

[0019] In combination with the first aspect or any optional implementation thereof, in another optional implementation thereof, the first numerology comprises at least one of:

subcarrier spacing;

number of subcarriers under a specific bandwidth;

5 number of subcarriers included in a Physical Resource Block (PRB);

length of an Orthogonal Frequency Division Multiplexing (OFDM) symbol;

number of points of Fast Fourier transform (FFT) or Inverse Fast Fourier transform (IFFT) used for generating an OFDM signal;

number of OFDM symbols included in a time unit;

10 number of time slots included in a time unit;

length of a signal prefix.

[0020] In a second aspect, there is provided a device for transmitting a signal, wherein the device for transmitting a signal may comprise units for performing a method in the first aspect or any optional implementation thereof.

15 **[0021]** In a third aspect, there is provided a device for transmitting a signal, wherein the device for transmitting a signal may include a memory and a processor, wherein the memory stores instructions, and the processor is configured to invoke instructions stored in the memory to perform a method in the first aspect or any optional implementation thereof.

[0022] In a fourth aspect, there is provided a computer-readable medium used for storing a program code to be executed by a terminal device, wherein the program code comprises instructions for performing methods in the first aspect or possible implementations thereof.

[0023] In a fifth aspect, there is provided a system-on-chip comprising an input interface, an output interface, a processor and a memory, wherein the processor is configured to execute a code in the memory and to implement methods in the first aspect or possible implementations thereof when the code is executed.

[0024] Therefore, in embodiments of the present application, a first device determines a first precoding granularity used to transmit a signal based on a first numerology used to transmit the signal. As such, a precoding granularity matched with a numerology can be obtained and both the precoding gain and the performance of channel estimation can be taken into account.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Accompanying drawings used to describe embodiments or the prior art will be introduced briefly below in order to illustrate the technical solutions of embodiments of the present application more clearly. Obviously, the accompanying drawings in the following description are merely for some embodiments of the present application, and other drawings

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relationship exists between associated objects.

[0042] FIG. 2 is a schematic flow chart of a method of transmitting a signal 200 according to an embodiment of the present application. The method 200 is optionally applicable to the system shown in FIG. 1, but is not limited thereto. As shown in Fig. 2, the method 200 includes the following.

[0043] At 210, a first device determines a first numerology used to transmit a signal between with a second device.

[0044] Optionally, the first device is a terminal device, and the second device is a network device; or, the first device is a network device, and the second device is a terminal device.

[0045] Optionally, the signal may be an uplink signal from the terminal device to the network device. For example, it may be a signal carried by a Physical Uplink Shared Channel (PUSCH) or a Physical Uplink Control Channel (PUCCH).

[0046] Optionally, the signal may be a downlink signal from the network device to the terminal device. For example, it may be a signal carried by a Physical Downlink Shared Channel (PDSCH) or a Physical Downlink Control Channel (PDCCH).

[0047] Optionally, in an embodiment of the present application, both the first device and the second device may also be terminal devices.

[0048] Optionally, in an embodiment of the present application, a numerology includes at least one resource parameter for determining a time-frequency resource for transmitting a signal.

[0049] Optionally, in an embodiment of the present application, the numerology includes at least one of the following:

subcarrier spacing, that is, a frequency interval of adjacent subcarriers, for example, 15 kHz or 60 kHz;

number of subcarriers under a specific bandwidth, for example, number of subcarriers corresponding to each possible system bandwidth;

number of subcarriers included in a Physical Resource Block (PRB), for example, which may be an integer multiple of 6, 12 or 16;

length of an Orthogonal Frequency Division Multiplexing (OFDM) symbol;

number of points of Fast Fourier transform (FFT) or Inverse Fast Fourier transform (IFFT) used for generating an OFDM signal, for example, which may be an integer power of 2;

number of OFDM symbols included in a time unit, for example, which may be an integer multiple of 1, 2, 3, 4, 7 or 14;

number of time slots included in a time unit, for example, the number of time slots included in the time span of 1 ms or 10 ms;

transmitted by the network device to the terminal device; or
the device 300 for transmitting a signal is a network device, and the third correspondence is a
preset correspondence on the network device, or a correspondence determined by the network
device.

5 **[0094]** Optionally, the signal is one from the device 300 for transmitting a signal to the
second device;

the transmitting unit 320 is further configured to:

perform precoding processing on a signal carried by a resource corresponding to each of the
first precoding granularities by a same precoding matrix;

10 transmitting the signal after the precoding processing to the second device.

[0095] Optionally, the signal is one from the second device to the device 300 for transmitting
a signal;

the transmitting unit 320 is further configured to:

receive the signal transmitted by the second device assuming that a signal carried by a resource
15 corresponding to each of the first precoding granularities is pre-coded by a same precoding
matrix.

[0096] Optionally, the first numerology includes at least one of the following:

subcarrier spacing;

number of subcarriers under a specific bandwidth;

20 number of subcarriers included in a Physical Resource Block (PRB);

length of an Orthogonal Frequency Division Multiplexing (OFDM) symbol;

number of points of Fast Fourier transform (FFT) or Inverse Fast Fourier transform (IFFT)
used for generating an OFDM signal;

number of OFDM symbols included in a time unit;

25 number of time slots included in a time unit;

length of a signal prefix.

[0097] It should be understood that the device 300 for transmitting a signal may be
corresponding to the terminal device in the method 200 shown in FIG.2 and may implement
corresponding functions of the terminal device. For brevity, it will not be described again
30 herein.

