

RESOURCE CONFIGURATION METHOD, TERMINAL DEVICE AND NETWORK DEVICE

TECHNICAL FIELD

[0001] Embodiments of the present disclosure generally relate to communication technologies, and more particularly, to resource configuration methods, terminal devices and network devices.

BACKGROUND

[0002] The device-to-device communication (D2D) technology is based on the sidelink. The D2D technology does not use the uplink and downlink transmission resources of base stations, and thus has unique advantages and has been introduced in the Rel-12 version of the Long Term Evolution (LTE). With the advancement of research and standardization of New Radio (NR) in the 5th generation (5G) system, it is an inevitable trend to introduce into the 5G systems the D2D communication technology which uses the sidelink.

[0003] A scheduling mode and a resource pool mode are introduced in the existing LTE D2D, which are simply referred to as mode 1 and mode 2, respectively. Mode 1 can only be used in the connected state, and is scheduled by a base station. This mode requires to use the Uu interface between the terminal device and the base station, and the terminal device needs to be maintained in the connected state, and accordingly the energy consumption is large. Mode 2 can be used in the connected state. Mode 2 can also be used in the idle mode, but only the shared resource pool can be used. When the shared resource pool is used, there may be conflicts. Thus, in the LTE D2D-based Vehicle To X (V2X) systems, sensing is introduced to the shared resource pool mode, but the introduced sensing may increase latency

SUMMARY

[0004] Embodiments of the present disclosure provide resource configuration methods, terminal devices and network devices, to reduce energy consumption of the terminal devices and improve performance of communication system.

[0005] According to a first aspect, there is provided a resource configuration method,

including:

[0006] if a first terminal device is in a connected state, receiving resource configuration information sent by a network device, wherein the resource configuration information is used to indicate a dedicated transmission resource; and

[0007] if the first terminal device is in an inactive state or an idle state, sending data to a second terminal device using the dedicated transmission resource.

[0008] In the resource configuration method according to embodiments of the present disclosure, the terminal device receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[0009] In connection with the first aspect, in a possible implementation of the first aspect, receiving resource configuration information sent by a network device includes:

[0010] receiving, by the first terminal device, a Radio Resource Control (RRC) message sent by the network device, wherein the RRC message includes the resource configuration information.

[0011] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

[0012] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the method further includes:

[0013] if the first terminal device is in the connected state, receiving from the network device receiving resource information, wherein the receiving resource information is used to indicate a receiving resource set; and

[0014] if the first terminal device is in the inactive state or the idle state, receiving data sent from a third terminal device using a resource in the receiving resource set.

[0015] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, receiving from the network device receiving resource information, includes:

[0016] receiving, by the first terminal device, RRC signaling or a System Information Block (SIB) sent by the network device, wherein the RRC signaling and the SIB include the receiving resource information.

[0017] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, receiving, by the first terminal device, RRC signaling or a SIB sent by the network device includes:

[0018] receiving, by the first terminal device, the SIB periodically broadcast by the network device.

[0019] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the dedicated transmission resource belongs to the receiving resource set.

[0020] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the dedicated transmission resource is used only for the first terminal device to send data.

[0021] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the dedicated transmission resource is used for a terminal device group to transmit data, the terminal device group includes at least two terminal devices, and the at least two terminal devices includes the first terminal device.

[0022] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group, and only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

[0023] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, a plurality of terminal devices in the terminal device group send data concurrently, and the plurality of terminal devices use different dedicated transmission resources to concurrently send data.

[0024] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the resource configuration information includes an identifier of the first terminal device.

[0025] In connection with the first aspect and the above implementations, in another possible implementation of the first aspect, the identifier of the first terminal device is used to indicate a source address by which the first terminal device sends data to the second terminal device.

[0026] It should be understood that the identifier of the first terminal device can uniquely identify the first terminal device.

[0027] According to exemplary embodiments, the identifier of the first terminal device may be processed using certain Hash algorithm or truncate algorithm to generate a short identifier which may be used to identify the first terminal device.

[0028] In the resource configuration method according to embodiments of the present disclosure, the terminal device receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[0029] According to a second aspect, there is provided a resource configuration method, including:

[0030] configuring, by a network device, a dedicated transmission resource for a first terminal device, wherein the dedicated transmission resource is used by the first terminal device to send data to a second terminal device if the first terminal device is in an inactive state or an idle state; and

[0031] sending, by the network device, resource configuration information to the first terminal device which is in a connected state, wherein the resource configuration information is used to indicate the dedicated transmission resource.

[0032] In the resource configuration methods according to embodiments of the present disclosure, the network device may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[0033] In connection with the second aspect, in a possible implementation of the second aspect, sending, by the network device, resource configuration information to the first terminal device which is in a connected state, includes:

[0034] sending, by the network device, a Radio Resource Control (RRC) message to the first terminal device which is in the connected state, wherein the RRC message includes the resource configuration information.

[0035] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

[0036] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, the method further includes:

[0037] sending, by the network device, receiving resource information to the first terminal device which is in the connected state, wherein the receiving resource information is used to indicate a receiving resource set, and a resource in the receiving resource set is used for the first terminal device to receive data from a third terminal device if the first terminal device is in the inactive state or the idle state.

[0038] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, sending, by the network device, receiving resource information to the first terminal device which is in the connected state,

includes:

[0039] sending, by the first terminal device, RRC signaling or a System Information Block (SIB) to the first terminal device which is in the connected state, wherein the RRC signaling and the SIB include the receiving resource information.

[0040] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, sending, by the first terminal device, RRC signaling or a SIB to the first terminal device which is in the connected state, includes:

[0041] periodically broadcasting the SIB by the network device.

[0042] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, configuring, by a network device, a dedicated transmission resource for a first terminal device, includes:

[0043] determining, by the network device, the dedicated transmission resource from the receiving resource set.

[0044] It should be understood that the network device may send the receiving resource set to the second terminal device, so that the second terminal device may receive the data sent from the first terminal device using a resource in the receiving resource set.

[0045] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, configuring, by a network device, a dedicated transmission resource for a first terminal device, includes:

[0046] configuring, by the network device, the dedicated transmission resource for a terminal device group, wherein the terminal device group includes at least two terminal devices, and the at least two terminal devices include the first terminal device.

