within a predetermined time period after receiving the first message, and the function

parameter(s) or value range(s) of the function parameter(s) configured based on the maximum communication capability before the updating operation is(are) applicable within other time periods.

For example, the function parameter(s) or value range(s) of the parameter(s) configured based on the first communication capability may be applied to configuration of the function parameter(s) for a certain service, and when the service changes, the function parameter(s) or value range(s) of the function parameter(s) may be configured based on the maximum communication capability before the updating operation.

Similarly, existence of the first function parameter(s) or the first value range(s) of the function parameter(s) does not mean that the original parameter(s) or value range(s) of the parameter(s) configured according to the maximum communication capability is invalid.

FIG. 3 illustrates a schematic flowchart of a wireless communication method 300 according to an embodiment of the present disclosure. As illustrated in FIG. 3, the wireless communication method 300 includes the following steps.

In 310, a terminal device sends a first message to an access network device 1. The first message carries first capability information and/or first function parameter information, the first capability information is used for indicating the access network device 1 that a maximum communication capability of the terminal device is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device 1 that a function parameter(s) of the terminal device for communication is needed to be updated into a first function parameter(s), or that a value range(s) of the function parameter(s) of the terminal device for communication is needed to be updated into the first value range(s) of the function parameter(s).

In 320, the access network device 1 receives the first message from the terminal device.

In 330, the access network device 1 sends a second message to the terminal device. The second message carries the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device 1 according to the first capability information and/or the first function parameter information.

In 340, the terminal device receives the second message from the access network device 1.

In 350, when a present serving access network device is changed from the access network device 1 to an access network device 2 by the terminal device, the
5 access network device 1 sends a sixth message to the access network device 2. The sixth message carries the first capability information and/or the first function parameter information.

Specifically, when the terminal device needs to change the access network device, an original serving access network device for the terminal device in a network
10 may send the updated capability information or function parameter(s) or value range(s) of the function parameter(s) to a target access network device in a handover command, and the target access network device may configure the terminal device according to the updated capability information and/or function parameter(s) or value range(s) of the function parameter(s).

15 Alternatively, the sixth message further carries at least one of: a communication capability of the terminal device before the updating operation, or a value range(s) of the function parameter(s) of the terminal device before the updating operation.

In the embodiment of the present disclosure, the terminal device sends the first
20 message to the access network device. The first message includes the first capability information or the first function parameter information, the first capability information is used for indicating the access network device that the maximum communication capability of the terminal device is needed to be updated into the first communication capability, and the first function parameter information is used for
25 indicating the access network device that the function parameter(s) of the terminal device for communication is needed to be updated into the first function parameter(s), or that the value range(s) of the function parameter(s) of the terminal device for communication is needed to be updated into the first value range(s) of the function parameter(s); and the access network device, after receiving the first message, may
30 configure the function parameter(s) or value range(s) of the function parameter(s) for the terminal device according to the first capability information and/or the first function parameter information, so that the terminal device may update its own communication capability and/or function parameter(s) or value range(s) of the

function parameter(s), and report the same to the access network device as required. Therefore, the embodiments can avoid the condition in which the function parameter or the value range of the function parameter configured for the terminal device by the access network device according to the stored maximum communication capability of the terminal device is inconsistent with the present condition of the terminal device, which will cause poor communication performance of the terminal device or damages to hardware of the terminal device(for example, storage overflow of the terminal device or overheating of the terminal device).

FIG. 4 illustrates a schematic block diagram of a terminal device 400 according to an embodiment of the present disclosure. As illustrated in FIG. 4, the terminal device 400 includes a processing unit 410 and a transceiver unit 420.

The processing unit is configured to generate a first message. The first message carries first capability information and/or first function parameter information, the first capability information is used for indicating an access network device that a maximum communication capability of the terminal device is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device that a function parameter(s) of the terminal device for communication is needed to be updated into a first function parameter(s), or that a value range(s) of the function parameter(s) of the terminal device for communication is needed to be updated into the first value range(s) of the function parameter(s).

The transceiver unit is configured to send the first message to the access network device and receive a second message from the access network device. The second message carries the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device according to the first capability information and/or the first function parameter information.

Alternatively, the processing unit is further configured to determine the first communication capability and/or the first function parameter(s) or the first value range(s) of the function parameter(s) according to a present condition of the terminal device.

Alternatively, the second message is a reconfiguration message.

