

TRANSMISSION DIRECTION DETERMINING METHOD AND APPARATUS, TRANSMISSION CHANNEL DETERMINING METHOD AND APPARATUS, AND COMPUTER STORAGE MEDIUM

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Technical Field

This application relates to the field of wireless communications technologies, and in particular, to a transmission direction determining method and apparatus, a transmission channel determining method and apparatus, and a computer storage medium.

10 Related Art

In a New Radio (NR) system, a slot or a symbol is used as a scheduling unit. Each slot includes 14 Orthogonal Frequency Division Multiplexing (OFDM) symbols. The NR system has a flexible frame structure. One slot may include a downlink (DL) symbol, an uplink (UL) symbol, and a flexible symbol. The flexible symbol is also referred to as an
15 unknown symbol and may be rewritten by using signaling for DL transmission or UL transmission.

In the NR system, a base station may use various manners to explicitly or implicitly indicate a transmission direction in a symbol in a slot. However, different configuration signaling may indicate different transmission directions (or transmission channels). When a
20 transmission direction (or transmission channel) configured by cell-specific radio resource control (RRC) signaling is different from a transmission direction (or transmission channel) indicated by another type of configuration signaling, how to determine a transmission direction (or transmission channel) is a problem to be resolved.

SUMMARY

25 Embodiments of this application provide a transmission direction determining method and apparatus, a transmission channel determining method and apparatus, and a computer storage medium.

Embodiments of this application provide a transmission direction determining method, including:

receiving, by a terminal, first configuration signaling, and determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction, where the first configuration signaling is cell-specific RRC signaling;

receiving, by the terminal, second configuration signaling, and determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction; and

determining, by the terminal, a direction of the target resource as the first transmission direction, and performing data transmission with a network device based on the first transmission direction.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or user equipment (UE)-specific RRC signaling.

In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or system information (SI).

In the embodiments of this application, the dynamic scheduling signaling is downlink control information (DCI) and/or a media access control (MAC) control element (CE).

In the embodiments of this application, the determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction includes:

determining, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction; and

the determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction includes:

determining, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a DL transmission direction and/or a flexible transmission

direction.

In the embodiments of this application, the determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction includes:

- 5 determining, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction; and

the determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction includes:

- 10 determining, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a UL transmission direction and/or a flexible transmission direction.

In the embodiments of this application, the determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction includes:

- 15 determining, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction; and

the determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction includes:

- 20 determining, based on the dynamic scheduling signaling, that the target resource corresponds to a DL transmission direction.

In the embodiments of this application, the determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction includes:

- 25 determining, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction; and

the determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction includes:

determining, based on the dynamic scheduling signaling, that the target resource corresponds to a UL transmission direction.

In the embodiments of this application, the determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction includes:

determining, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction; and

the determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction includes:

determining, based on the UE-specific RRC signaling, that the target resource corresponds to a DL transmission direction.

In the embodiments of this application, the determining, based on the first configuration signaling, that a target resource corresponds to a first transmission direction includes:

determining, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction; and

the determining, based on the second configuration signaling, that the target resource corresponds to a second transmission direction includes:

determining, based on the UE-specific RRC signaling, that the target resource corresponds to a UL transmission direction.

In the embodiments of this application, the determining, by the terminal, a direction of the target resource as the first transmission direction, and performing data transmission with a network device based on the first transmission direction includes:

determining, by the terminal, the direction of the target resource as a UL transmission direction, and sending UL data on the target resource.

In the embodiments of this application, the determining, by the terminal, a direction of the target resource as the first transmission direction, and performing data transmission

with a network device based on the first transmission direction includes:

determining, by the terminal, the direction of the target resource as a DL transmission direction, and receiving DL data on the target resource.

In the embodiments of this application, the target resource includes one or more
5 symbols.

Embodiments of this application provide a transmission direction determining method, including:

configuring and sending, by a network device, first configuration signaling, where the first configuration signaling is used to indicate that a target resource corresponds to a first
10 transmission direction, and the first configuration signaling is cell-specific RRC signaling;

configuring and sending, by the network device, second configuration signaling, where the second configuration signaling is used to indicate that the target resource corresponds to a second transmission direction; and

performing, by the network device, data transmission with a terminal based on the first
15 transmission direction.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In the embodiments of this application, the semi-static UL/DL configuration signaling
20 is RRC signaling or SI.

In the embodiments of this application, the dynamic scheduling signaling is DCI and/or a MAC CE.

In the embodiments of this application, if the second configuration signaling is the semi-static UL/DL configuration signaling, the configuring, by the network device, second
25 configuration signaling includes:

configuring, by the network device, the second configuration signaling based on the first configuration signaling,

where if data configured by the first configuration signaling is UL data, a transmission direction is configured as a UL transmission direction or a flexible transmission direction on a target resource, corresponding to the UL data, in the second configuration signaling; or if the data configured by the first configuration signaling is DL data, a transmission
 5 direction is configured as a DL transmission direction or a flexible transmission direction on a target resource, corresponding to the DL data, in the second configuration signaling.

In the embodiments of this application, the target resource includes one or more symbols.

Embodiments of this application provide a transmission direction determining
 10 apparatus, including:

a first receiving unit, configured to receive first configuration signaling;

a first determining unit, configured to determine, based on the first configuration signaling, that a target resource corresponds to a first transmission direction, where the first configuration signaling is cell-specific RRC signaling;

15 a second receiving unit, configured to receive second configuration signaling;

a second determining unit, configured to determine, based on the second configuration signaling, that the target resource corresponds to a second transmission direction;

a third determining unit, configured to determine a direction of the target resource as the first transmission direction; and

20 a transmission unit, configured to perform data transmission with a network device based on the first transmission direction.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

25 In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the embodiments of this application, the dynamic scheduling signaling is DCI and/or

a MAC CE.

In the embodiments of this application, the first determining unit is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction; and

5 the second determining unit is configured to determine, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a DL transmission direction and/or a flexible transmission direction.

In the embodiments of this application, the first determining unit is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to
10 a DL transmission direction; and

the second determining unit is configured to determine, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a UL transmission direction and/or a flexible transmission direction.

In the embodiments of this application, the first determining unit is configured to
15 determine, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction; and

the second determining unit is configured to determine, based on the dynamic scheduling signaling, that the target resource corresponds to a DL transmission direction.

In the embodiments of this application, the first determining unit is configured to
20 determine, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction; and

the second determining unit is configured to determine, based on the dynamic scheduling signaling, that the target resource corresponds to a UL transmission direction.