[0047] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group;

[0048] wherein configuring, by the network device, the dedicated transmission resource for a terminal device group, includes:

[0049] configuring, by the network device, the dedicated transmission resource for the terminal device group, wherein only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

[0050] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, a plurality of terminal devices in the terminal device group send data concurrently;

[0051] wherein configuring, by the network device, the dedicated transmission resource for a terminal device group, includes:

[0052] configuring, by the network device, a plurality of the dedicated transmission resources for the terminal device group, wherein the plurality of terminal devices use different dedicated transmission resources in the plurality of the dedicated transmission resources to concurrently send data.

[0053] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, configuring, by a network device, a dedicated transmission resource for a first terminal device, includes:

[0054] determining, by the network device, the dedicated transmission resource by negotiating with another network device, wherein the another network device and the network device are different network devices located in a same Radio Access Network (RAN) area.

[0055] It should be noted that the network device may determine the dedicated transmission resource for at least one terminal device by negotiating with other network devices, and the at least one terminal device may include the first terminal device.

[0056] In connection with the second aspect and the above implementations, in another possible implementation of the second aspect, the resource configuration information includes an identifier of the first terminal device.

[0057] In the resource configuration method according to embodiments of the present disclosure, the network device may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments

of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[0058] According to a third aspect, there is provided a terminal device. The terminal device is configured to performing the methods according to the first aspect or any of the possible implementations in the first aspect. In particular, the terminal device includes units for performing the methods according to the first aspect or any of the possible implementations in the first aspect.

[0059] According to a fourth aspect, there is provided a network device. The network device is configured to performing the methods according to the second aspect or any of the possible implementations in the second aspect. In particular, the network device includes units for performing the methods according to the second aspect or any of the possible implementations in the second aspect.

[0060] According to a fifth aspect, there is provided a terminal device. The terminal device includes a storage unit and a processor. The storage unit is configured to store instructions, and the processor is configured to execute the instructions stored in the memory. When the processor executes the instructions in the memory, the processor is caused to perform the methods according to the first aspect or any of the possible implementations in the first aspect.

[0061] According to a sixth aspect, there is provided a network device. The network device includes a storage unit and a processor. The storage unit is configured to store instructions, and the processor is configured to execute the instructions stored in the memory. When the processor executes the instructions in the memory, the processor is caused to perform the methods according to the second aspect or any of the possible implementations in the second aspect.

[0062] According to a seventh aspect, there is provided a computer-readable medium. The computer-readable medium is configured to store computer programs. The computer programs include instructions for performing the methods according to the first aspect or any of the possible implementations in the first aspect.

[0063] According to an eighth aspect, there is provided a computer-readable medium. The computer-readable medium is configured to store computer programs. The computer

programs include instructions for performing the methods according to the second aspect or any of the possible implementations in the second aspect.

[0064] According to a ninth aspect, there is provided a computer program product including instructions. When instructions of the computer program product are executed by a computer, the computer performs the resource configuration methods according to the first aspect or any of the possible implementations in the first aspect. According to exemplary embodiments, the computer program product can run on the terminal device according to the third aspect.

[0065] According to a tenth aspect, there is provided a computer program product including instructions. When instructions of the computer program product are executed by a computer, the computer performs the resource configuration methods according to the second aspect or any of the possible implementations in the second aspect. According to exemplary embodiments, the computer program product can run on the network device according to the fourth aspect.

BRIEF DESCRIPTION OF THE DRAWINGS

[0066] FIG. 1 is a schematic flowchart of a resource configuration method according to an embodiment of the present disclosure.

[0067] FIG. 2 is another schematic flowchart of a resource configuration method according to an embodiment of the present disclosure.

[0068] FIG. 3 is a schematic block diagram of a terminal device according to an embodiment of the present disclosure.

[0069] FIG. 4 is a schematic block diagram of a network device in accordance with an embodiment of the present disclosure.

[0070] FIG. 5 is another schematic block diagram of a terminal device according to an embodiment of the present disclosure.

[0071] FIG. 6 is another schematic block diagram of a network device according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0072] The technical solutions in the embodiments of the present disclosure will be described below with reference to the accompanying drawings.

[0073] The technical solutions of the embodiments of the present disclosure can be applied to various communication systems, such as an LTE system, an LTE Frequency Division Duplex (FDD) system, an LTE Time Division Duplex (TDD) system, and a Universal Mobile Telecommunication System (UMTS), a future fifth generation (5G) system, i.e., the new radio (NR) system, and so on.

[0074] The terminal device in the embodiments of the present disclosure may refer to user equipment, an access terminal, a subscriber unit, a subscriber station, a mobile station, a mobile terminal, 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 terminal device may be a cellular phone, a cordless phone, a Session Initiation Protocol (SIP) phone, a Wireless Local Loop (WLL) station, a Personal Digital Assistant (PDA), a handheld device with wireless communication functions, computing devices or other processing devices connected to wireless modems, in-vehicle devices, wearable devices, terminal devices in future 5G networks, or terminal devices in the future evolutionary Public Land Mobile Network (PLMN), and the like. Embodiments of the present disclosure do not impose specific limitations on this.

[0075] The network device in the embodiments of the present disclosure may be a device which communicates with a terminal device. For example, the network device may be an evolutionary base station (eNB or eNodeB) in the LTE system, or may be a wireless controller in a cloud radio access network (CRAN) scenario, or the network device may be a relay station, an access point, an in-vehicle device, a wearable device, or a network device in the future 5G network or a network device in the future evolutionary Public Land Mobile Network (PLMN), and the like. Embodiments of the present disclosure do not impose specific limitations on this.

[0076] FIG. 1 shows a schematic flowchart of a resource configuration method 100 according to an embodiment of the present disclosure. The method 100 may be performed by a terminal device. As shown in FIG. 1, the method 100 includes:

[0077] In S110, if a first terminal device is in a connected state, the first terminal

device receives resource configuration information sent by a network device. The resource configuration information is used to indicate a dedicated transmission resource.

[0078] In the embodiments of the present disclosure, when the first terminal device is in the connected state, the network device may allocate a dedicated transmission resource to the first terminal device, and send the dedicated transmission resource to the first terminal device by using the resource configuration information. The dedicated transmission resource is used for the first terminal device to send data to a second terminal device. The first terminal device is any one terminal device, and the second terminal device may be any terminal device other than the first terminal device, and the dedicated transmission resource may be a resource pool.

[0079] It should be understood that the network device may determine the dedicated transmission resource by negotiating with other network devices. For example, different network devices in the same Radio Access Network (RAN) area can negotiate through the Xn interface to configure the dedicated transmission resource(s) for one terminal device or a plurality of terminal devices included in a terminal device group.