Alternatively, the transceiver unit is further configured to send a third message

to the access network device. The third message carries second capability information, and the second capability information used for indicating the maximum communication capability of the terminal device.

5 The first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device according to the maximum communication capability is/are to be updated into the first
10 function parameter(s) or the first value range(s) of the function parameter(s).

Alternatively, the transceiver unit is further configured to receive a fourth message from the access network device. The fourth message is used for requesting for the maximum communication capability of the terminal device.

15 Alternatively, the third message is a message sent to the access network device during an attachment process.

Alternatively, the transceiver unit is further configured to receive a fifth message from the access network device. The fifth message used for indicating the communication capability and/or function parameter(s) or value range(s) of the function parameter(s) supported by the network device.

20 The processing unit is further configured to determine the first communication capability and/or the first function parameter(s) or the first value range(s) of the function parameter(s) according to the communication capability and/or first function parameter(s) or the first value range(s) of the function parameter(s) or value range(s) of the function parameter(s) supported by the network device.

25 Alternatively, the maximum communication capability of the terminal device includes at least one of:

a maximum number of carriers supported for carrier aggregation communication, a maximum number of antennas supported for MIMO communication, a maximum number of carriers supported for dual connectivity
30 communication, or a maximum receiver capability corresponding to an interference cancellation function.

Alternatively, the function parameter(s) or value range(s) of the function parameter(s) of the terminal device for communication includes:

a number or number range of carriers for carrier aggregation communication, a number or number range of antennas for MIMO communication, a number or number range of carriers for dual connectivity communication and a receiver capability or capability range corresponding to the interference cancellation function.

5 It is to be understood that the terminal device may correspond to the terminal devices in the method embodiments 200 and 300, may realize corresponding functions realized by the terminal device in the method embodiment 200 or 300 and, for simplicity, will not be elaborated herein.

FIG. 5 illustrates a schematic block diagram of an access network device 500 according to an embodiment of the present disclosure. As illustrated in FIG. 5, the access network device includes a processing unit 510 and a transceiver unit 520.

The transceiver unit is configured to receive a first message from a terminal device. The first message carries first capability information and/or first function parameter information, the first capability information is used for indicating the access network that the communication capability is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device that a function parameter(s) of the terminal device for communication is needed to be updated into a first function parameter(s), or that a value range(s) of a function parameter(s) of the terminal device for communication is needed to be updated into the first value range(s) of the function parameter(s).

The processing unit is further configured to generate a second message. The second message carries the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device according to the first capability information and/or the first function parameter information.

The transceiver unit is further configured to send the second message to the terminal device.

Alternatively, the second message is a reconfiguration message.

30 Alternatively, the transceiver unit is further configured to receive a third message from the terminal device. The third message carries second capability information, and the second capability information used for indicating the maximum communication capability of the terminal device.

The first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating the function parameter(s) or value range(s) of the function parameter(s) configured for the terminal device by the access network device according to the maximum communication capability is/are to be updated into the first function parameter(s) or the first value range(s) of the function parameter(s).

Alternatively, the transceiver unit is further configured to send a fourth message to the terminal device. The fourth message is used for requesting for the maximum communication capability that the terminal device presently supports.

Alternatively, the third message is a message sent to the access network device by the terminal device during an attachment process.

Alternatively, the transceiver unit is further configured to send a fifth message to the terminal device. The fifth message used for indicating a communication capability and/or function parameter(s) or value range(s) of the function parameter(s) supported by the network device to enable the terminal device to send the first message according to the fifth message.

Alternatively, the processing unit is further configured to determine the communication capability and/or function parameter(s) or value range(s) of the function parameter(s) that the network device supports the terminal device to use according to a present communication condition of network.

Alternatively, the transceiver unit is further configured to, when a present serving access network device is switched from the access network device to another access network device, send a sixth message to the other access network device. The sixth message carries the first capability information and/or the first function parameter information.

Alternatively, the sixth message further carries at least one of: a communication capability of the terminal device before the updating operation, or a value range of the function parameter of the terminal device before the updating operation.

Alternatively, the maximum communication capability of the terminal device includes at least one of:

a maximum number of carriers supported for carrier aggregation

communication, a maximum number of antennas supported for MIMO communication, a maximum number of carriers supported for dual connectivity communication, or a maximum receiver capability corresponding to an interference cancellation function.

5 Alternatively, the function parameter(s) or value range(s) of the function parameter(s) of the terminal device for communication includes at least one of:

 a number or number range of carriers for carrier aggregation communication, a number or number range of antennas for MIMO communication, a number or number range of carriers for dual connectivity communication, or a receiver capability or
10 capability range corresponding to the interference cancellation function.

