

FIG. 7 illustrates a functional unit composition block diagram of a receiver according to an implementation of the disclosure.

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DETAILED DESCRIPTION

Referring to FIG. 1, FIG. 1 illustrates a possible network architecture of an exemplary communication system according to an implementation of the disclosure. The exemplary communication system may be, for example, a global system for mobile communications (GSM), a code division multiple access (CDMA) system, a time division multiple access (TDMA) system, wideband code division multiple access (WCDMA) system, a frequency division multiple access (FDMA) system, an orthogonal frequency-division multiple access (OFDMA) system, a single carrier FDMA (SC-FDMA) system, a general packet radio service (GPRS) system, a long term evolution (LTE) system, a 5G NR system and other similar communication systems. The exemplary communication system specifically includes a network device and a terminal. When the terminal accesses a mobile communication network provided by the network device, the terminal forms a communication connection with the network device through a wireless link. Such a communication connection manner may be a single-connection manner or a dual-connection manner or a multi-connection manner. When the communication connection manner is the single-connection manner, the network device may be an LTE base station or an NR base station (also called a gNB). When the communication manner is the dual-connection manner (which may specifically be implemented by a carrier aggregation (CA) technology or implemented by multiple network devices), and when the terminal is connected with the multiple network devices, the multiple network devices include a master eNodeB (MeNB) and a secondary eNodeB (SeNB). Data is transmitted between eNodeBs through backhauls. The MeNB may be an LTE base station and the SeNB may be an LTE base station. Or, the MeNB may be an NR base station and the SeNB may be an LTE base station. Or, the MeNB may be an NR base station and the SeNB may be an NR base station.

In the implementations of the disclosure, terms "network" and "system" are often used interchangeably and their meanings may be understood by those skilled in the art. A terminal involved in the implementations of the disclosure may include

initial bits in the CBG.

In a possible example, the preset condition may include that the parameter of information amount of the first CBG is greater than the parameter of information amount of the second CBG.

5 In a possible example, the operation that the M CBGs are mapped to the at least one transmission unit for bearing and transmission may include that: an information amount of each of the M CBGs is determined, and a reference decoding delay of each CBG is determined based on an information amount of the CBG; a time-domain position of a physical resource for each CBG is determined based on the reference
10 decoding delay of each CBG and preset correspondences between reference decoding delays and time-domain positions of physical resources, the physical resource being a transmission resource configured to bear the CBG in the at least one transmission unit; and each CBG is born and transmitted on the physical resource corresponding to the CBG based on the time-domain position of the physical resource for each CBG.

15 Herein, the correspondences may be directly proportional correspondences. The directly proportional correspondences refer to that, if the reference decoding delay of a CBG is longer, the physical resource corresponding to the CBG is ahead of a physical resource corresponding to another CBG having a shorter reference decoding delay in time domain, which may also be understood as that the time-domain position of the
20 physical resource corresponding to the CBG is in the front of a time domain position of a physical resource corresponding to another CBG having a shorter reference decoding delay.

In a possible example, the number of the code blocks in the first CBG is greater than the number of the code blocks in the second CBG.

25 It can be seen that, in the example, for the CBGs including different numbers of code blocks, during resource mapping, the sender may preferably map the CBG including a larger number of code blocks to the physical resource of which the time-domain position is ahead. Therefore, the decoding delay of the CBG may be balanced out by the transmission delays of as many as possible subsequent CBGs, thereby
30 facilitating reduction of the whole data reception delay, improvement of the data transmission efficiency and improvement of the user experience.

In a possible example, the number of the code blocks in the first CBG is equal

physical resource 2 of the two transmission units, maps CBG1 to a physical resource 3 of the two transmission units and maps CBG4 to a physical resource 4 of the two transmission units. The physical resource 1 is ahead of the physical resource 2 in time domain, the physical resource 2 is ahead of the physical resource 3 in time domain, and the physical resource 3 is ahead of the physical resource 4 in time domain. The UE bears and transmits the CBG2, the CBG3, the CBG1 and the CBG4 respectively on the physical resource 1, the physical resource 2, the physical resource 3 and the physical resource 4. The gNB receives the CBG2, the CBG3, the CBG1 and the CBG4 respectively on the physical resource 1, the physical resource 2, the physical resource 3 and the physical resource 4, and decodes each of the 4 CBGs after the respective CBG is received.

Consistent with the implementation illustrated in FIG. 2, referring to FIG. 4, FIG. 4 illustrates a structure diagram of a sender according to an implementation of the disclosure. As illustrated in the FIG. 4, the sender includes a processor, a memory, a radio frequency chip and a program. The program is stored in the memory and is configured to be executed by the processor. The program includes instructions configured to execute the following operations.