[0080] It should be understood that the dedicated transmission resources configured by different network devices in the same RAN area for a plurality of terminal devices are different from a shared resource pool. The allocated dedicated transmission resources are dedicated to the plurality of terminal devices. For example, different network devices in the same RAN area may negotiate to determine dedicated transmission resource(s) for the plurality of terminal devices, and send resource configuration information to the first terminal device in the plurality of terminal devices by using one of the network devices. The resource configuration information is used to indicate the dedicated transmission resource configured for the first terminal device.

[0081] According to exemplary embodiments, the first terminal device may receive an RRC message sent by the network device. The RRC message includes the resource configuration information, and the resource configuration information indicates the dedicated transmission resource for the first terminal device.

[0082] According to exemplary embodiments, the RRC message may be further used to instruct the first terminal device to transit from one state to another state. For example, the

first terminal device receives the RRC message sent by the network device, and the RRC message may be used to instruct the first terminal device to transit from the current connected state to the inactive state or the idle state. The first terminal device transits from the connected state to the inactive state or the idle state according to the RRC message. The first terminal device determines the dedicated transmission resource as indicated by the resource configuration information in the RRC message, and uses the dedicated transmission resource to send data using the sidelink. In this way, the terminal device in the active state or the idle state may receive the data sent via the sidelink, without interactions with the network device.

[0083] In the embodiment of the present disclosure, the resource configuration information sent by the network device to the first terminal device may further include an identifier of the first terminal device. For example, the network device maintains an index of the terminal device context. The index for the terminal device in the inactive state is unique across multiple network devices. The identifier of the first terminal device may uniquely identify the first terminal device, and the identifier of the first terminal device may indicate that the dedicated transmission resource indicated in the resource configuration information is a resource configured for the first terminal device. According to exemplary embodiments, the first terminal device may also use the identifier as its own identifier, for example as a source address or a destination address in a sidelink transmission. According to exemplary embodiments, the identifier of the first terminal device may be processed, for example, according to a certain Hash algorithm or a truncation algorithm, to generate a short identifier, and the first terminal device is uniquely identified by the truncated identifier. The embodiments of the present disclosure do not impose specific limitations on this.

[0084] As shown in FIG. 1, the method 100 further includes:

[0085] In S120, if the first terminal device is in an inactive state or an idle state, the first terminal device sends data to a second terminal device using the dedicated transmission resource. The second terminal device may be any other terminal device than the first terminal device.

[0086] It should be understood that the dedicated transmission resource configured by the network device for the first terminal device may correspond to only the first terminal device, or may correspond to a terminal device group including the first terminal device. For

example, the network device may allocate the dedicated transmission resource only to the first terminal device, and the first terminal device may use the resource in an exclusive manner according to the configured dedicated transmission resource in a configured time. According to exemplary embodiments, the network device may also configure the dedicated transmission resource for the terminal device group, the first terminal device belongs to the terminal device group, and the terminal device group may use the dedicated transmission resource.

[0087] In the embodiments of the present disclosure, in the case where the network device allocates a transmission resource for sidelink to the terminal device group, if a certain group relationship exists in the terminal device group and there is no concurrent transmission performed by at least two terminal devices in the terminal device group, the network device may allocate one dedicated transmission resource to the terminal device group. For example, the network device allocates one dedicated transmission resource to the terminal device group, and each terminal device in the terminal device group uses this dedicated transport resource. If there is no certain group relationship in the terminal device group, that is, a plurality of terminal devices in the terminal device group may concurrently send data, the network device may allocate a plurality of dedicated transmission resources for the terminal device group, so that a plurality of terminal devices may use different dedicated transmission resources to concurrently transmit data or information.

[0088] According to exemplary embodiments, if the network device allocates the same dedicated transmission resource to a terminal device group, for example, the same resource pool is allocated, the network device may identify the dedicated transmission resource by using the identifier of the terminal device group. For example, the resource configuration information sent by the network device to any one terminal device in the terminal device group for indicating the dedicated transmission resource may include an identifier of the terminal device group, so that each terminal device in the terminal device group can use the dedicated transmission resource.

[0089] According to exemplary embodiments, the first terminal device may use the dedicated transmission resource to send data to the second terminal device. Also, the first terminal device may use a shared resource pool to send data to the second terminal device,

rather than using the dedicated transmission resource. For example, by sensing, the first terminal device may use a resource in the shared resource pool to perform sidelink data transmission. Embodiments of the present disclosure do not impose specific limitations on this.

[0090] In embodiments of the present disclosure, the method 100 may further include: receiving by the first terminal device receiving resource information sent from the network device, wherein the receiving resource information is used to indicate a receiving resource set, so that when the first terminal device is in the inactive state or the idle state, the first terminal device may use a resource in the receiving resource set to receive data sent by a third terminal device. The third terminal device is any other terminal device than the first terminal device.

[0091] It should be understood that the network device allocates a receiving resource set which is used for receiving data or information to at least one terminal device, and sends the receiving resource set to the at least one terminal device by using SIB or RRC signaling. For example, the network device may send receiving resource information which includes the receiving resource set, so that each terminal device in the at least one terminal device determines from the receiving resource set a resource for receiving data sent by other terminal device.

[0092] According to exemplary embodiments, the network device may send the receiving resource information including the receiving resource set to the at least one terminal device by using a periodically broadcasted SIB. Alternatively, the network device may allocate the receiving resource set to the at least one terminal device according to an on-demand request sent by any terminal device in the at least one terminal device.

[0093] In embodiments of the present disclosure, the network device sends the receiving resource information to the first terminal device. The receiving resource information is used to indicate the receiving resource set. The first terminal device may use a resource in the receiving resource set to receive the data sent by other terminal devices. According to exemplary embodiments, the network device may determine a part of resources in the receiving resource set as the dedicated transmission resource, send the dedicated transmission resource to the first terminal device, and send the receiving resource set to the second terminal device. The first terminal device may use the dedicated transmission resource

to send data to the second terminal device, and the second terminal device may determine a receiving resource according to the receiving resource set to receive the data sent by the first terminal device.

[0094] In the resource configuration methods according to embodiments of the present disclosure, the terminal device receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[0095] The resource configuration methods according to embodiments of the present disclosure are described in detail from the perspective of the terminal device with reference to FIG. 1. The resource configuration methods according to embodiments of the present disclosure will be described below from the perspective of the network device with reference to FIG. 2.