 It is to be understood that the access network device may correspond to the access network devices in the method embodiments 200 and 300, may realize corresponding functions realized by the access network device in the method embodiment 200 or 300 and, for simplicity, will not be elaborated herein.

15 FIG. 6 illustrates a schematic structure diagram of a system chip 600 according to an embodiment of the present disclosure. The system chip 600 of FIG. 6 includes an input interface 601, output interface 602, processor 603 and memory 604 which may be connected through an internal communication connecting line. The processor 603 is configured to execute a code in the memory 704.

20 Alternatively, when the code is executed, the processor 603 implements the method executed by the terminal device in the method 200 or 300 illustrated in FIG. 2 or 3. For simplicity, no more elaborations will be made herein.

 Alternatively, when the code is executed, the processor 603 implements the method executed by the access network device in the method 200 or 300 illustrated in
25 FIG. 2 or 3. For simplicity, no more elaborations will be made herein.

 FIG. 7 illustrates a schematic block diagram of a communication device 700 according to an embodiment of the present disclosure. As illustrated in FIG. 7, the communication device 700 includes a processor 710 and a memory 720. Herein, the memory 720 may store a program code, and the processor 710 may execute the
30 program code stored in the memory 720.

 Alternatively, as illustrated in FIG. 7, the communication device 700 may include a transceiver 730, and the processor 710 may control the transceiver 730 for external communication.

Alternatively, the processor 710 may call the program code stored in the memory 720 to execute corresponding operations of the terminal device in the method 200 or 300 illustrated in FIG. 2 or 3. For similarity, no more elaborations will be made herein.

5 Alternatively, the processor 710 may call the program code stored in the memory 720 to execute corresponding operations of the access network device in the method 200 or 300 illustrated in FIG. 2 or 3. For similarity, no more elaborations will be made herein.

10 Those of ordinary skill in the art may realize that the units and algorithm steps of each example described in combination with the embodiments disclosed in the disclosure may be implemented by electronic hardware or a combination of computer software and the electronic hardware. Whether these functions are executed in a hardware or software manner depends on specific applications and design constraints of the technical solutions. Professionals may realize the described functions for each
15 specific application by use of different methods, but such realization shall fall within the scope of the present disclosure.

 Those skilled in the art may clearly learn about that specific working processes of the system, device and unit described above may be seen from the corresponding processes in the method embodiment and will not be elaborated herein for convenient
20 and brief description.

 In some embodiments provided by the present disclosure, it is to be understood that the disclosed system, device and method may be implemented in another manner. For example, the device embodiment described above is only schematic, and for example, division of the units is only logic function division, and
25 other division manners may be adopted during practical implementation. For example, multiple units or components may be combined or integrated into another system, or some characteristics may be neglected or not executed. In addition, coupling or direct coupling or communication connection between each displayed or discussed component may be indirect coupling or communication connection, implemented
30 through some interfaces, of the device or the units, and may be electrical and mechanical or adopt other forms.

 The units described as separate parts may or may not be physically separated, and parts displayed as units may or may not be physical units, and namely may be

located in the same place, or may also be distributed to multiple network units. Part or all of the units may be selected to achieve the purpose of the solutions of the embodiments according to a practical requirement.

5 In addition, each functional unit in each embodiment of the present disclosure may be integrated into a processing unit, each unit may also physically exist independently, and two or more than two units may also be integrated into a unit.

10 When being realized in form of software functional unit and sold or used as an independent product, the function may also be stored in a computer-readable storage medium. Based on such an understanding, the technical solutions of the present disclosure substantially or parts making contributions to the conventional art or part of the technical solutions may be embodied in form of software product, and the computer software product is stored in a storage medium, including a plurality of instructions configured to enable a computer device (which may be a personal computer, a server, a network device or the like) to execute all or part of the steps of
15 the method in each embodiment of the present disclosure. The abovementioned storage medium includes: various media capable of storing program codes such as a U disk, a mobile hard disk, a Read-Only Memory (ROM), a Random Access Memory (RAM), a magnetic disk or an optical disk.

20 The above is only the specific implementation of the present disclosure and not intended to limit the scope of protection of the present disclosure. Any variations or replacements apparent to those skilled in the art within the technical scope disclosed by the present disclosure shall fall within the scope of protection of the present disclosure. Therefore, the scope of protection of the present disclosure shall be subject to the scope of protection of the claims.