In the embodiments of this application, the first determining unit is configured to
25 determine, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction; and

the second determining unit is configured to determine, based on the UE-specific RRC

signaling, that the target resource corresponds to a DL transmission direction.

In the embodiments of this application, the first determining unit is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction; and

- 5 the second determining unit is configured to determine, based on the UE-specific RRC signaling, that the target resource corresponds to a UL transmission direction.

In the embodiments of this application, the third determining unit is configured to determine the direction of the target resource as a UL transmission direction; and

the transmission unit is configured to send UL data on the target resource.

- 10 In the embodiments of this application, the third determining unit is configured to determine a direction of the target resource as a DL transmission direction; and

the transmission unit is configured to receive DL data on the target resource.

In the embodiments of this application, the target resource includes one or more symbols.

- 15 Embodiments of this application provide a transmission direction determining apparatus, including:

a first configuration unit, configured to configure and send first configuration signaling, where the first configuration signaling is used to indicate that a target resource corresponds to a first transmission direction, and the first configuration signaling is cell-specific RRC signaling;

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a second configuration unit, configured to configure and send second configuration signaling, where the second configuration signaling is used to indicate that the target resource corresponds to a second transmission direction; and

- a transmission unit, configured to perform data transmission with a terminal based on the first transmission direction.

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In the embodiments of this application, the second configuration signaling is

semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or SI.

- 5 In the embodiments of this application, the dynamic scheduling signaling is DCI and/or a MAC CE.

In the embodiments of this application, if the second configuration signaling is the semi-static UL/DL configuration signaling, the second configuration unit is configured to configure the second configuration signaling based on the first configuration signaling,

- 10 where if data configured by the first configuration signaling is UL data, a transmission direction is configured as a UL transmission direction or a flexible transmission direction on a target resource, corresponding to the UL data, in the second configuration signaling, or if the data configured by the first configuration signaling is DL data, a transmission direction is configured as a DL transmission direction or a flexible transmission direction
15 on a target resource, corresponding to the DL data, in the second configuration signaling.

In the embodiments of this application, the target resource includes one or more symbols.

Embodiments of this application provide a transmission channel determining method, including:

- 20 receiving, by a terminal, first configuration signaling, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling;

- receiving, by the terminal, second configuration signaling, where the second configuration signaling is used to determine to transmit a second channel on the target
25 resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel; and

transmitting, by the terminal, the first channel on the target resource.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

5 In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the embodiments of this application, the dynamic scheduling signaling is DCI and/or a MAC CE.

In the embodiments of this application, the transmitting the first channel on the target resource includes:

10 receiving, by the terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

sending, by the terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

15 In the embodiments of this application, the transmitting the second channel on the target resource includes:

receiving, by the terminal, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

sending, by the terminal, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

20 In the embodiments of this application, the transmitting, by the terminal, the first channel on the target resource includes:

receiving, by the terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

25 sending, by the terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

In the embodiments of this application, the target resource includes one or more time

domain symbols.

Embodiments of this application provide a transmission channel determining method, including:

5 sending, by a network device, first configuration signaling to a terminal, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling;

10 sending, by the network device, second configuration signaling to the terminal, where the second configuration signaling is used to determine to transmit a second channel on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel; and

transmitting, by the network device, the first channel on the target resource.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

15 In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the embodiments of this application, the dynamic scheduling signaling is DCI and/or a MAC CE.

20 In the embodiments of this application, the transmitting the first channel on the target resource includes:

sending, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

receiving, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

25 In the embodiments of this application, the transmitting the second channel on the target resource includes:

sending, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

receiving, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

5 In the embodiments of this application, the transmitting, by the network device, the first channel on the target resource includes:

sending, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

10 receiving, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

In the embodiments of this application, the target resource includes one or more time domain symbols.

Embodiments of this application provide a transmission channel determining apparatus, including:

15 a first determining unit, configured to receive first configuration signaling, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling;

a second determining unit, configured to receive second configuration signaling, where the second configuration signaling is used to determine to transmit a second channel on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel; and

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a transmission unit, configured to transmit the first channel on the target resource.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

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In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the embodiments of this application, the dynamic scheduling signaling is DCI and/or a MAC CE.

In the embodiments of this application, the transmitting the first channel on the target resource includes:

5 receiving, by the terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

sending, by the terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

10 In the embodiments of this application, the transmitting the second channel on the target resource includes:

receiving, by the terminal, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

sending, by the terminal, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

15 In the embodiments of this application, the transmission unit receives the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

the transmission unit sends the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

20 In the embodiments of this application, the target resource includes one or more time domain symbols.

Embodiments of this application provide a transmission channel determining apparatus, including:

25 a first sending unit, configured to send first configuration signaling to a terminal, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling;

a second sending unit, configured to send second configuration signaling to the terminal, where the second configuration signaling is used to determine to transmit a second channel on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel;

5 and

a transmission unit, configured to transmit the first channel on the target resource.

In the embodiments of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

10 In the embodiments of this application, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the embodiments of this application, the dynamic scheduling signaling is DCI and/or a MAC CE.

15 In the embodiments of this application, the transmitting the first channel on the target resource includes:

sending, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

receiving, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

20 In the embodiments of this application, the transmitting the second channel on the target resource includes:

sending, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

25 receiving, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

In the embodiments of this application, the transmission unit sends the first channel on the target resource if the transmission direction corresponding to the first channel is a DL

direction; or

the transmission unit receives the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

5 In the embodiments of this application, the target resource includes one or more time domain symbols.

Embodiments of this application provide a computer storage medium, storing a computer executable instruction thereon, where the computer executable instruction is executed by a processor to implement the foregoing transmission direction determining method.

10 In the technical solutions of the embodiments of this application, a terminal receives first configuration signaling, and determines, based on the first configuration signaling, that a target resource corresponds to a first transmission direction, where the first configuration signaling is cell-specific RRC signaling; the terminal receives second configuration signaling, and determines, based on the second configuration signaling, that the target
15 resource corresponds to a second transmission direction; and the terminal determines a direction of the target resource as the first transmission direction, and performs data transmission with a network device based on the first transmission direction. In the technical solutions of the embodiments of this application, when a direction of cell-specific RRC signaling configured transmission is different from a transmission direction indicated
20 by another type of configuration signaling, the terminal determines a transmission direction according to a principle that cell-specific RRC signaling has a higher priority, thereby avoiding an error that occurs when the terminal receives configuration signaling with two different transmission directions.