[0096] FIG. 2 shows a schematic flowchart of a resource configuration method 200 according to an embodiment of the present disclosure. The method 200 may be performed by a network device. As shown in FIG. 2, the method 200 includes:

[0097] In S210, the network device configures a dedicated transmission resource for a first terminal device. The dedicated transmission resource is used by the first terminal device to send data to a second terminal device if the first terminal device is in an inactive state or an idle state.

[0098] In S220, the network device sends resource configuration information to the first terminal device which is in a connected state. The resource configuration information is used to indicate the dedicated transmission resource.

[0099] In the resource configuration method according to embodiments of the present disclosure, the network device may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the

terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00100] According to exemplary embodiments, sending, by the network device, resource configuration information to the first terminal device which is in a connected state, includes:

[00101] sending, by the network device, a Radio Resource Control (RRC) message to the first terminal device which is in the connected state, wherein the RRC message includes the resource configuration information.

[00102] According to exemplary embodiments, the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

[00103] According to exemplary embodiments, the method 200 further includes:

[00104] sending, by the network device, receiving resource information to the first terminal device which is in the connected state, wherein the receiving resource information is used to indicate a receiving resource set, and a resource in the receiving resource set is used for the first terminal device to receive data from a third terminal device if the first terminal device is in the inactive state or the idle state.

[00105] According to exemplary embodiments, sending, by the network device, receiving resource information to the first terminal device which is in the connected state, includes:

[00106] sending, by the first terminal device, RRC signaling or a System Information Block (SIB) to the first terminal device which is in the connected state, wherein the RRC signaling and the SIB includes the receiving resource information.

[00107] According to exemplary embodiments, sending, by the first terminal device, RRC signaling or a SIB to the first terminal device which is in the connected state, includes:

- [00108]** periodically broadcasting the SIB by the network device.
- [00109]** According to exemplary embodiments, configuring, by a network device, a dedicated transmission resource for a first terminal device, includes:
- [00110]** determining, by the network device, the dedicated transmission resource from the receiving resource set.
- [00111]** According to exemplary embodiments, configuring, by a network device, a dedicated transmission resource for a first terminal device, includes:
- [00112]** configuring, by the network device, the dedicated transmission resource for a terminal device group, wherein the terminal device group includes at least two terminal devices, and the at least two terminal devices includes the first terminal device.
- [00113]** According to exemplary embodiments, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group;
- [00114]** configuring, by the network device, the dedicated transmission resource for a terminal device group, includes:
- [00115]** configuring, by the network device, the dedicated transmission resource for the terminal device group, wherein only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.
- [00116]** According to exemplary embodiments, a plurality of terminal devices in the terminal device group send data concurrently;
- [00117]** wherein configuring, by the network device, the dedicated transmission resource for a terminal device group, includes:
- [00118]** configuring, by the network device, a plurality of the dedicated transmission resources for the terminal device group, wherein the plurality of terminal devices use different dedicated transmission resources in the plurality of the dedicated transmission resources to concurrently send data.
- [00119]** According to exemplary embodiments, configuring, by a network device, a dedicated transmission resource for a first terminal device, includes:
- [00120]** determining, by the network device, the dedicated transmission resource by negotiating with another network device, wherein the another network device and the network device are different network devices located in a same Radio Access Network (RAN)

area.

[00121] According to exemplary embodiments, the resource configuration information includes an identifier of the first terminal device.

[00122] It should be understood that the network device in the method 200 in the embodiments of the present disclosure corresponds to the network device in the method 100, and the first terminal device in the method 200 corresponds to the first terminal device in the method 100, and details are not described herein again.

[00123] In the resource configuration methods according to embodiments of the present disclosure, the network device may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The resource configuration method according to embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00124] It should be understood that, in the various embodiments of the present disclosure, the sequence numbers of the foregoing processes do not mean the order of execution sequence, and the order of execution of the processes should be determined by their functions and internal logics, and the sequence numbers are not intended to impose any limitation on the present disclosure.

[00125] The resource configuration methods according to embodiments of the present disclosure are described in detail above with reference to FIG. 1 to FIG. 2. Terminal devices and network devices according to embodiments of the present disclosure will be described below with reference to FIG. 3 to FIG. 6.

[00126] As shown in FIG. 3, the terminal device 300 according to an embodiment of the present disclosure includes a receiving unit 310 and a sending unit 320.

[00127] The receiving unit 310 is configured to, if the terminal device 300 is in a connected state, receive resource configuration information sent by a network device. The

resource configuration information is used to indicate a dedicated transmission resource.

[00128] The sending unit 320 is configured to, if the terminal device 300 is in an inactive state or an idle state, send data to a second terminal device using the dedicated transmission resource.

[00129] The terminal device according to embodiments of the present disclosure receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00130] According to exemplary embodiments, the receiving unit 310 is configured to:

[00131] receive a Radio Resource Control (RRC) message sent by the network device if the terminal device is in the connected state, wherein the RRC message includes the resource configuration information.

[00132] According to exemplary embodiments, the RRC message is used to indicate that the terminal device transits from the connected state to the inactive state or the idle state.

[00133] According to exemplary embodiments, the receiving unit 310 is further configured to:

[00134] if the terminal device 300 is in the connected state, receive from the network device receiving resource information, wherein the receiving resource information is used to indicate a receiving resource set; and

[00135] if the terminal device 300 is in the inactive state or the idle state, receive data sent from a third terminal device using a resource in the receiving resource set.

[00136] According to exemplary embodiments, the receiving unit 310 is configured to:

[00137] receive RRC signaling or a System Information Block (SIB) sent by the network device if the terminal device is in the connected state, wherein the RRC signaling and the SIB include the receiving resource information.

[00138] According to exemplary embodiments, the receiving unit 310 is configured to:

[00139] receive the SIB periodically broadcast by the network device if the terminal device is in the connected state.

[00140] According to exemplary embodiments, the dedicated transmission resource belongs to the receiving resource set.

[00141] According to exemplary embodiments, the dedicated transmission resource is used for a terminal device group to transmit data, the terminal device group includes at least two terminal devices, and the at least two terminal devices include the terminal device.

[00142] According to exemplary embodiments, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group, and only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

[00143] According to exemplary embodiments, a plurality of terminal devices in the terminal device group send data concurrently, and the plurality of terminal devices use different dedicated transmission resources to concurrently send data.

[00144] According to exemplary embodiments, the resource configuration information includes an identifier of the terminal device 300.

[00145] According to exemplary embodiments, the identifier of the first terminal device is used to indicate a source address by which the first terminal device sends data to the second terminal device.