25

CLAIMS

5 1. A wireless communication method, comprising:

sending, by a terminal device, a first message to an access network device,
wherein the first message carries at least one of first capability information or first
function parameter information, the first capability information is used for indicating
the access network device that a maximum communication capability of the terminal
10 device is needed to be updated into a first communication capability, and the first
function parameter information is used for indicating the access network device that a
function parameter of the terminal device for communication is needed to be updated
into a first function parameter, or a value range of the function parameter of the
terminal device for communication is needed to be updated into a first value range of
15 the function parameter; and

receiving, by the terminal device, a second message from the access network
device, wherein the second message carries the function parameter or the value range
of the function parameter configured for the terminal device by the access network
device according to the at least one of the first capability information or the first
20 function parameter information.

2. The method of claim 1, before sending, by the terminal device, the first message to
the access network device, comprising:

determining, by the terminal device, according to a present condition of the
25 terminal device, at least one of the first communication capability or the first function
parameter,

or,

determining, by the terminal device, according to the present condition of the
terminal device, at least one of the first communication capability or the first value
30 range of the function parameter.

3. The method of claim 1 or 2, wherein the second message is a reconfiguration
message.

4. The method of any one of claims 1-3, before sending, by the terminal device, the first message to the access network device, further comprising:

sending, by the terminal device, a third message to the access network device, wherein the third message carries second capability information, and the second
5 capability information used for indicating a maximum communication capability of the terminal device,

wherein the first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter
10 information is used for indicating that the function parameter configured for the terminal device by the access network device according to the maximum communication capability is needed to be updated into the first function parameter, or that the value range of the function parameter configured for the terminal device by the access network device according to the maximum communication capability is
15 needed to be updated into the first value range of the function parameter.

5. The method of claim 4, before sending, by the terminal device, the third message to the access network device, further comprising:

receiving, by the terminal device, a fourth message from the access network
20 device, wherein the fourth message is used for requesting for the maximum communication capability of the terminal device.

6. The method of claim 4 or 5, wherein the third message is a message sent to the access network device during an attachment process.

25

7. The method of any one of claims 1-6, before sending, by the terminal device, the first message to the access network device, further comprising:

receiving, by the terminal device, a fifth message from the access network device, wherein the fifth message used for indicating at least one of: a communication
30 capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device; and

determining at least one of: the first communication capability, the first

function parameter, or the first value range of the function parameter, according to at least one of: the communication capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device.

5

8. The method of any one of claims 1-7, wherein the maximum communication capability of the terminal device comprises at least one of:

a maximum number of carriers supported for carrier aggregation communication,

10 a maximum number of antennas supported for Multiple Input Multiple Output (MIMO) communication,

a maximum number of carriers supported for dual connectivity communication, or

15 a maximum receiver capability corresponding to an interference cancellation function.

9. The method of any one of claims 1-7, wherein the function parameter or the value range of the function parameter of the terminal device for communication comprises at least one of:

20 a number or number range of carriers for carrier aggregation communication,
a number or number range of antennas for MIMO communication,
a number or number range of carriers for dual connectivity communication, or
a receiver capability or capability range corresponding to an interference cancellation function.

25

10. A wireless communication method, comprising:

receiving, by an access network device, a first message from a terminal device, wherein the first message carries at least one of first capability information or first function parameter information, the first capability information is used for indicating
30 the access network that the communication capability is needed to be updated into a first communication capability, and the first function parameter information is used for indicating the access network device that a function parameter of the terminal device for communication is needed to be updated into a first function parameter, or

that a value range of the function parameter of the terminal device for communication is needed to be updated into a first value range of the function parameter; and

5 sending, by the access network device, a second message to the terminal device, wherein the second message carries the function parameter or the value range of the function parameter configured for the terminal device by the access network device according to the at least one of the first capability information or the first function parameter information.

10 11. The method of claim 10, wherein the second message is a reconfiguration message.

12. The method of claim 10 or 11, before receiving, by the access network device, the first message from the terminal device, further comprising:

15 receiving, by the access network device, a third message from the terminal device, wherein the third message carries second capability information, and the second capability information used for indicating the maximum communication capability of the terminal device,

20 wherein the first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating that the function parameter configured for the terminal device by the access network device according to the maximum communication capability is needed to be updated into a first function parameter, or
25 that the value range of the function parameter configured for the terminal device by the access network device according to the maximum communication capability is needed to be updated into a first value range of the function parameter.