BRIEF DESCRIPTION OF THE DRAWINGS

25 The accompanying drawings described herein are used for providing further understanding for this application and constitute a part of this application. Exemplary embodiments of this application and descriptions thereof are used for explaining this application and do not constitute an improper limitation to this application. In the

accompanying drawings:

FIG. 1 is a schematic flowchart 1 of a transmission direction determining method according to an embodiment of this application;

5 FIG. 2 is a schematic flowchart 2 of a transmission direction determining method according to an embodiment of this application;

FIG. 3 is a schematic structural diagram 1 of a transmission direction determining apparatus according to an embodiment of this application;

FIG. 4 is a schematic structural diagram 2 of a transmission direction determining apparatus according to an embodiment of this application;

10 FIG. 5 is a schematic flowchart 1 of a transmission channel determining method according to an embodiment of this application;

FIG. 6 is a schematic flowchart 2 of a transmission channel determining method according to an embodiment of this application;

15 FIG. 7 is a schematic structural diagram 1 of a transmission channel determining apparatus according to an embodiment of this application;

FIG. 8 is a schematic structural diagram 2 of a transmission channel determining apparatus according to an embodiment of this application; and

FIG. 9 is a schematic structural diagram of a computer device according to an embodiment of this application.

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DETAILED DESCRIPTION

For ease of understanding of the technical solutions in the embodiments of this application, related configuration signaling in the embodiments of this application are described below.

25 1) Semi-static UL/DL configuration signaling is used to implement semi-static UL/DL configuration. Specifically, a slot format within a configuration period (for example, 5 ms or 10 ms) is configured by using semi-static RRC signaling. The slot format may indicate

quantities and positions of UL symbols, DL symbols, and flexible symbols in each slot within one configuration period.

Further, the semi-static UL/DL configuration signaling includes the following two cases.

5 1.1) Common semi-static UL/DL configuration signaling is used to implement semi-static UL/DL common configuration, which is also referred to as cell-specific semi-static UL/DL configuration.

1.2) Dedicated semi-static UL/DL configuration signaling is used to implement semi-static UL/DL dedicated configuration, which is also referred to as UE-specific
10 semi-static UL/DL configuration.

2) Dynamic slot format indication signaling is used to implement a dynamic slot format indication. Specifically, the dynamic slot format indication signaling is carried in a group common PDCCH to be sent, and is used to dynamically indicate a slot format of each slot.

15 Further, the dynamic slot format indication signaling has the following two indication manners:

2.1) The dynamic slot format indication signaling indicates a direction in each symbol in each slot.

2.2) In combination with semi-static UL/DL configuration, the dynamic slot format
20 indication signaling can only change a direction in a flexible symbol in the semi-static UL/DL configuration but cannot change a direction in a UL symbol and a direction in a DL symbol in the semi-static UL/DL configuration.

3) Dynamic scheduling signaling is used to implement dynamically scheduled data transmission. For example, data transmission scheduled by DCI is physical downlink
25 shared channel (PDSCH)/physical uplink shared channel (PUSCH) transmission or physical uplink control channel (PUCCH) transmission that carries an acknowledgement (ACK)/negative-acknowledgement (NACK). For another example, measurement signal transmission scheduled by DCI is aperiodic channel state information (CSI)-reference

signal (RS) transmission or aperiodic sounding reference signal (SRS) transmission. The data transmission or measurement signal transmission scheduled by DCI implicitly indicates whether its corresponding symbol is a DL symbol or a UL symbol.

4) UE-specific RRC signaling is used to implement UE-specific RRC signaling configured transmission, for example, periodic measurement signal transmission or physical random access channel (PRACH) transmission. UE-specific RRC signaling configured transmission also implicitly indicates whether its corresponding symbol is a DL symbol or a UL symbol. For example, a symbol corresponding to a periodic CSI-RS is a DL symbol, a symbol corresponding to a periodic SRS is a UL symbol, and a symbol corresponding to a PRACH is a UL symbol.

5) Cell-specific RRC signaling is used to implement cell-specific RRC signaling configured transmission, for example, transmission of SI such as remaining minimum SI (RMSI) or other SI (OSI). Cell-specific RRC signaling configured transmission similarly implicitly indicates whether its corresponding symbol is a DL symbol or a UL symbol.

15 A base station may explicitly or implicitly indicate a transmission direction in a symbol in a slot by using the foregoing configuration signaling. However, different configuration signaling may indicate different transmission directions. Based on this, the embodiments of this application provide the following technical solutions.

FIG. 1 is a schematic flowchart 1 of a transmission direction determining method according to an embodiment of this application. As shown in FIG. 1, the transmission direction determining method includes the following steps.

Step 101: A terminal receives first configuration signaling, and determines, based on the first configuration signaling, that a target resource corresponds to a first transmission direction, where the first configuration signaling is cell-specific RRC signaling.

25 Herein, the terminal may be a device capable of accessing a communication network, for example, a mobile phone, a tablet computer or a notebook computer.

In this embodiment of this application, the first configuration signaling is cell-specific RRC signaling. Cell-specific RRC signaling configured transmission implicitly indicates

whether its corresponding symbol is a UL symbol or a DL symbol. For example, the following information is configured in cell-specific RRC signaling: If UL data is transmitted in the first symbol to the fourth symbol in a slot, a transmission direction in the first symbol to the fourth symbol in the slot is a UL transmission direction. For another
 5 example, the following information is configured in cell-specific RRC signaling: If DL data is transmitted in the third symbol to the eighth symbol in the slot, a transmission direction in the third symbol to the eighth symbol in the slot is a DL transmission direction. It can be seen that the cell-specific RRC signaling can determine quantities and locations of symbols occupied by data in a slot, and a UL/DL type of the data implicitly indicates a transmission
 10 direction in the symbols occupied by the data.

In this embodiment of this application, the target resource is at least one time domain symbol that is configured for data by the cell-specific RRC signaling. The UL/DL type of the data implicitly indicates the transmission direction of the target resource. In this embodiment of this application, the transmission direction implicitly indicated by the
 15 cell-specific RRC signaling is referred to as the first transmission direction.

Step 102: The terminal receives second configuration signaling, and determines, based on the second configuration signaling, that the target resource corresponds to a second transmission direction.

In this embodiment of this application, the second configuration signaling is semi-static
 20 UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In the foregoing solution, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the foregoing solution, the dynamic scheduling signaling is DCI and/or a MAC CE.

25 1) The second configuration signaling is the semi-static UL/DL configuration signaling.

Herein, the semi-static UL/DL configuration signaling may be common semi-static UL/DL configuration signaling or dedicated semi-static UL/DL configuration signaling.