[00146] It should be understood that the terminal device 300 according to the embodiments of the present disclosure may be configured to perform the method 100 in the embodiments of the present disclosure, and the foregoing and other operations and/or functions of respective units in the terminal device 300 are used to implement corresponding processes of the terminal devices in the methods described with reference to FIG. 1 and FIG. 2. For brevity, repeated descriptions are omitted herein.

[00147] The terminal device according to embodiments of the present disclosure receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured

by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00148] As shown in FIG. 4, the network device 400 according to an embodiment of the present disclosure includes a processing unit 410 and a sending unit 420.

[00149] The processing unit 410 is configured to, configure a dedicated transmission resource for a first terminal device. The dedicated transmission resource is used by the first terminal device to send data to a second terminal device if the first terminal device is in an inactive state or an idle state.

[00150] The sending unit 420 is configured to send resource configuration information to the first terminal device which is in a connected state. The resource configuration information is used to indicate the dedicated transmission resource.

[00151] The network device according to embodiments of the present disclosure may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00152] According to exemplary embodiments, the sending unit 420 is configured to:

[00153] send a Radio Resource Control (RRC) message to the first terminal device which is in the connected state, wherein the RRC message includes the resource configuration information.

[00154] According to exemplary embodiments, the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

[00155] According to exemplary embodiments, the sending unit 420 is further configured to:

[00156] send receiving resource information to the first terminal device which is in the connected state, wherein the receiving resource information is used to indicate a receiving resource set, and a resource in the receiving resource set is used for the first terminal device to receive data from a third terminal device if the first terminal device is in the inactive state or the idle state.

[00157] According to exemplary embodiments, the sending unit 420 is configured to:

[00158] send RRC signaling or a System Information Block (SIB) to the first terminal device which is in the connected state, wherein the RRC signaling and the SIB includes the receiving resource information.

[00159] According to exemplary embodiments, the sending unit 420 is configured to:

[00160] periodically broadcast the SIB.

[00161] According to exemplary embodiments, the processing unit 410 is configured to:

[00162] determine the dedicated transmission resource from the receiving resource set.

[00163] According to exemplary embodiments, the processing unit 410 is configured to:

[00164] configure the dedicated transmission resource for a terminal device group, wherein the terminal device group includes at least two terminal devices, and the at least two terminal devices include the first terminal device.

[00165] According to exemplary embodiments, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group;

[00166] the processing unit 410 is configured to:

[00167] configure the dedicated transmission resource for the terminal device group, wherein only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

[00168] According to exemplary embodiments, a plurality of terminal devices in the terminal device group send data concurrently;

[00169] the processing unit 410 is configured to:

[00170] configure a plurality of the dedicated transmission resources for the terminal device group, wherein the plurality of terminal devices use different dedicated transmission

resources in the a plurality of the dedicated transmission resources to concurrently send data.

[00171] According to exemplary embodiments, the processing unit 410 is configured to:

[00172] determine the dedicated transmission resource by negotiating with another network device, wherein the another network device and the network device are different network devices located in a same Radio Access Network (RAN) area.

[00173] According to exemplary embodiments, the resource configuration information includes an identifier of the first terminal device.

[00174] It should be understood that the network device 400 according to the embodiments of the present disclosure may be configured to perform the method 200 in the embodiments of the present disclosure, and the foregoing and other operations and/or functions of respective units in the network device 400 are used to implement corresponding processes of the network devices in the methods described with reference to FIG. 1 and FIG. 2. For brevity, repeated descriptions are omitted herein.

[00175] The network device according to embodiments of the present disclosure may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00176] FIG. 5 shows a schematic block diagram of a terminal device 500 according to an embodiment of the present disclosure. As shown in FIG. 5, the terminal device 500 includes a processor 510 and a transceiver 520. The processor 510 is connected to the transceiver 520. According to an exemplary embodiment, the terminal device 500 may further include a memory 530, and the memory 530 is connected to the processor 510. The processor 510, the memory 530, and the transceiver 520 communicate with each other through an internal connection path to transfer and/or control data signals. The memory 530 can be used

to store instructions, and the processor 510 is configured to execute the instructions in the memory 530 to control the transceiver 520 to send information or signals. The transceiver 520 is configured to: if the terminal device 500 is in a connected state, receive resource configuration information sent by a network device. The resource configuration information is used to indicate a dedicated transmission resource. The transceiver 520 is further configured to: if the terminal device 500 is in an inactive state or an idle state, send data to a second terminal device using the dedicated transmission resource.

[00177] The terminal device according to embodiments of the present disclosure receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00178] According to exemplary embodiments, the receiving unit 310 is configured to:

[00179] receive a Radio Resource Control (RRC) message sent by the network device if the terminal device is in the connected state, wherein the RRC message includes the resource configuration information.

[00180] According to exemplary embodiments, the RRC message is used to indicate that the terminal device transits from the connected state to the inactive state or the idle state.

[00181] According to exemplary embodiments, the receiving unit 310 is further configured to:

[00182] if the terminal device 500 is in the connected state, receive from the network device receiving resource information, wherein the receiving resource information is used to indicate a receiving resource set; and

[00183] if the terminal device 500 is in the inactive state or the idle state, receive data sent from a third terminal device using a resource in the receiving resource set.

[00184] According to exemplary embodiments, the receiving unit 310 is configured to:

[00185] receive RRC signaling or a System Information Block (SIB) sent by the

network device if the terminal device is in the connected state, wherein the RRC signaling and the SIB include the receiving resource information.

[00186] According to exemplary embodiments, the receiving unit 310 is configured to:

[00187] receive the SIB periodically broadcast by the network device if the terminal device 500 is in the connected state.

[00188] According to exemplary embodiments, the dedicated transmission resource belongs to the receiving resource set.

[00189] According to exemplary embodiments, the dedicated transmission resource is used for a terminal device group to transmit data, the terminal device group includes at least two terminal devices, and the at least two terminal devices include the terminal device 500.

[00190] According to exemplary embodiments, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group, and only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

[00191] According to exemplary embodiments, a plurality of terminal devices in the terminal device group send data concurrently, and the plurality of terminal devices use different dedicated transmission resources to concurrently send data.

[00192] According to exemplary embodiments, the resource configuration information includes an identifier of the terminal device 500.

[00193] According to exemplary embodiments, the identifier of the terminal device 500 is used to indicate a source address by which the first terminal device sends data to the second terminal device.