13. The method of claim 12, before receiving, by the access network device, the third message from the terminal device, further comprising:

30 sending, by the access network device, a fourth message to the terminal device, wherein the fourth message is used for requesting for the maximum communication capability that the terminal device presently supports.

14. The method of claim 12 or 13, wherein the third message is a message sent to the access network device by the terminal device during an attachment process.

15. The method of any one of claims 10-14, before receiving, by the access network
5 device, the first message from the terminal device, further comprising:

sending, by the access network device, a fifth message to the terminal device,
wherein the fifth message used for indicating at least one of: a communication
capability supported by the network device, the function parameter supported by the
network device, or the value range of the function parameter supported by the
10 network device, to enable the terminal device to send the first message according to
the fifth message.

16. The method of claim 15, before sending, by the access network device, the fifth
message to the terminal device, further comprising:

15 determining, by the access network device, according to a present
communication condition of network, at least one of: the communication capability
supported by the network device, the function parameter supported by the network
device, or a value range of the function parameter supported by the network device.

20 17. The method of any one of claims 10-16, further comprising:

when the terminal device switches from a serving access network device to
another access network device, sending, by the serving access network device, a sixth
message to the another access network device, wherein the sixth message carries the
at least one of the first capability information or the first function parameter
25 information.

18. The method of claim 17, wherein the sixth message further carries at least one of:
a communication capability of the terminal device before the updating operation, or a
value range of the function parameter of the terminal device before the updating
30 operation.

19. The method of any one of claims 10-18, wherein the maximum communication
capability of the terminal device comprises at least one of:

a maximum number of carriers supported for carrier aggregation communication,

a maximum number of antennas supported for Multiple Input Multiple Output (MIMO) communication,

5 a maximum number of carriers supported for dual connectivity communication, or

a maximum receiver capability corresponding to an interference cancellation function.

10 20. The method of any one of claims 10-19, wherein the function parameter or the value range of the function parameter of the terminal device for communication comprises at least one of:

a number or number range of carriers for carrier aggregation communication,

a number or number range of antennas for MIMO communication,

15 a number or number range of carriers for dual connectivity communication, or

a receiver capability or capability range corresponding to an interference cancellation function.

21. A terminal device, comprising a processing unit and a transceiver unit, wherein

20 the processing unit is configured to generate a first message, wherein the first message carries at least one of first capability information or first function parameter information, the first capability information is used for indicating an access network device that a maximum communication capability of the terminal device is needed to be updated into a first communication capability, and the first function parameter

25 information is used for indicating the access network device that a function parameter or a value range of the function parameter of the terminal device for communication is needed to be updated into a first function parameter, or that a value range of the function parameter of the terminal device for communication is needed to be updated into a first value range of the function parameter; and

30 the transceiver unit is configured to send the first message to the access network device and receive a second message from the access network device, wherein the second message carries the function parameter or the value range of the function parameter configured for the terminal device by the access network device

according to the at least one of the first capability information or the first function parameter information.

22. The terminal device of claim 21, wherein the processing unit is further configured to:

determine, according to a present condition of the terminal device, at least one of the first communication capability or a first function parameter;

or,

determine, according to the present condition of the terminal device, at least one of the first communication capability or a first value range of the function parameter.

23. The terminal device of claim 21 or 22, wherein the second message is a reconfiguration message.

24. The terminal device of any one of claims 21-23, wherein the transceiver unit is further configured to:

send a third message to the access network device, wherein the third message carries second capability information, and the second capability information used for indicating the maximum communication capability of the terminal device,

wherein the first capability information is used for indicating the maximum communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating that the function parameter configured for the terminal device by the access network device according to the maximum communication capability is needed to be updated into a first function parameter, or that the value range of the function parameter configured for the terminal device by the access network device according to the maximum communication capability is needed to be updated into a first value range of the function parameter.

25. The terminal device of claim 24, wherein the transceiver unit is further configured to:

receive a fourth message from the access network device, wherein the fourth

message is used for requesting for the maximum communication capability of the terminal device.

26. The terminal device of claim 24 or 25, wherein the third message is a message
5 sent to the access network device during an attachment process.

27. The terminal device of any one of claims 21-26, wherein the transceiver unit is further configured to:

10 receive a fifth message from the access network device, wherein the fifth message used for indicating at least one of: a communication capability supported by the network device, the function parameter supported by the network device, or a value range of the function parameter supported by the network device; and

15 the processing unit is further configured to determine at least one of the first communication capability, a first function parameter, or a first value range of the function parameter according to at least one of: the communication capability supported by the network device, the function parameter supported by the network device, or the value range of the function parameter supported by the network device.