Data to be transmitted is segmented into N code blocks, and the N code blocks are divided into at least M CBGs. Herein, a difference between the numbers of the code blocks in any two CBGs is less than or equal to a preset value. N and M are positive integers. N is greater than or equal to M, and M is greater than or equal to 2.

The M CBGs are mapped to at least one transmission unit for bearing and transmission. The M CBGs at least include a first CBG and a second CBG. The at least one transmission unit at least includes a first physical resource corresponding to the first CBG and a second physical resource corresponding to the second CBG. A parameter of information amount of the first CBG and a parameter of information amount of the second CBG satisfy a preset condition. The first physical resource is ahead of the second physical resource in time domain.

It can be seen that, in the implementation of the disclosure, the data to be transmitted in a communication system is divided into the M CBGs, and the M CBGs are mapped to M physical resources for bearing and transmission. The M physical resources at least include the first physical resource corresponding to the first CBG and the second physical resource corresponding to the second CBG. Since the

condition. The first physical resource is ahead of the second physical resource in time domain.

In a possible example, the parameter of information amount may include at least one of: the number of the code blocks in the CBG, a modulation and code level for the
5 code blocks in the CBG, a code rate of the code blocks in the CBG, or a number of initial bits in the CBG.

In a possible example, the preset condition may include that the parameter of information amount of the first CBG is greater than the parameter of information amount of the second CBG.

10 In a possible example, the number of the code blocks in the first CBG is greater than the number of the code blocks in the second CBG.

In a possible example, the number of the code blocks in the first CBG is equal to the number of the code blocks in the second CBG, and the modulation and code level for the code blocks in the first CBG is higher than the modulation and code level for
15 the code blocks in the second CBG.

In a possible example, the number of the code blocks in the first CBG is equal to the number of the code blocks in the second CBG, and the code rate of the code blocks in the first CBG is higher than the code rate of the code blocks in the second CBG.

20 In a possible example, the number of the code blocks in the first CBG is equal to the number of the code blocks in the second CBG, and a number of initial bits of the code blocks in the first CBG is greater than a number of initial bits of the code blocks in the second CBG.

In a possible example, the transmission unit represents a transmission resource
25 specified by the communication system. The physical resource further includes a frequency-domain resource or a code-domain resource.

Herein, the segmenting unit 601 may be a processor, and the transmission unit 602 may be a radio frequency chip and the like.

When the segmenting unit 601 is the processor and the transmission unit 602 is
30 a radio frequency chip, the device for implementing data mapping and transmission in the implementation of the disclosure may be the sender illustrated in FIG. 4.

Under the condition that the integrated unit is adopted, FIG. 7 illustrates a

CLAIMS

1. A method for implementing data mapping and transmission, comprising:
 - segmenting data to be transmitted into N code blocks, and dividing the N code blocks into M code block groups (CBGs), wherein a difference between numbers of code blocks in any two CBGs is less than or equal to a preset value, N and M are positive integers, N is greater than or equal to M, and M is greater than or equal to 2; and
 - mapping the M CBGs to at least one transmission unit for bearing and transmission,
 - wherein the M CBGs comprise a first CBG and a second CBG, and a value of a parameter of information amount of the first CBG and a value of a parameter of information amount of the second CBG satisfy a preset condition; and
 - wherein the at least one transmission unit comprises a first physical resource corresponding to the first CBG and a second physical resource corresponding to the second CBG, and the first physical resource is ahead of the second physical resource in time domain.
2. The method of claim 1, wherein the parameter of information amount comprises at least one of:
 - a number of code blocks in a CBG,
 - a modulation and code level for code blocks in a CBG,
 - a code rate of code blocks in a CBG, or
 - a number of initial bits in a CBG.
3. The method of claim 1 or 2, wherein the preset condition comprises: the value of the parameter of information amount of the first CBG is greater than the value of the parameter of information amount of the second CBG.
4. The method of any one of claims 1-3, wherein a number of code blocks in the first CBG is greater than a number of code blocks in the second CBG.
5. The method of any one of claims 1-3, wherein
 - a number of code blocks in the first CBG is equal to a number of code blocks in

the second CBG, and a modulation and code level for the code blocks in the first CBG is higher than a modulation and code level for the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a code rate of the code blocks in the first CBG is higher than a code rate of the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a number of initial bits of the code blocks in the first CBG is greater than a number of initial bits of the code blocks in the second CBG.

6. A method for implementing data mapping and transmission, comprising:

receiving M code block groups (CBGs) mapped to at least one transmission unit, wherein the M CBGs are obtained by dividing N code blocks, the N code blocks are obtained by segmenting data to be transmitted, a difference between numbers of code blocks in any two CBGs is less than or equal to a preset value, the M CBGs comprise a first CBG and a second CBG, a value of a parameter of information amount of the first CBG and a value of a parameter of information amount of the second CBG satisfy a preset condition, the at least one transmission unit comprises a first physical resource corresponding to the first CBG and a second physical resource corresponding to the second CBG, the first physical resource is ahead of the second physical resource in time domain, N and M are positive integers, N is greater than or equal to M, and M is greater than or equal to 2; and

decoding each of the M CBGs after the respective CBG is received.