A slot format within a configuration period (for example, 5 ms or 10 ms) may be configured by using the semi-static UL/DL configuration signaling. Quantities and locations of UL symbols, DL symbols, and flexible symbols in each slot within a configuration period may be indicated by the slot format.

- 5 The semi-static UL/DL configuration signaling may explicitly indicate a transmission direction in each symbol in the slot, for example, a UL transmission direction, a DL transmission direction, and a flexible transmission direction.

10 Herein, a transmission direction in the flexible symbol is referred to as a flexible transmission direction. A symbol having a flexible transmission direction (that is, the flexible symbol) may be rewritten by using signaling for DL transmission or UL transmission. For example, a flexible transmission direction in a symbol is changed into a DL/UL direction by DCI.

2) The second configuration signaling is dynamic scheduling signaling.

15 Herein, dynamic scheduling signaling configured transmission implicitly indicates whether its corresponding symbol is a UL symbol or a DL symbol. The UL symbol represents that the transmission direction in the symbol is a UL transmission direction, and the DL symbol represents that the transmission direction in the symbol is a DL transmission direction.

3) The second configuration signaling is UE-specific RRC signaling.

20 Herein, UE-specific RRC signaling configured transmission implicitly indicates whether its corresponding symbol is a UL symbol or a DL symbol. The UL symbol represents that the transmission direction in the symbol is a UL transmission direction, and the DL symbol represents that the transmission direction in the symbol is a DL transmission direction.

25 Step 103: The terminal determines a direction of the target resource as the first transmission direction, and performs data transmission with a network device based on the first transmission direction.

The technical solutions of this embodiment of this application are respectively

described below with reference to different implementations of the second configuration signaling.

1) It is determined, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction, and it is determined, based on the semi-static
5 UL/DL configuration signaling, that the target resource corresponds to a DL transmission direction and/or a flexible transmission direction. In this case, the terminal determines the direction of the target resource as a UL transmission direction, and sends UL data on the target resource.

2) It is determined, based on the cell-specific RRC signaling, that the target resource
10 corresponds to a DL transmission direction, and it is determined, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a UL transmission direction and/or a flexible transmission direction. In this case, the terminal determines the direction of the target resource as a DL transmission direction, and receives DL data on the target resource.

3) It is determined, based on the cell-specific RRC signaling, that the target resource
15 corresponds to a UL transmission direction, and it is determined, based on the dynamic scheduling signaling, that the target resource corresponds to a DL transmission direction. In this case, the terminal determines the direction of the target resource as a UL transmission direction, and sends UL data on the target resource.

4) It is determined, based on the cell-specific RRC signaling, that the target resource
20 corresponds to a DL transmission direction, and it is determined, **based on** the dynamic scheduling signaling, that the target resource corresponds to a UL transmission direction. The terminal determines the direction of the target resource as a DL transmission direction, and receives DL data on the target resource.

5) It is determined, based on the cell-specific RRC signaling, that the target resource
25 corresponds to a UL transmission direction, and it is determined, based on the UE-specific RRC signaling, that the target resource corresponds to a DL transmission direction. In this case, the terminal determines the direction of the target resource as a UL transmission

direction, and sends UL data on the target resource.

6) It is determined, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction, and it is determined, **based on** the UE-specific RRC signaling, that the target resource corresponds to a UL transmission direction. The terminal determines the direction of the target resource as a DL transmission direction, and receives DL data on the target resource.

In the foregoing solution, the target resource includes one or more symbols.

In the technical solutions of the embodiments of this application, when a direction of cell-specific RRC signaling configured transmission is different from a transmission direction indicated by another type of configuration signaling, the terminal determines a transmission direction according to a principle that cell-specific RRC signaling has a higher priority, thereby avoiding an error that occurs when the terminal receives configuration signaling with two different transmission directions.

FIG. 2 is a schematic flowchart 2 of a transmission direction determining method according to an embodiment of this application. As shown in FIG. 2, the transmission direction determining method includes the following steps.

Step 201: A network device configures and sends first configuration signaling, where the first configuration signaling is used to indicate that a target resource corresponds to a first transmission direction, and the first configuration signaling is cell-specific RRC signaling.

Step 202: The network device configures and sends second configuration signaling, where the second configuration signaling is used to indicate that the target resource corresponds to a second transmission direction.

In this embodiment of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In the foregoing solution, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the foregoing solution, the dynamic scheduling signaling is DCI and/or a MAC CE.

In this embodiment of this application, if the second configuration signaling is the semi-static UL/DL configuration signaling, the configuring, by the network device, second configuration signaling includes:

5 configuring, by the network device, the second configuration signaling based on the first configuration signaling,

 where if data configured by the first configuration signaling is UL data, a transmission direction is configured as a UL transmission direction or a flexible transmission direction on a target resource, corresponding to the UL data, in the second configuration signaling; or
10 if the data configured by the first configuration signaling is DL data, a transmission direction is configured as a DL transmission direction or a flexible transmission direction on a target resource, corresponding to the DL data, in the second configuration signaling.

 Herein, the target resource includes one or more symbols.

 Step 203: The network device performs data transmission with a terminal based on the
15 first transmission direction.

In this embodiment of this application, the network device corresponds to a terminal side, and data transmission needs to be performed with the terminal based on the first transmission direction.

 The technical solutions of this embodiment of this application are further described
20 below with reference to specific application examples.

 Application example 1:

 Cell-specific RRC signaling configured transmission and semi-static UL/DL configuration signaling configured transmission. Specifically, a base station indicates a data transmission direction by using cell-specific RRC signaling configured transmission. In
25 addition, the base station can also indicate that a direction of a symbol in a slot is UL/DL or flexible by using the semi-static UL/DL configuration signaling.

 If cell-specific RRC signaling configured transmission indicates that the transmission

direction is DL, the DL data can only be transmitted in a DL symbol or a flexible symbol in a semi-static UL/DL configuration.

If cell-specific RRC signaling configured transmission indicates that the transmission direction is UL, the UL data can only be transmitted in a UL symbol or a flexible symbol in a semi-static UL/DL configuration.

The terminal does not expect that a transmission direction in a symbol in cell-specific RRC signaling configured transmission is opposite a transmission direction in a symbol indicated by the semi-static UL/DL configuration signaling. For example, a direction of cell-specific RRC signaling configured transmission is DL, while the semi-static UL/DL configuration signaling indicates that a direction of a symbol is UL; or a direction of cell-specific RRC signaling configured transmission is UL, while the semi-static UL/DL configuration signaling indicates that a direction of a symbol is DL.