28. The terminal device of any one of claims 21-27, wherein the maximum
20 communication capability of the terminal device comprises at least one of:

a maximum number of carriers supported for carrier aggregation communication,

a maximum number of antennas supported for Multiple Input Multiple Output (MIMO) communication,

25 a maximum number of carriers supported for dual connectivity communication, or

a maximum receiver capability corresponding to an interference cancellation function.

30 29. The terminal device of any one of claims 21-27, wherein the function parameter or the value range of the function parameter of the terminal device for communication comprises at least one of:

a number or number range of carriers for carrier aggregation communication,

a number or number range of antennas for MIMO communication,
a number or number range of carriers for dual connectivity communication, or
a receiver capability or capability range corresponding to an interference
cancellation function.

5

30. An access network device, comprising a processing unit and a transceiver unit,
wherein

the transceiver unit is configured to receive a first message from a terminal
device, wherein the first message carries at least one of first capability information or
10 first function parameter information, the first capability information is used for
indicating the access network that the communication capability is needed to be
updated into a first communication capability, and the first function parameter
information is used for indicating the access network device that a function parameter
of the terminal device for communication is needed to be updated into a first function
15 parameter, or that a value range of the function parameter of the terminal device for
communication is needed to be updated into a first value;

the processing unit is further configured to generate a second message,
wherein the second message carries the function parameter or the value range of the
function parameter configured for the terminal device by the access network device
20 according to the at least one of the first capability information or the first function
parameter information; and

the transceiver unit is further configured to send the second message to the
terminal device.

25 31. The access network device of claim 30, wherein the second message is a
reconfiguration message.

32. The access network device of claim 30 or 31, wherein the transceiver unit is
further configured to:

30 receive a third message from the terminal device, wherein the third message
carries second capability information, and the second capability information used for
indicating the maximum communication capability of the terminal device,

wherein the first capability information is used for indicating the maximum

communication capability indicated by the second capability information is needed to be updated into the first communication capability, and the first function parameter information is used for indicating the function parameter or the value range of the function parameter configured for the terminal device by the access network device
5 according to the maximum communication capability is needed to be updated into the first function parameter or the first value range of the function parameter.

33. The access network device of claim 32, wherein the transceiver unit is further configured to:
10 send a fourth message to the terminal device, wherein the fourth message is used for requesting for the maximum communication capability that the terminal device presently supports.

34. The access network device of claim 32 or 33, wherein the third message is a
15 message sent to the access network device by the terminal device during an attachment process.

35. The access network device of any one of claims 30-34, wherein the transceiver unit is further configured to:
20 send a fifth message to the terminal device, wherein the fifth message used for indicating at least one of a communication capability supported by the network device, the function parameter supported by the network device, or the first value range of the function parameter supported by the network device, to enable the terminal device to send the first message according to the fifth message.

25
36. The access network device of claim 35, wherein the processing unit is further configured to:
Determine, according to a present communication condition of network, at least one of: the communication capability supported by the network device, the
30 function parameter supported by the network device, or the value range of the function parameter supported by the network device.

37. The access network device of any one of claims 30-36, wherein the transceiver

unit is further configured to:

when a present serving access network device is switched from the serving access network device to another access network device, send a sixth message to the another access network device, wherein the sixth message carries the at least one of the first capability information or the first function parameter information.

38. The access network device of claim 37, wherein the sixth message further carries at least one of: a communication capability of the terminal device before the updating operation, or a value range of the function parameter of the terminal device before the updating operation.

39. The terminal device of any one of claims 30-38, wherein the maximum communication capability of the terminal device comprises at least one of:

a maximum number of carriers supported for carrier aggregation communication,

a maximum number of antennas supported for Multiple Input Multiple Output (MIMO) communication,

a maximum number of carriers supported for dual connectivity communication, or

a maximum receiver capability corresponding to an interference cancellation function.

40. The access network device of any one of claims 30-39, wherein the function parameter or the value range of the function parameter of the terminal device for communication comprises at least one of:

a number or number range of carriers for carrier aggregation communication,

a number or number range of antennas for MIMO communication,

a number or number range of carriers for dual connectivity communication, or

a receiver capability or capability range corresponding to the interference cancellation function.