

CLAIMS

1. A method for data transmission, comprising:

determining, by a first terminal device, a transmission manner of a packet data convergence protocol (PDCP) protocol data unit (PDU) to be sent, the transmission manner comprising a data duplication transmission manner or a single-link transmission manner; and

sending, by the first terminal device, the PDCP PDU to a second terminal device or a network device according to the transmission manner of the PDCP PDU.

2. The method of claim 1, wherein determining, by the first terminal device, the transmission manner of the PDCP PDU to be sent comprises:

determining, by the first terminal device, the transmission manner of the PDCP PDU according to channel quality information of at least one link;

wherein the channel quality information of the at least one link comprises a number of times of retransmission scheduling on the at least one link within a first time period, a number of times of continuous initial transmission scheduling on the at least one link within a second time period or a modulation and coding scheme (MCS) value of the at least one link; and

determining, by the first terminal device, the transmission manner of the PDCP PDU according to the channel quality information of the at least one link comprises:

determining, by the first terminal device, the transmission manner of the PDCP PDU according to the number of times of retransmission scheduling on the at least one link within the first time period, the number of times of continuous initial transmission scheduling on the at least one link within the second time period or the MCS value of the at least one link.

3. The method of claim 2, wherein determining, by the first terminal device, the transmission manner of the PDCP PDU according to the number of times of retransmission scheduling on the at least one link within the first time period comprises:

in condition that the number of times of retransmission scheduling on any of the at least one link is less than or equal to a first threshold, determining, by the first terminal device, the transmission manner of the PDCP PDU as the single-link transmission manner; or

in condition that the number of times of retransmission scheduling on each of the at least one link is greater than a first threshold, determining, by the first terminal device, the transmission manner of the PDCP PDU as the data duplication transmission manner;

5 wherein determining, by the first terminal device, the transmission manner of the PDCP PDU according to the number of times of continuous initial transmission scheduling on the at least one link within the second time period comprises:

 in condition that the number of times of continuous initial transmission scheduling on any of the at least one link is greater than or equal to a second threshold,
10 determining, by the first terminal device, the transmission manner of the PDCP PDU as the single-link transmission manner; or

 in condition that the number of times of continuous initial transmission scheduling on each of the at least one link is less than a second threshold, determining, by the first terminal device, the transmission manner of the PDCP PDU as the data
15 duplication transmission manner; and

 wherein determining, by the first terminal device, the transmission manner of the PDCP PDU according to the MCS value of the at least one link comprises:

 in condition that the MCS value of any of the at least one link is greater than or equal to a third threshold, determining, by the first terminal device, the transmission
20 manner of the PDCP PDU as the single-link transmission manner; or

 in condition that the MCS value of each of the at least one link is less than a third threshold, determining, by the first terminal device, the transmission manner of the PDCP PDU as the data duplication transmission manner.

25 4. The method of claim 1, further comprising:

 receiving, by the first terminal device, first indication information sent by the second terminal device or the network device, the first indication information being used for indicating the transmission manner of the PDCP PDU; and

 determining, by the first terminal device, the transmission manner of the PDCP
30 PDU comprises:

 determining, by the first terminal device, the transmission manner of the PDCP PDU according to the first indication information.

5. The method of claim 4, further comprising:

receiving, by the first terminal device, second indication information sent by the second terminal device or the network device, the second indication information being used for indicating a link for transmission of the PDCP PDU; and

5 determining, by the first terminal device, the link for transmission of the PDCP PDU according to the second indication information.

6. A method for data transmission, comprising:

10 determining, by a network device, a transmission manner of a packet data convergence protocol (PDCP) protocol data unit (PDU) of a first terminal device, the transmission manner comprising a data duplication transmission manner or a single-link transmission manner; and

15 sending, by the network device, first indication information to the first terminal device, the first indication information being used for indicating the transmission manner of the PDCP PDU.