[00194] It should be understood that the terminal device 500 according to the embodiments of the present disclosure may correspond to the terminal device 300 in the embodiments of the present disclosure, and may be configured to perform the method 100 according to the embodiments of the present disclosure. The foregoing and other operations and/or functions of respective units in the terminal device 500 are used to implement corresponding processes of the terminal devices in the methods described with reference to FIG. 1 and FIG. 2. For brevity, repeated descriptions are omitted herein.

[00195] The terminal device according to embodiments of the present disclosure receives the dedicated transmission resource allocated by the network device if the terminal device is in the connected state, and uses the dedicated transmission resource to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00196] FIG. 6 shows a schematic block diagram of a network device 600 according to an embodiment of the present resource. As shown in FIG. 6, the network device 600 includes a processor 610 and a transceiver 620. The processor 610 is connected to the transceiver 620. According to an exemplary embodiment, the network device 600 also includes a memory 630. The memory 630 is coupled to the processor 610. The processor 610, the memory 630 and the transceiver 620 communicate with each other through an internal connection path to transfer and/or control data signals. The memory 630 can be used to store instructions, and the processor 610 is configured to execute the instructions in the memory 630 to control the transceiver 620 to send information or signals. The processor 610 is configured to: configure a dedicated transmission resource for a first terminal device, wherein the dedicated transmission resource is used by the first terminal device to send data to a second terminal device if the first terminal device is in an inactive state or an idle state. The transceiver 620 is configured to: send resource configuration information to the first terminal device which is in a connected state, wherein the resource configuration information is used to indicate the dedicated transmission resource.

[00197] The network device according to embodiments of the present disclosure may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The

embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00198] According to exemplary embodiments, the transceiver 620 is configured to:

[00199] send a Radio Resource Control (RRC) message to the first terminal device which is in the connected state, wherein the RRC message includes the resource configuration information.

[00200] According to exemplary embodiments, the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

[00201] According to exemplary embodiments, the transceiver 620 is further configured to:

[00202] send receiving resource information to the first terminal device which is in the connected state, wherein the receiving resource information is used to indicate a receiving resource set, and a resource in the receiving resource set is used for the first terminal device to receive data from a third terminal device if the first terminal device is in the inactive state or the idle state.

[00203] According to exemplary embodiments, the transceiver 620 is configured to:

[00204] send RRC signaling or a System Information Block (SIB) to the first terminal device which is in the connected state, wherein the RRC signaling and the SIB include the receiving resource information.

[00205] According to exemplary embodiments, the transceiver 620 is configured to:

[00206] periodically broadcast the SIB.

[00207] According to exemplary embodiments, the processor 610 is configured to:

[00208] determine the dedicated transmission resource from the receiving resource set.

[00209] According to exemplary embodiments, the processor 610 is configured to:

[00210] configure the dedicated transmission resource for a terminal device group, wherein the terminal device group includes at least two terminal devices, and the at least two terminal devices include the first terminal device.

[00211] According to exemplary embodiments, there is no concurrent data transmission by a plurality of terminal devices in the terminal device group; the processor

610 is configured to: configure the dedicated transmission resource for the terminal device group, wherein only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

[00212] According to exemplary embodiments, a plurality of terminal devices in the terminal device group send data concurrently; the processor 610 is configured to: configure a plurality of the dedicated transmission resources for the terminal device group, wherein the plurality of terminal devices use different dedicated transmission resources in the a plurality of the dedicated transmission resources to concurrently send data.

[00213] According to exemplary embodiments, the processor 610 is configured to:

[00214] determine the dedicated transmission resource by negotiating with another network device, wherein the another network device and the network device are different network devices located in a same Radio Access Network (RAN) area.

[00215] According to exemplary embodiments, the resource configuration information includes an identifier of the first terminal device.

[00216] It should be understood that the network device 600 according to the embodiments of the present disclosure may correspond to the network device 400 in the embodiments of the present disclosure, and may be configured to perform the method 200 according to the embodiments of the present disclosure. The foregoing and other operations and/or functions of respective units in the network device 600 are used to implement corresponding processes of the network devices in the methods described with reference to FIG. 1 and FIG. 2. For brevity, repeated descriptions are omitted herein.

[00217] The network device according to embodiments of the present disclosure may configure the dedicated transmission resource for the terminal device, and send the dedicated transmission resource to the terminal device if the terminal device is in the connected state, so that the terminal device may use the dedicated transmission to perform data transmission with other terminal devices if the terminal device is in the inactive state or the idle state. In this way, the terminal device can use the dedicated transmission resource configured by the network device even if the terminal device is in the inactive state or the idle state. The embodiments of the present disclosure can reduce energy consumption of the terminal device and enable the terminal device to enjoy the benefits of the dedicated resource.

[00218] It should be understood that the method embodiments of the present disclosure may be applied in one or more processors, or may be implemented by one or more processors. The processors in the embodiments of the present disclosure may be an integrated circuit chip which has signal processing capability. During implementation, each step of the foregoing method embodiments can be completed by an integrated hardware logic circuit in the processors or software instructions. Each of the above-described processors can be a general-purpose processor, a Digital Signal Processors (DSPs), an Application Specific Integrated Circuit (ASIC), a Field Programmable Gate Array (FPGA) or other programmable logic devices, discrete gates or transistor logic devices, discrete hardware components, which can implement or perform the methods, steps, and logical block diagrams disclosed in the embodiments of the present disclosure. The general-purpose processor can be a microprocessor or any conventional processor. The steps of the methods disclosed in the embodiments of the present disclosure can be directly completed by a hardware decoding processor, or by a combination of hardware and software modules in the decoding processor. The software modules can be located in a storage medium that is well-known in the art such as a random access memory, a flash memory, a read only memory, a programmable read only memory or an electrically erasable programmable memory, a register. The storage medium is located in the memory and the processor reads information in the memory and completes the steps of the above-described methods with its hardware.

[00219] It can be understood that the memory in the embodiments of the present disclosure can be a volatile memory or a non-volatile memory, or can include both volatile memory and non-volatile memory. The non-volatile memory can be a Read-Only Memory (ROM), a Programmable ROM (PROM), an Erasable PROM (EPROM), an Electrically EPROM (EEPROM) or a flash memory. The volatile memory can be a Random Access Memory (RAM) that serves as an external cache. By exemplary rather than limiting way, many forms of RAMs can be used, for example, a Static RAM (SRAM), a Dynamic RAM (DRAM), a Synchronous DRAM (SDRAM), a Double Data Rate SDRAM (DDR SDRAM), an Enhanced SDRAM (ESDRAM), a Synchlink DRAM (SLDRAM) and a Direct Rambus RAM (DR RAM). It should be noted that the memories in the systems and methods described herein are intended to include, but not limited to, these and any other suitable types of

memories.