If the transmission direction in a symbol in cell-specific RRC signaling configured transmission is opposite the transmission direction in a symbol indicated by the semi-static UL/DL configuration signaling, the terminal determines that the transmission direction is the direction indicated by the cell-specific RRC signaling.

Application example 2:

Cell-specific RRC signaling configured transmission and dynamic scheduling signaling configured transmission. Specifically, a base station indicates a data transmission direction by using cell-specific RRC signaling configured transmission. The base station may also perform data transmission by means of dynamic scheduling signaling. The data transmission corresponds to a fixed transmission direction. For example, a PDSCH scheduled by DCI is DL transmission, and a PUSCH scheduled by DCI or a PUCCH carrying an ACK/NACK is UL transmission. For another example, a symbol of non-periodic CSI-RS transmission scheduled by DCI is a DL symbol, and a symbol of non-periodic SRS transmission scheduled by DCI is a UL symbol.

If cell-specific RRC signaling configured transmission indicates that a transmission direction in a symbol in data transmission is DL, while dynamic scheduling signaling

configured transmission indicates that a transmission direction in a symbol in dynamic data transmission is UL, the terminal uses a symbol as a DL symbol and receives DL data.

If cell-specific RRC signaling configured transmission indicates that a transmission direction in a symbol in data transmission is UL, while dynamic scheduling signaling
5 configured transmission indicates that a transmission direction in a symbol in dynamic data transmission is DL, the terminal uses a symbol as a UL symbol and transmits UL data.

Application example 3:

Cell-specific RRC signaling configured transmission and UE-specific RRC signaling configured transmission. Specifically, a base station indicates a data transmission direction
10 by using cell-specific RRC signaling configured transmission. The base station may also configure data transmission by means of UE-specific RRC signaling. For example, measurement signal transmission is configured by the UE-specific RRC signaling, and the measurement signal transmission corresponds to a fixed transmission direction. For example, a symbol of periodic CSI-RS transmission configured by UE-specific RRC
15 signaling is a DL symbol, and a symbol of periodic CSI-RS transmission configured by UE-specific RRC signaling is a UL symbol.

If cell-specific RRC signaling configured transmission indicates that a transmission direction in a symbol in data transmission is DL, while UE-specific RRC signaling configured transmission indicates that a transmission direction in a symbol in data
20 transmission is UL, the terminal uses a symbol as a DL symbol and receives DL data.

If cell-specific RRC signaling configured transmission indicates that a transmission direction in a symbol in data transmission is UL, while UE-specific RRC signaling configured transmission indicates that a transmission direction in a symbol in data transmission is DL, the terminal uses a symbol as a UL symbol and transmits UL data.

25 FIG. 3 is a schematic structural diagram 1 of a transmission direction determining apparatus according to an embodiment of this application. As shown in FIG. 3, the apparatus includes:

a first receiving unit 301, configured to receive first configuration signaling;

a first determining unit 302, configured to determine, based on the first configuration signaling, that a target resource corresponds to a first transmission direction, where the first configuration signaling is cell-specific RRC signaling;

a second receiving unit 303, configured to receive second configuration signaling;

5 a second determining unit 304, configured to determine, based on the second configuration signaling, that the target resource corresponds to a second transmission direction;

a third determining unit 305, configured to determine a direction of the target resource as the first transmission direction; and

10 a transmission unit 306, configured to perform data transmission with a network device based on the first transmission direction.

In an implementation, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

15 In an implementation, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In an implementation, the dynamic scheduling signaling is DCI and/or a MAC CE.

In an implementation, the first determining unit 302 is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction;

20 the second determining unit 304 is configured to determine, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a DL transmission direction and/or a flexible transmission direction;

the third determining unit 305 is configured to determine the direction of the target resource as a UL transmission direction; and

25 the transmission unit 306 is configured to send UL data on the target resource.

In an implementation, the first determining unit 302 is configured to determine, based

on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction;

the second determining unit 304 is configured to determine, based on the semi-static UL/DL configuration signaling, that the target resource corresponds to a UL transmission
5 direction and/or a flexible transmission direction;

the third determining unit 305 is configured to determine a direction of the target resource as a DL transmission direction; and

the transmission unit 306 is configured to receive DL data on the target resource.

In an implementation, the first determining unit 302 is configured to determine, based
10 on the cell-specific RRC signaling, that the target resource corresponds to a UL transmission direction;

the second determining unit 304 is configured to determine, based on the dynamic scheduling signaling, that the target resource corresponds to a DL transmission direction;

the third determining unit 305 is configured to determine the direction of the target
15 resource as a UL transmission direction; and

the transmission unit 306 is configured to send UL data on the target resource.

In an implementation, the first determining unit 302 is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction;

20 the second determining unit 304 is configured to determine, based on the dynamic scheduling signaling, that the target resource corresponds to a UL transmission direction;

the third determining unit 305 is configured to determine a direction of the target resource as a DL transmission direction; and

the transmission unit 306 is configured to receive DL data on the target resource.

25 In an implementation, the first determining unit 302 is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a UL

transmission direction;

the second determining unit 304 is configured to determine, based on the UE-specific RRC signaling, that the target resource corresponds to a DL transmission direction;

the third determining unit 305 is configured to determine the direction of the target
5 resource as a UL transmission direction; and

the transmission unit 306 is configured to send UL data on the target resource.

In an implementation, the first determining unit 302 is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a DL transmission direction;

10 the second determining unit 304 is configured to determine, based on the UE-specific RRC signaling, that the target resource corresponds to a UL transmission direction;

the third determining unit 305 is configured to determine a direction of the target resource as a DL transmission direction; and

the transmission unit 306 is configured to receive DL data on the target resource.

15 In the foregoing solution, the target resource includes one or more symbols.

A person skilled in the art should understand that for the implementation functions of the units in the transmission direction determining apparatus shown in FIG. 3, refer to the related description of the foregoing transmission direction determining method. The functions of the units in the transmission direction determining apparatus shown in FIG. 3
20 may be implemented by a program running on a processor or may be implemented by a specific logic circuit.

FIG. 4 is a schematic structural diagram 2 of a transmission direction determining apparatus according to an embodiment of this application. As shown in FIG. 4, the apparatus includes:

25 a first configuration unit 401, configured to configure and send first configuration signaling, where the first configuration signaling is used to indicate that a target resource corresponds to a first transmission direction, and the first configuration signaling is

cell-specific RRC signaling;

a second configuration unit 402, configured to configure and send second configuration signaling, where the second configuration signaling is used to indicate that the target resource corresponds to a second transmission direction; and

- 5 a transmission unit 403, configured to perform data transmission with a terminal based on the first transmission direction.