7. The method of claim 6, wherein determining, by the network device, the transmission manner of the PDCP PDU of the first terminal device comprises:

20 determining, by the network device, the transmission manner of the PDCP PDU according to channel quality information of at least one link;

25 wherein the channel quality information of the at least one link comprises a number of times of retransmission scheduling on the at least one link within a first time period, a number of times of continuous initial transmission scheduling on the at least one link within a second time period or a modulation and coding scheme (MCS) value of the at least one link; and

determining, by the network device, the transmission manner of the PDCP PDU according to the channel quality information of the at least one link comprises:

30 determining, by the network device, the transmission manner of the PDCP PDU according to the number of times of retransmission scheduling on the at least one link within the first time period, the number of times of continuous initial transmission scheduling on the at least one link within the second time period or the MCS value of the at least one link.

8. The method of claim 7, wherein determining, by the network device, the transmission manner of the PDCP PDU according to the number of times of retransmission scheduling on the at least one link within the first time period comprises:

in condition that the number of times of retransmission scheduling on any of the at least one link is less than or equal to a first threshold, determining, by the network device, the transmission manner of the PDCP PDU as the single-link transmission manner; or

in condition that the number of times of retransmission scheduling on each of the at least one link is greater than a first threshold, determining, by the network device, the transmission manner of the PDCP PDU as the data duplication transmission manner;

wherein determining, by the network device, the transmission manner of the PDCP PDU according to the number of times of continuous initial transmission scheduling on the at least one link within the second time period comprises:

in condition that the number of times of continuous initial transmission scheduling on any of the at least one link is greater than or equal to a second threshold, determining, by the network device, the transmission manner of the PDCP PDU as the single-link transmission manner; or

in condition that the number of times of continuous initial transmission scheduling on each of the at least one link is less than a second threshold, determining, by the network device, the transmission manner of the PDCP PDU as the data duplication transmission manner; and

wherein determining, by the network device, the transmission manner of the PDCP PDU according to the MCS value of the at least one link comprises:

in condition that the MCS value of any of the at least one link is greater than or equal to a third threshold, determining, by the network device, the transmission manner of the PDCP PDU as the single-link transmission manner; or

in condition that the MCS value of each of the at least one link is less than a third threshold, determining, by the network device, the transmission manner of the PDCP PDU as the data duplication transmission manner.

9. The method of any one of claims 6 to 8, wherein in condition of multiple links, the method further comprises:

in condition that the transmission manner of the PDCP PDU is the single-link

transmission manner, determining, by the network device, a link with optimal channel quality in the multiple links as a link for transmission of the PDCP PDU; or

in condition that the transmission manner of the PDCP PDU is the data duplication transmission manner, determining, by the network device according to a descending order of priorities of channel quality of the multiple links, several links in the multiple links as links for transmission of the PDCP PDU; and

sending, by the network device, second indication information to the first terminal device, the second indication information being used for indicating the link for transmission of the PDCP PDU.

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10. A terminal device for data transmission, wherein the terminal device comprises a first terminal device and the first terminal device comprises:

a processing unit, adapted to determine a transmission manner of a packet data convergence protocol (PDCP) protocol data unit (PDU), the transmission manner comprising a data duplication transmission manner or a single-link transmission manner; and

a sending unit, adapted to send the PDCP PDU to a second terminal device or a network device according to the transmission manner of the PDCP PDU.

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11. The terminal device of claim 10, wherein the processing unit is adapted to:

determine the transmission manner of the PDCP PDU according to channel quality information of at least one link;

wherein the channel quality information of the at least one link comprises a number of times of retransmission scheduling on the at least one link within a first time period, a number of times of continuous initial transmission scheduling on the at least one link within a second time period or a modulation and coding scheme (MCS) value of the at least one link, and the processing unit is adapted to:

determine the transmission manner of the PDCP PDU according to the number of times of retransmission scheduling on the at least one link within the first time period, the number of times of continuous initial transmission scheduling on the at least one link within the second time period or the MCS value of the at least one link.