[00220] Those of ordinary skill in the art will appreciate that the exemplary units and algorithm steps described according to the embodiments disclosed herein can be carried out by electronic hardware or a combination of electronic hardware and computer software. Whether the functions are implemented by hardware or software depends on particular applications and design constraints of the technical solutions. For each of the particular applications, a person skilled in the art can use different methods to implement the described functions, but such implementation should not be considered as beyond the scope of the present disclosure.

[00221] It may be clearly understood by those skilled in the art that details of specific operation procedures of the systems, devices and units can be found in the previous description regarding the method embodiments.

[00222] In the embodiments provided in the present disclosure, it should be understood that the disclosed systems, devices and methods may be implemented in other ways. For example, the device embodiments described above are merely illustrative. For example, the division of the units is only a kind of logical function division. In practice, other division manner may be used. For example, multiple units or components may be combined or integrated into another system, or some features may be ignored or not performed. In addition, the illustrated or discussed mutual coupling or direct coupling or communication connection may be indirect coupling or communication connection through some interfaces, devices or units, and may be in electrical, mechanical or other forms.

[00223] The units described as separated parts may or may not be physically separated, and the parts displayed as units may or may not be physical units, that is, the units may be located in one place, or may be distributed over multiple network units. Some or all of the units may be selected according to actual needs to achieve the objectives of the solutions in the embodiments.

[00224] In addition, the functional units in the embodiments of the present disclosure may be integrated in one processing unit, or the units may exist alone physically, or two or more units may be integrated in one unit.

[00225] The functions may also be stored in a computer-readable storage medium if

being implemented in the form of a software functional unit and sold or used as an independent product. Based on such understanding, the essence of the technical solutions of the present disclosure, or the part contributing to the prior art or part of the technical solutions, may be embodied in the form of a software product. The computer software product is stored in a storage medium including a number of instructions such that a computer device (which may be a personal computer, a server, or a network device, etc.) performs all or part of steps of the method described in each of the embodiments of the present disclosure. The foregoing storage medium includes: any medium that is capable of storing program codes such as a USB disk, a mobile hard disk, a Read-Only Memory (ROM), a Random Access Memory (RAM), a magnetic disk or an optical disk, and the like.

[00226] The foregoing descriptions are merely exemplary embodiments of the present disclosure, but the protection scope of the present disclosure is not limited thereto. Any person skilled in the art can easily think of changes or substitutions within the technical scope of the present disclosure, and all the changes or substitutions should be covered by the protection scope of the present disclosure. Therefore, the protection scope of the present disclosure should be defined by the appended claims.

WHAT IS CLAIMED IS:

1. A resource configuration method, comprising:

if a first terminal device is in a connected state, receiving resource configuration information sent by a network device, wherein the resource configuration information is used to indicate a dedicated transmission resource; and

if the first terminal device is in an inactive state or an idle state, sending data to a second terminal device using the dedicated transmission resource.

2. The method according to claim 1, wherein receiving resource configuration information sent by a network device comprises:

receiving, by the first terminal device, a Radio Resource Control (RRC) message sent by the network device, wherein the RRC message comprises the resource configuration information.

3. The method according to claim 2, wherein the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

4. The method according to any one of claims 1 to 3, further comprising:

if the first terminal device is in the connected state, receiving from the network device receiving resource information, wherein the receiving resource information is used to indicate a receiving resource set; and

if the first terminal device is in the inactive state or the idle state, receiving data sent from a third terminal device using a resource in the receiving resource set.

5. The method according to claim 4, wherein receiving from the network device receiving resource information, comprises:

receiving, by the first terminal device, RRC signaling or a System Information Block (SIB) sent by the network device, wherein the RRC signaling and the SIB comprise the receiving resource information.

6. The method according to claim 5, wherein receiving, by the first terminal device, RRC signaling or a SIB sent by the network device comprises:

receiving, by the first terminal device, the SIB periodically broadcast by the network device.

7. The method according to any one of claims 4 to 6, wherein the dedicated transmission resource belongs to the receiving resource set.

8. The method according to any one of claims 1 to 7, wherein the dedicated transmission resource is used for a terminal device group to transmit data, the terminal device group comprises at least two terminal devices, and the at least two terminal devices comprise the first terminal device.

9. The method according to claim 8, wherein there is no concurrent data transmission by a plurality of terminal devices in the terminal device group, and only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

10. The method according to claim 8, wherein a plurality of terminal devices in the terminal device group send data concurrently, and the plurality of terminal devices use different dedicated transmission resources to concurrently send data.

11. The method according to any one of claims 1 to 10, wherein the resource configuration information comprises an identifier of the first terminal device.

12. The method according to claim 11, wherein the identifier of the first terminal device is used to indicate a source address by which the first terminal device sends data to the second terminal device.

13. A resource configuration method, comprising:

configuring, by a network device, a dedicated transmission resource for a first terminal device, wherein the dedicated transmission resource is used by the first terminal device to send data to a second terminal device if the first terminal device is in an inactive state or an idle state; and

sending, by the network device, resource configuration information to the first terminal device which is in a connected state, wherein the resource configuration information is used to indicate the dedicated transmission resource.

14. The method according to claim 13, wherein sending, by the network device, resource configuration information to the first terminal device which is in a connected state, comprises:

sending, by the network device, a Radio Resource Control (RRC) message to the first terminal device which is in the connected state, wherein the RRC message comprises the resource configuration information.

15. The method according to claim 14, wherein the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or the idle state.

16. The method according to any one of claims 13 to 15, further comprising:

sending, by the network device, receiving resource information to the first terminal device which is in the connected state, wherein the receiving resource information is used to indicate a receiving resource set, and a resource in the receiving resource set is used for the first terminal device to receive data from a third terminal device if the first terminal device is in the inactive state or the idle state.

17. The method according to claim 16, wherein sending, by the network device, receiving resource information to the first terminal device which is in the connected state, comprises:

sending, by the first terminal device, RRC signaling or a System Information Block (SIB) to the first terminal device which is in the connected state, wherein the RRC signaling and the

SIB comprise the receiving resource information.

18. The method according to claim 17, wherein sending, by the first terminal device, RRC signaling or a SIB to the first terminal device which is in the connected state, comprises:

periodically broadcasting the SIB by the network device.