In an implementation, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

- 10 In an implementation, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In an implementation, the dynamic scheduling signaling is DCI and/or a MAC CE.

In an implementation, if the second configuration signaling is the semi-static UL/DL configuration signaling, the second configuration unit 402 is configured to configure the second configuration signaling based on the first configuration signaling.

- 15 If data configured by the first configuration signaling is UL data, a transmission direction is configured as a UL transmission direction or a flexible transmission direction on a target resource, corresponding to the UL data, in the second configuration signaling, or if the data configured by the first configuration signaling is DL data, a transmission direction is configured as a DL transmission direction or a flexible transmission direction
- 20 on a target resource, corresponding to the DL data, in the second configuration signaling.

In an implementation, the target resource includes one or more symbols.

- 25 A person skilled in the art should understand that for the implementation functions of the units in the transmission direction determining apparatus shown in FIG. 4, refer to the related description of the foregoing transmission direction determining method. The functions of the units in the transmission direction determining apparatus shown in FIG. 4 may be implemented by a program running on a processor or may be implemented by a specific logic circuit.

FIG. 5 is a schematic flowchart 1 of a transmission channel determining method according to an embodiment of this application. As shown in FIG. 5, the transmission channel determining method includes the following steps.

Step 501: A terminal receives first configuration signaling, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling.

Herein, the terminal may be a device capable of accessing a communication network, for example, a mobile phone, a tablet computer or a notebook computer.

In this embodiment of this application, the first configuration signaling is cell-specific RRC signaling, and the cell-specific RRC signaling is used to configure the target resource for transmitting the first channel. Herein, the first channel can be a UL channel or a DL channel.

In an implementation, the first channel is a DL channel, a transmission direction corresponds to the first channel is a DL direction, and the terminal receives the first channel on the target resource. In another implementation, the first channel is a UL channel, the transmission direction corresponds to the first channel is a UL direction, and the terminal sends the first channel on the target resource.

In this embodiment of this application, the target resource is at least one time domain symbol that is configured for the first channel by the cell-specific RRC signaling.

Step 502: The terminal receives second configuration signaling, where the second configuration signaling is used to determine to transmit a second channel on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel.

In this embodiment of this application, the second configuration signaling may be semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In the foregoing solution, the semi-static UL/DL configuration signaling is RRC signaling or SI. Further, the semi-static UL/DL configuration signaling may be common

semi-static UL/DL configuration signaling or dedicated semi-static UL/DL configuration signaling.

In the foregoing solution, the dynamic scheduling signaling is DCI and/or a MAC CE.

In an implementation, the second channel is a DL channel, a transmission direction
 5 corresponding to the second channel is a DL direction, and the terminal receives the second
 channel on the target resource. In another implementation, the second channel is a UL
 channel, a transmission direction corresponding to the second channel is a UL direction,
 and the terminal sends the second channel on the target resource.

Step 503: The terminal transmits the first channel on the target resource.

10 Specifically, the terminal receives the first channel on the target resource if the
 transmission direction corresponding to the first channel is a DL direction; or the terminal
 sends the first channel on the target resource if the transmission direction corresponding to
 the first channel is a UL direction.

The technical solutions of this embodiment of this application are respectively
 15 described below with reference to different implementations of the second configuration
 signaling.

1) It is determined, based on the cell-specific RRC signaling, that the target resource is
 used to transmit a UL channel, and it is determined, **based on** the semi-static UL/DL
 configuration signaling, that the target resource is used to transmit a DL channel. In this
 20 case, the terminal transmits a UL channel on the target resource.

2) It is determined, based on the cell-specific RRC signaling, that the target resource is
 used to transmit a DL channel, and it is determined, based on the semi-static UL/DL
 configuration signaling, that the target resource is used to transmit a UL channel. In this
 case, the terminal transmits a DL channel on the target resource.

25 3) It is determined, based on the cell-specific RRC signaling, that the target resource is
 used to transmit a UL channel, and it is determined, based on the dynamic scheduling
 signaling, that the target resource is used to transmit a DL channel. In this case, the terminal
 transmits a UL channel on the target resource.

4) It is determined, based on the cell-specific RRC signaling, that the target resource is used to transmit a DL channel, and it is determined, based on the dynamic scheduling signaling, that the target resource is used to transmit a UL channel. The terminal transmits a DL channel on the target resource.

5) It is determined, based on the cell-specific RRC signaling, that the target resource is used to transmit a UL channel, and it is determined, based on the UE-specific RRC signaling, that the target resource is used to transmit a DL channel. In this case, the terminal transmits a UL channel on the target resource.

6) It is determined, based on the cell-specific RRC signaling, that the target resource is used to transmit a DL channel, and it is determined, based on the UE-specific RRC signaling, that the target resource is used to transmit a UL channel. The terminal transmits a DL channel on the target resource.

FIG. 6 is a schematic flowchart 2 of a transmission channel determining method according to an embodiment of this application. As shown in FIG. 6, the transmission channel determining method includes the following steps.

Step 601: A network device sends first configuration signaling to a terminal, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling.

In this embodiment of this application, the transmitting the first channel on the target resource includes:

sending, by the network device, the first channel on the target resource if a transmission direction corresponding to the first channel is a DL direction; or

receiving, by the network device, the first channel on the target resource if a transmission direction corresponding to the first channel is a UL direction.

Step 602: The network device sends second configuration signaling to the terminal, where the second configuration signaling is used to determine to transmit a second channel on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel.

In this embodiment of this application, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In the foregoing solution, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In the foregoing solution, the dynamic scheduling signaling is DCI and/or a MAC CE.

In this embodiment of this application, the transmitting the second channel on the target resource includes:

sending, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

receiving, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

Step 603: The network device transmits the first channel on the target resource.

In this embodiment of this application, the network device sends the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or the network device receives the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

In this embodiment of this application, the target resource includes one or more time domain symbols.

FIG. 7 is a schematic structural diagram 1 of a transmission channel determining apparatus according to an embodiment of this application. As shown in FIG. 7, the apparatus includes:

a first determining unit 701, configured to receive first configuration signaling, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling;

a second determining unit 702, configured to receive second configuration signaling, where the second configuration signaling is used to determine to transmit a second channel

on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel; and

a transmission unit 703, configured to transmit the first channel on the target resource.

In an implementation, the second configuration signaling is semi-static UL/DL
5 configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In an implementation, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In an implementation, the dynamic scheduling signaling is DCI and/or a MAC CE.