[0098] FIG. 6 is a schematic block diagram of a device 400 for transmitting a signal
according to an embodiment of the present application. As shown in FIG. 6, the device 400
includes a processor 410 and a memory 420. The memory 420 may store a program code, and
the processor 410 may execute the program code stored in the memory 420.

35 **[0099]** Optionally, as shown in FIG. 6, the device 400 may include a transceiver 430, and the

CLAIMS:

1. A method of transmitting a signal, comprising:
determining, by a first device, a first numerology used to transmit a signal;
5 determining, by the first device, a first precoding granularity which is used to transmit the signal based on the first numerology;
performing, by the first device, transmission of the signal with a second device using the first precoding granularity.
- 10 2. The method of claim 1, wherein the first precoding granularity comprises a time-domain precoding granularity and/or a frequency-domain precoding granularity.
3. The method of claim 1 or 2, wherein determining, by the first device, a first precoding granularity which is used to transmit the signal based on the first numerology, comprises:
15 determining the first precoding granularity based on the first numerology and a first correspondence, wherein the first correspondence indicates an association between at least one numerology and at least one precoding granularity.
4. The method of claim 1 or 2, wherein determining, by the first device, a first precoding
20 granularity which is used to transmit the signal based on the first numerology, comprises:
determining the first precoding granularity based on a first bandwidth and the first numerology, wherein the first bandwidth is a system bandwidth or a bandwidth for transmitting the signal.
5. The method of claim 1 or 2, wherein determining, by the first device, a first precoding
25 granularity which is used to transmit the signal based on the first numerology, comprises:
determining the first precoding granularity based on a first frequency point and the first numerology, wherein the first frequency point is a frequency point for transmitting the signal.
6. The method of any one of claims 1 to 5, wherein the signal is transmitted from the first
30 device to the second device;
performing, by the first device, transmission of the signal with a second device using the first precoding granularity comprises:
performing, by the first device, precoding processing on a signal carried by a resource corresponding to the first precoding granularities by a same precoding matrix;

transmitting the signal after the precoding processing to the second device.

7. The method of any one of claims 1 to 5, wherein the signal is transmitted from the second device to the first device;

5 wherein performing, by the first device, transmission of the signal with a second device using the first precoding granularity comprises:

receiving, by the first device, the signal transmitted by the second device assuming that a signal carried by a resource corresponding to the first precoding granularities is pre-coded by a same precoding matrix.

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8. The method of any one of claims 1 to 5, wherein the first numerology comprises at least one of:

subcarrier spacing;

number of subcarriers under a specific bandwidth;

15 number of subcarriers included in a Physical Resource Block (PRB);

length of an Orthogonal Frequency Division Multiplexing (OFDM) symbol;

number of points of Fast Fourier transform (FFT) or Inverse Fast Fourier transform (IFFT) used for generating an OFDM signal;

number of OFDM symbols included in a time unit;

20 number of time slots included in a time unit;

length of a signal prefix.

9. A device for transmitting a signal, comprising a memory and a processor, wherein the memory stores instructions, and the processor is configured to invoke the instructions stored in the memory to perform processings of a first device in a method of transmitting a signal which comprises:

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determining a first numerology used to transmit a signal;

determining a first precoding granularity which is used to transmit the signal based on the first numerology;

30 performing transmission of the signal with a second device using the first precoding granularity.

10. The device of claim 9, wherein determining a first precoding granularity which is used to transmit the signal based on the first numerology comprises:

35 determining the first precoding granularity based on the first numerology and a first

correspondence, wherein the first correspondence indicates an association between at least one numerology and at least one precoding granularity.

5 11. The device of claim 9, wherein determining a first precoding granularity which is used to transmit the signal based on the first numerology comprises:
determining the first precoding granularity based on a first bandwidth and the first numerology, wherein the first bandwidth is a system bandwidth or a bandwidth for transmitting the signal.

10 12. The device of claim 9, wherein determining a first precoding granularity which is used to transmit the signal based on the first numerology comprises:
determining the first precoding granularity based on a first frequency point and the first numerology, wherein the first frequency point is a frequency point for transmitting the signal.

15 13. The device of claim 9, wherein the signal is transmitted from the first device to the second device;
performing transmission of the signal with a second device using the first precoding granularity comprises:
performing precoding processing on a signal carried by a resource corresponding to the first precoding granularities by a same precoding matrix;
20 transmitting the signal after the precoding processing to the second device.

14. The device of claim 9, wherein the signal is transmitted from the second device to the first device;
wherein performing transmission of the signal with a second device using the first precoding
25 granularity comprises:
receiving the signal transmitted by the second device assuming that a signal carried by a resource corresponding to the first precoding granularities is pre-coded by a same precoding matrix.

30 15. The device of claim 9, wherein the first precoding granularity comprises a time-domain precoding granularity and/or a frequency-domain precoding granularity.

16. The device of claim 9, wherein the first numerology comprises at least one of:
subcarrier spacing;
35 number of subcarriers under a specific bandwidth;

- number of subcarriers included in a Physical Resource Block (PRB);
- length of an Orthogonal Frequency Division Multiplexing (OFDM) symbol;
- number of points of Fast Fourier transform (FFT) or Inverse Fast Fourier transform (IFFT) used for generating an OFDM signal;
- 5 number of OFDM symbols included in a time unit;
- number of time slots included in a time unit;
- length of a signal prefix.