19. The method according to any one of claims 16 to 18, wherein configuring, by a network device, a dedicated transmission resource for a first terminal device, comprises:

determining, by the network device, the dedicated transmission resource from the receiving resource set.

20. The method according to any one of claims 13 to 18, wherein configuring, by a network device, a dedicated transmission resource for a first terminal device, comprises:

configuring, by the network device, the dedicated transmission resource for a terminal device group, wherein the terminal device group comprises at least two terminal devices, and the at least two terminal devices comprise the first terminal device.

21. The method according to claim 20, wherein there is no concurrent data transmission by a plurality of terminal devices in the terminal device group;

wherein configuring, by the network device, the dedicated transmission resource for a terminal device group, comprises:

configuring, by the network device, the dedicated transmission resource for the terminal device group, wherein only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

22. The method according to claim 20, wherein a plurality of terminal devices in the terminal device group send data concurrently;

wherein configuring, by the network device, the dedicated transmission resource for a terminal device group, comprises:

configuring, by the network device, a plurality of the dedicated transmission resources for the terminal device group, wherein the plurality of terminal devices use different dedicated transmission resources in the plurality of the dedicated transmission resources to concurrently send data.

23. The method according to any one of claims 13 to 18, wherein configuring, by a network device, a dedicated transmission resource for a first terminal device, comprises:

determining, by the network device, the dedicated transmission resource by negotiating with another network device, wherein the another network device and the network device are different network devices located in a same Radio Access Network (RAN) area.

24. The method according to any one of the claims 13 to 23, wherein the resource configuration information comprises an identifier of the first terminal device.

25. A terminal device, comprising:

a receiving unit configured to, if the terminal device is in a connected state, receive resource configuration information sent by a network device, wherein the resource configuration information is used to indicate a dedicated transmission resource; and

a sending unit configured to, if the terminal device is in an inactive state or an idle state, send data to a second terminal device using the dedicated transmission resource.

26. The terminal device according to claim 25, wherein the receiving unit is configured to:

receive a Radio Resource Control (RRC) message sent by the network device if the terminal device is in the connected state, wherein the RRC message comprises the resource configuration information.

27. The terminal device according to claim 26, wherein the RRC message is used to indicate that the terminal device transits from the connected state to the inactive state or the idle state.

28. The terminal device according to any one of claims 25 to 27, wherein the receiving unit is further configured to:

if the terminal device is in the connected state, receive from the network device receiving resource information, wherein the receiving resource information is used to indicate a receiving resource set; and

if the terminal device is in the inactive state or the idle state, receive data sent from a third terminal device using a resource in the receiving resource set.

29. The terminal device according to claim 28, wherein the receiving unit is configured to:

receive RRC signaling or a System Information Block (SIB) sent by the network device if the terminal device is in the connected state, wherein the RRC signaling and the SIB comprise the receiving resource information.

30. The terminal device according to claim 29, wherein the receiving unit is configured to:

receive the SIB periodically broadcast by the network device if the terminal device is in the connected state.

31. The terminal device according to any one of claims 28 to 30, wherein the dedicated transmission resource belongs to the receiving resource set.

32. The terminal device according to any one of claims 25 to 31, wherein the dedicated transmission resource is used for a terminal device group to transmit data, the terminal device group comprises at least two terminal devices, and the at least two terminal devices comprise the terminal device.

33. The terminal device according to claim 32, wherein there is no concurrent data transmission by a plurality of terminal devices in the terminal device group, and only one of

the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

34. The terminal device according to claim 32, wherein a plurality of terminal devices in the terminal device group send data concurrently, and the plurality of terminal devices use different dedicated transmission resources to concurrently send data.

35. The terminal device according to any one of claims 25 to 34, wherein the resource configuration information comprises an identifier of the terminal device.

36. The terminal device according to claim 35, wherein the identifier of the terminal device is used to indicate a source address by which the first terminal device sends data to the second terminal device.

37. A network device, comprising:

a processing unit configured to, configure a dedicated transmission resource for a first terminal device, wherein the dedicated transmission resource is used by the first terminal device to send data to a second terminal device if the first terminal device is in an inactive state or an idle state; and

a sending unit configured to send resource configuration information to the first terminal device which is in a connected state, wherein the resource configuration information is used to indicate the dedicated transmission resource.

38. The network device according to claim 37, wherein the sending unit is configured to: send a Radio Resource Control (RRC) message to the first terminal device which is in the connected state, wherein the RRC message comprises the resource configuration information.

39. The network device according to claim 38, wherein the RRC message is used to indicate that the first terminal device transits from the connected state to the inactive state or

the idle state.

40. The network device according to any one of claims 37 to 39, wherein the sending unit is further configured to:

send receiving resource information to the first terminal device which is in the connected state, wherein the receiving resource information is used to indicate a receiving resource set, and a resource in the receiving resource set is used for the first terminal device to receive data from a third terminal device if the first terminal device is in the inactive state or the idle state.

41. The network device according to claim 40, wherein the sending unit is configured to:

send RRC signaling or a System Information Block (SIB) to the first terminal device which is in the connected state, wherein the RRC signaling and the SIB comprise the receiving resource information.

42. The network device according to claim 41, wherein the sending unit is configured to: periodically broadcast the SIB.

43. The network device according to any one of claims 40 to 42, wherein the processing unit is configured to:

determine the dedicated transmission resource from the receiving resource set.

44. The network device according to any one of claims 37 to 42, wherein the processing unit is configured to:

configure the dedicated transmission resource for a terminal device group, wherein the terminal device group comprises at least two terminal devices, and the at least two terminal devices comprise the first terminal device.

45. The network device according to claim 44, wherein there is no concurrent data transmission by a plurality of terminal devices in the terminal device group;

wherein the processing unit is configured to:

configure the dedicated transmission resource for the terminal device group, wherein only one of the terminal devices in the terminal device group is allowed to send data at a time using the dedicated transmission resource.

46. The network device according to claim 44, wherein a plurality of terminal devices in the terminal device group send data concurrently;

wherein the processing unit is configured to:

configure a plurality of the dedicated transmission resources for the terminal device group, wherein the plurality of terminal devices use different dedicated transmission resources in the a plurality of the dedicated transmission resources to concurrently send data.

47. The network device according to any one of claims 37 to 42, wherein the processing unit is configured to:

determine the dedicated transmission resource by negotiating with another network device, wherein the another network device and the network device are different network devices located in a same Radio Access Network (RAN) area.

48. The network device according to any one of the claims 37 to 47, wherein the resource configuration information comprises an identifier of the first terminal device.