In an implementation, the transmitting the first channel on the target resource includes:
10 receiving, by a terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

sending, by a terminal, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

In an implementation, the transmitting the second channel on the target resource
15 includes:

receiving, by the terminal, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

sending, by the terminal, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

20 In an implementation, the transmission unit 703 receives the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

the transmission unit 703 sends the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

25 In an implementation, the target resource includes one or more time domain symbols.

A person skilled in the art should understand that for the implementation functions of

the units in the transmission channel determining apparatus shown in FIG. 7, refer to the related description of the foregoing transmission channel determining method. The functions of the units in the transmission channel determining apparatus shown in FIG. 7 may be implemented by a program running on a processor or may be implemented by a specific logic circuit.

FIG. 8 is a schematic structural diagram 2 of a transmission channel determining apparatus according to an embodiment of this application. As shown in FIG. 8, the apparatus includes:

a first sending unit 801, configured to send first configuration signaling to a terminal, where the first configuration signaling is used to determine to transmit a first channel on a target resource, and the first configuration signaling is cell-specific RRC signaling;

a second sending unit 802, configured to send second configuration signaling to the terminal, where the second configuration signaling is used to determine to transmit a second channel on the target resource, and a transmission direction corresponding to the first channel is different from a transmission direction corresponding to the second channel; and

a transmission unit 803, configured to transmit the first channel on the target resource.

In an implementation, the second configuration signaling is semi-static UL/DL configuration signaling, dynamic scheduling signaling or UE-specific RRC signaling.

In an implementation, the semi-static UL/DL configuration signaling is RRC signaling or SI.

In an implementation, the dynamic scheduling signaling is DCI and/or a MAC CE.

In an implementation, the transmitting the first channel on the target resource includes:

sending, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

receiving, by the network device, the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

In an implementation, the transmitting the second channel on the target resource includes:

sending, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a DL direction; or

- 5 receiving, by the network device, the second channel on the target resource if the transmission direction corresponding to the second channel is a UL direction.

In an implementation, the transmission unit 803 sends the first channel on the target resource if the transmission direction corresponding to the first channel is a DL direction; or

- 10 the transmission unit 803 receives the first channel on the target resource if the transmission direction corresponding to the first channel is a UL direction.

In an implementation, the target resource includes one or more time domain symbols.

- A person skilled in the art should understand that for the implementation functions of the units in the transmission channel determining apparatus shown in FIG. 8, refer to the
15 related description of the foregoing transmission channel determining method. The functions of the units in the transmission channel determining apparatus shown in FIG. 8 may be implemented by a program running on a processor or may be implemented by a specific logic circuit.

- When implemented in the form of software functional modules and sold or used as
20 independent products, the foregoing transmission direction determining apparatus in the embodiments of this application may be alternatively stored in a computer-readable storage medium. Based on such an understanding, the technical solutions of this application essentially, or the part contributing to the prior art may be implemented in the form of a software product. The computer software product is stored in a storage medium, and
25 includes several instructions for instructing a computer device (which may be a personal computer, a server, a network device, and the like) to perform all or some of the methods described in the embodiments of this application. The foregoing storage medium includes: any medium that can store program code, such as a USB flash drive, a removable hard disk,

a read-only memory (ROM), a magnetic disk, or a compact disc. In this way, the embodiments of this application are not limited to any specific combination of hardware and software.

Correspondingly, an embodiment of this application further provides a computer storage medium, storing a computer executable instruction thereon, where the computer executable instruction is executed by a processor to implement the foregoing transmission direction determining method according to the embodiments of this application.

FIG. 9 is a schematic structural diagram of a computer device according to an embodiment of this application. The computer device may be a terminal or a network device. As shown in FIG. 9, the computer device 100 may include one or more (only one is shown the figure) processors 1002 (the processor 1002 may be, but is not limited to, a processing apparatus such as a microcontroller unit (MCU) or a programmable logic device (a field-programmable gate array (FPGA))), a memory 1004 configured to store data, and a transmission apparatus 1006 configured to implement a communication function. A person of ordinary skill in the art may understand that the structure shown in FIG. 9 is only for the purpose of illustration, and does not constitute a limitation to the structure of the foregoing electronic apparatus. For example, the computer device 100 may include more or fewer components than those shown in FIG. 9, or have a configuration different from that shown in FIG. 9.

The memory 1004 may be configured to store a software program and module of application software, such as a program instruction/module corresponding to the paging time determining method in the embodiments of this application. The processor 1002 runs the software program and module stored in memory 1004, to execute various functional applications and data processing, that is, implement the foregoing method. The memory 1004 may include a high-speed random access memory, and may also include a nonvolatile memory, for example, one or more magnetic storage devices, flash memories or other nonvolatile solid-state memories. In some examples, the memory 1004 may further include memories remotely disposed relative to the processor 1002, and these remote memories may be connected to the computer device 100 through a network. Examples of the network

include, but are not limited to, the internet, an intranet, a local area network, a mobile communications network, and a combination thereof.

The transmission apparatus 1006 is configured to receive or send data through a network. A specific example of the foregoing network may include a wireless network
5 provided by a communication provider of the computer device 100. In an example, the transmission apparatus 1006 includes a network interface controller (NIC), which may be connected to another network device through a base station to communicate with the internet. In an example, the transmission apparatus 1006 may be a radio frequency (RF) module that is configured to communicate with the internet wirelessly.

10 The technical solutions of the embodiments of this application may be arbitrarily combined with each other as long as there is no contradiction.

In the several embodiments provided in this application, it should be understood that the disclosed methods and intelligent devices may be implemented in other manners. The described device embodiments are merely examples. For example, the unit division is
15 merely logical function division and may be other division in actual implementation. For example, a plurality of units or components may be combined or integrated into another system, or some features may be omitted or not performed. In addition, the displayed or discussed mutual couplings or direct couplings or communication connections between the components may be implemented through some interfaces, indirect couplings or
20 communication connections between the devices or units, or electrical connections, mechanical connections or connections in other forms.

The units described as separation parts may be or may not be physically separated. The part used as a display unit may be or may not be a physical unit. That is, the units may be located in the same place, or may be distributed to many network units. Some or all of the
25 units need to be selected according to actual requirements to achieve the purpose of the solutions of the embodiments.

In addition, functional units in the embodiments of this application may be integrated into a second processing unit, or each of the units may serve as a unit alone, or two or more

units may be integrated into one unit. The integrated unit may be implemented in the form of hardware, or may be implemented in the form of combining hardware and a software functional unit.