7. The method of claim 6, wherein the parameter of information amount comprises at least one of:

a number of code blocks in a CBG,
a modulation and code level for code blocks in a CBG,
a code rate of code blocks in a CBG, or
a number of initial bits in a CBG.

8. The method of claim 6 or 7, wherein the preset condition comprises: the value of the parameter of information amount of the first CBG being greater than the value of the parameter of information amount of the second CBG.

9. The method of any one of claims 6-8, wherein a number of code blocks in the first CBG is greater than a number of code blocks in the second CBG.

10. The method of any one of claims 6-8, wherein

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a modulation and code level for the code blocks in the first CBG is higher than a modulation and code level for the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a code rate of the code blocks in the first CBG is higher than a code rate of the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a number of initial bits of the code blocks in the first CBG is greater than a number of initial bits of the code blocks in the second CBG.

11. A device for implementing data mapping and transmission, applied to a sender, comprising a segmenting unit and a transmitting unit, wherein

the segmenting unit is configured to segment data to be transmitted into N code blocks, and divide the N code blocks into M code block groups (CBGs), wherein a difference between numbers of code blocks in any two CBGs is less than or equal to a preset value, N and M are positive integers, N is greater than or equal to M, and M is greater than or equal to 2; and

the transmitting unit is configured to map the M CBGs to at least one transmission unit for bearing and transmission, wherein the M CBGs comprise a first CBG and a second CBG, a value of a parameter of information amount of the first CBG and a value of a parameter of information amount of the second CBG satisfy a preset condition, the at least one transmission unit comprises a first physical resource corresponding to the first CBG and a second physical resource corresponding to the second CBG, and the first physical resource is ahead of the second physical resource in time domain.

12. The device of claim 11, wherein the parameter of information amount comprises at least one of:

a number of code blocks in a CBG,
a modulation and code level for code blocks in a CBG,
a code rate of code blocks in a CBG, or
a number of initial bits in a CBG.

13. The device of claim 11 or 12, wherein the preset condition comprises: the value of the parameter of information amount of the first CBG is greater than the value of the parameter of information amount of the second CBG.

14. The device of any one of claims 11-13, wherein a number of code blocks in the first CBG is greater than a number of code blocks in the second CBG.

15. The device of any one of claims 11-13, wherein

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a modulation and code level for the code blocks in the first CBG is higher than a modulation and code level for the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a code rate of the code blocks in the first CBG is higher than a code rate of the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a number of initial bits of the code blocks in the first CBG is greater than a number of initial bits of the code blocks in the second CBG.

16. A device for implementing data mapping and transmission, applied to a receiver, comprising a receiving unit and a decoding unit, wherein

the receiving unit is configured to receive M code block groups (CBGs) mapped to at least one transmission unit, wherein the M CBGs is obtained by dividing N code blocks, the N code blocks is obtained by segmenting data to be transmitted, a difference between numbers of code blocks in any two CBGs is less than or equal to a preset value, the M CBGs comprise a first CBG and a second CBG, a value of a parameter of information amount of the first CBG and a value of a parameter of information amount of the second CBG satisfy a preset condition, the at least one transmission unit comprises a first physical resource corresponding to the first CBG and a second

physical resource corresponding to the second CBG, the first physical resource is ahead of the second physical resource in time domain, N and M are positive integers, N is greater than or equal to M , and M is greater than or equal to 2; and

the decoding unit is configured to decode each of the M CBGs after the respective CBG is received.

17. The device of claim 16, wherein the parameter of information amount comprises at least one of:

- a number of code blocks in a CBG,
- a modulation and code level for code blocks in a CBG,
- a code rate of code blocks in a CBG, or
- a number of initial bits in a CBG.

18. The device of claim 16 or 17, wherein the preset condition comprises: the value of the parameter of information amount of the first CBG being greater than the value of the parameter of information amount of the second CBG.

19. The device of any one of claims 16-18, wherein a number of code blocks in the first CBG is greater than a number of code blocks in the second CBG.

20. The device of any one of claims 16-18, wherein

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a modulation and code level for the code blocks in the first CBG is higher than a modulation and code level for the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a code rate of the code blocks in the first CBG is higher than a code rate of the code blocks in the second CBG; or,

a number of code blocks in the first CBG is equal to a number of code blocks in the second CBG, and a number of initial bits of the code blocks in the first CBG is greater than a number of initial bits of the code blocks in the second CBG.