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12. The terminal device of claim 11, wherein the processing unit is adapted to:

determine, in condition that the number of times of retransmission scheduling on any of the at least one link is less than or equal to a first threshold, the transmission manner of the PDCP PDU as the single-link transmission manner; or

5 determine, in condition that the number of times of retransmission scheduling on each of the at least one link is greater than a first threshold, the transmission manner of the PDCP PDU as the data duplication transmission manner;

the processing unit is adapted to:

10 determine, in condition that the number of times of continuous initial transmission scheduling on any of the at least one link is greater than or equal to a second threshold, the transmission manner of the PDCP PDU as the single-link transmission manner; or

15 determine, in condition that the number of times of continuous initial transmission scheduling on each of the at least one link is less than a second threshold, the transmission manner of the PDCP PDU as the data duplication transmission manner; and

the processing unit is adapted to:

determine, in condition that the MCS value of any of the at least one link is greater than or equal to a third threshold, the transmission manner of the PDCP PDU as the single-link transmission manner; or

20 determine, in condition that the MCS value of each of the at least one link is less than a third threshold, the transmission manner of the PDCP PDU as the data duplication transmission manner.

13. The terminal device of claim 10, further comprising:

25 a receiving unit, adapted to receive first indication information sent by the second terminal device or the network device, the first indication information being used for indicating the transmission manner of the PDCP PDU; and

the processing unit is adapted to:

30 determine the transmission manner of the PDCP PDU according to the first indication information.

14. The terminal device of claim 13, wherein

the receiving unit is further adapted to:

receive second indication information sent by the second terminal device or the network device, the second indication information being used for indicating a link for transmission of the PDCP PDU; and

the processing unit is adapted to:

- 5 determine the link for transmission of the PDCP PDU according to the second indication information.

15. A network device for data transmission, comprising:

- 10 a processing unit, adapted to determine a transmission manner of a packet data convergence protocol (PDCP) protocol data unit (PDU) of a first terminal device, the transmission manner comprising a data duplication transmission manner or a single-link transmission manner; and

- 15 a sending unit, adapted to send first indication information to the first terminal device, the first indication information being used for indicating the transmission manner of the PDCP PDU.

16. The network device of claim 15, wherein the processing unit is adapted to:

 determine the transmission manner of the PDCP PDU according to channel quality information of at least one link;

- 20 wherein the channel quality information of the at least one link comprises a number of times of retransmission scheduling on the at least one link within a first time period, a number of times of continuous initial transmission scheduling on the at least one link within a second time period or a Modulation and Coding Scheme (MCS) value of the at least one link, and the processing unit is adapted to:

- 25 determine the transmission manner of the PDCP PDU according to the number of times of retransmission scheduling on the at least one link within the first time period, the number of times of continuous initial transmission scheduling on the at least one link within the second time period or the MCS value of the at least one link.

30 17. The network device of claim 16, wherein the processing unit is adapted to:

 determine, in condition that the number of times of retransmission scheduling on any of the at least one link is less than or equal to a first threshold, the transmission manner of the PDCP PDU as the single-link transmission manner; or

determine, in condition that the number of times of retransmission scheduling on each of the at least one link is greater than a first threshold, the transmission manner of the PDCP PDU as the data duplication transmission manner;

the processing unit is adapted to:

5 determine, in condition that the number of times of continuous initial transmission scheduling on any of the at least one link is greater than or equal to a second threshold, the transmission manner of the PDCP PDU as the single-link transmission manner; or

10 determine, in condition that the number of times of continuous initial transmission scheduling on each of the at least one link is less than a second threshold, the transmission manner of the PDCP PDU as the data duplication transmission manner; and

the processing unit is adapted to:

15 determine, in condition that the MCS value of any of the at least one link is greater than or equal to a third threshold, the transmission manner of the PDCP PDU as the single-link transmission manner; or

20 determine, in condition that the MCS value of each of the at least one link is less than a third threshold, the transmission manner of the PDCP PDU as the data duplication transmission manner.

18. The network device of any one of claims 15 to 17, wherein in condition of multiple links,

the processing unit is further adapted to:

25 determine, in condition that the transmission manner of the PDCP PDU is the single-link transmission manner, a link with optimal channel quality in the multiple links as a link for transmission of the PDCP PDU; or

30 determine, in condition that the transmission manner of the PDCP PDU is the data duplication transmission manner, several links in the multiple links as links for transmission of the PDCP PDU according to a descending order of priorities of channel quality of the multiple links; and

the sending unit is further adapted to:

send second indication information to the first terminal device, the second indication information being used for indicating the link for transmission of the PDCP

PDU.