5 The descriptions are only specific implementations of this application, but are not intended to limit the protection scope of this application. Any variation or replacement readily figured out by a person skilled in the art within the technical scope disclosed in this application shall fall within the protection scope of this application.

CLAIMS

What is claimed is:

1. A method for determining a transmission direction, comprising:
obtaining, by a terminal, first configuration signaling, wherein the first
5 configuration signaling is used to determine a first transmission direction corresponding to
a target resource;
obtaining, by the terminal, second configuration signaling, wherein the second
configuration signaling is used to determine a second transmission direction corresponding
to the target resource; and
10 determining, by the terminal, a transmission direction of the target resource as the
first transmission direction, and transmitting data in the first transmission direction;
wherein the first configuration signaling is cell-specific radio resource control (RRC)
signaling.
2. The method according to claim 1, wherein the second configuration signaling is
15 semi-static uplink (UL)/downlink (DL) configuration signaling, downlink control
information (DCI) signaling, or user equipment (UE)-specific RRC signaling.
3. The method according to claim 1 or 2, wherein the determining a first transmission
direction corresponding to a target resource comprises:
determining, based on the cell-specific RRC signaling, that the target resource
20 corresponds to a uplink (UL) transmission direction; and
the determining a second transmission direction corresponding to the target resource
comprises:
determining, based on dynamic scheduling signaling, that the target resource
corresponds to a downlink (DL) transmission direction.
- 25 4. The method according to claim 1 or 2, wherein the determining a first transmission
direction corresponding to a target resource comprises:

determining, based on the cell-specific RRC signaling, that the target resource corresponds to a downlink (DL) transmission direction; and

the determining a second transmission direction corresponding to the target resource comprises:

- 5 determining, based on dynamic scheduling signaling, that the target resource corresponds to an uplink (UL) transmission direction.

5. The method according to claim 1 or 2, wherein the determining a first transmission direction corresponding to a target resource comprises:

- 10 determining, based on the cell-specific RRC signaling, that the target resource corresponds to an uplink (UL) transmission direction; and

the determining a second transmission direction corresponding to the target resource comprises:

determining, based on UE-specific RRC signaling, that the target resource corresponds to a downlink (DL) transmission direction.

- 15 6. The method according to claim 1 or 2, wherein the determining a first transmission direction corresponding to a target resource comprises:

determining, based on the cell-specific RRC signaling, that the target resource corresponds to a downlink (DL) transmission direction; and

- 20 the determining a second transmission direction corresponding to the target resource comprises:

determining, based on UE-specific RRC signaling, that the target resource corresponds to an uplink (UL) transmission direction.

- 25 7. The method according to claim 3 or 5, wherein the determining, by the terminal, a transmission direction of the target resource as the first transmission direction, and transmitting data in the first transmission direction comprises:

determining, by the terminal, the transmission direction of the target resource as a UL transmission direction, and sending UL data on the target resource.

8. The method according to claim 4 or 6, wherein the determining, by the terminal, a transmission direction of the target resource as the first transmission direction, and transmitting data in the first transmission direction comprises:

determining, by the terminal, the transmission direction of the target resource as a DL
5 transmission direction, and receiving DL data on the target resource.

9. The method according to any one of claims 1 to 8, wherein the target resource comprises one or more symbols.

10. A transmission direction determining method, comprising:

configuring and sending, by a network device, first configuration signaling, wherein
10 the first configuration signaling is used to determine a first transmission direction corresponding to a target resource, and the first configuration signaling is cell-specific radio resource control (RRC) signaling;

configuring and sending, by the network device, second configuration signaling,
wherein the second configuration signaling is used to determine a second transmission
15 direction corresponding to the target resource; and

performing, by the network device, data transmission in the first transmission direction.

11. The method according to claim 10, wherein the second configuration signaling is semi-static uplink (UL)/downlink (DL) configuration signaling, downlink control
20 information (DCI) signaling, or user equipment (UE)-specific RRC signaling.

12. The method according to claim 10 or 11, wherein the target resource comprises one or more symbols.

13. An apparatus for determining a transmission direction, comprising:

a first receiving unit, configured to obtain first configuration signaling;

25 a first determining unit, configured to determine, based on the first configuration signaling, a first transmission direction corresponding to a target resource, wherein the first configuration signaling is cell-specific radio resource control (RRC) signaling;

a second receiving unit, configured to obtain second configuration signaling;

a second determining unit, configured to determine, based on the second configuration signaling, a second transmission direction corresponding to the target resource;

5 a third determining unit, configured to determine a transmission direction of the target resource as the first transmission direction; and

a transmission unit, configured to transmit data in the first transmission direction.

14. The apparatus according to claim 13, wherein the second configuration signaling is semi-static uplink (UL)/downlink (DL) configuration signaling, downlink control information (DCI) signaling, or user equipment (UE)-specific RRC signaling.

10 15. The apparatus according to claim 13 or 14, wherein the first determining unit is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a uplink (UL) transmission direction; and

the second determining unit is configured to determine, based on dynamic scheduling signaling, that the target resource corresponds to a downlink (DL) transmission direction.

15 16. The apparatus according to claim 13 or 14, wherein the first determining unit is configured to determine, based on the cell-specific RRC signaling, that the target resource corresponds to a downlink (DL) transmission direction; and

the second determining unit is configured to determine, based on dynamic scheduling signaling, that the target resource corresponds to a uplink (UL) transmission direction.

20 17. The apparatus according to claim 15, wherein the third determining unit is configured to determine the transmission direction of the target resource as a UL transmission direction; and

the transmission unit is configured to send UL data on the target resource.

25 18. The apparatus according to claim 16, wherein the third determining unit is configured to determine the transmission direction of the target resource as a DL transmission direction; and

the transmission unit is configured to receive DL data on the target resource.

19. The apparatus according to any one of claims 13 to 18, wherein the target resource comprises one or more symbols.

20. A transmission direction determining apparatus, comprising:

5 a first configuration unit, configured to configure and send first configuration signaling, wherein the first configuration signaling is used to determine a first transmission direction corresponding to a target resource, and the first configuration signaling is cell-specific radio resource control (RRC) signaling;

10 a second configuration unit, configured to configure and send second configuration signaling, wherein the second configuration signaling is used to determine a second transmission direction corresponding to the target resource; and

 a transmission unit, configured to perform data transmission in the first transmission direction.

15 21. The apparatus according to claim 20, wherein the second configuration signaling is semi-static uplink (UL)/downlink (DL) configuration signaling, downlink control information (DCI) signaling, or user equipment (UE)-specific RRC signaling.

 22. The apparatus according to claim 20 or 21, wherein the target resource comprises one or more symbols.