

CLAIMS

What is claimed is:

1. A communication method, wherein the method is applied to a terminal device, and the method comprises:

5 sending feedback information of a first data packet of a first multicast service, downlink control information (DCI) for scheduling the first data packet is scrambled by group radio network temporary identifier (G-RNTI);

10 receiving a second information, the second information comprises a discontinuous reception (DRX) configuration information corresponding to a first unicast service, the DRX configuration information corresponding to a first unicast service comprises duration of a second downlink hybrid automatic repeat request round trip time timer, HARQ RTT, timer and duration of a second downlink DRX retransmission timer, a data packet of the unicast service is scrambled by cell radio network temporary identifier, C-RNTI;

15 starting the second HARQ RTT timer at a first moment after an end of sending the feedback information;

receiving based on the unicast service scheduling information by the C-RNTI.

2. The method according to claim 1, wherein the method further comprises:

20 after the second downlink HARQ RTT timer expires, starting the second downlink DRX retransmission timer; and during running of the second downlink DRX retransmission timer, monitoring a PDCCH by the C-RNTI, and receiving scheduling information.

3. The method according to claim 1 or 2, wherein the first moment is a 1th symbol after an end of sending the feedback information.

4. The method according to any one of claims 1 to 3, wherein the method further comprises:

25 obtaining a first indication information, the first indication information indicates that a network device supports retransmission of the multicast service in a unicast manner.

5. The method according to claim 4, wherein the first indication information is carried in one of the following: a system message, a radio resource control, RRC, message, a media access control control element, MAC CE, or DCI.

30 6. The method according to any one of claims 1 to 5, wherein the feedback information is an ACK or a NACK, where the ACK indicates that the data packet corresponding to the first multicast

service is successfully received, and the NACK indicates that the data packet corresponding to the first multicast service is unsuccessfully received.

7. The method according to any one of claims 1 to 6, wherein the second information comprises a DRX configuration information corresponding to a first multicast service, the DRX configuration information corresponding to a first multicast service comprises duration of a first downlink HARQ RTT timer and duration of a first downlink DRX retransmission timer.

8. The method according to claim 7, wherein the method further comprises:

starting the first downlink HARQ RTT timer, after the first downlink HARQ RTT timer expires, starting the first downlink DRX retransmission timer; and during running of the first downlink DRX retransmission timer, monitoring a PDCCH by the G-RNTI, and receiving scheduling information.

9. The method according to claim 8, wherein starting the first downlink HARQ RTT timer at a 1th symbol after an end of sending the feedback information.

10. The method according to any one of claims 1 to 7, wherein the scheduling information comprises at least one of the following:

scheduling information for retransmission of the first data packet of a first multicast service or scheduling information for transmission of a new data packet.

11. A communication apparatus, comprising:

a sending unit, configured to send feedback information of a first data packet of a first multicast service, DCI for scheduling the first data packet is scrambled by group radio network temporary identifier G-RNTI;

a receiving unit, configured to receive a second information, the second information comprises a DRX configuration information corresponding to a first unicast service, the DRX configuration information corresponding to a first unicast service comprises duration of a second downlink HARQ RTT timer and duration of a second downlink DRX retransmission timer, a data packet of the unicast service is scrambled by cell radio network temporary identifier C-RNTI;

a determining unit, configured to start the second downlink HARQ RTT timer at a first moment after an end of sending the feedback information;

the receiving unit further configured to receive based on the unicast service scheduling information by the C-RNTI.

12. The apparatus according to claim 11, wherein after the second downlink HARQ RTT

timer expires, the determining unit further configured to start the second downlink DRX retransmission timer; and during running of the second downlink DRX retransmission timer, the receiving unit further configured to monitor a PDCCH by the C-RNTI and receive scheduling information.

5 13. The apparatus according to claim 11 or 12, wherein the first moment is a 1th symbol after an end of sending the feedback information.

14. The apparatus according to any one of claims 11 to 13, wherein the receiving unit further configured to obtain a first indication information, the first indication information indicates that a network device supports retransmission of the multicast service in a unicast manner.

10 15. The apparatus according to claim 14, wherein the first indication information is carried in one of the following: a system message, a radio resource control RRC message, a media access control control element MAC CE, or downlink control information DCI.

16. The apparatus according to any one of claims 11 to 15, wherein the feedback information is an ACK or a NACK, where the ACK indicates that the data packet corresponding to the first
15 multicast service is successfully received, and the NACK indicates that the data packet corresponding to the first multicast service is unsuccessfully received.

17. The apparatus according to any one of claims 11 to 16, wherein the second information comprises a DRX configuration information corresponding to a first multicast service, the DRX configuration information corresponding to a first multicast service comprises duration of a first
20 downlink HARQ RTT timer and duration of a first downlink DRX retransmission timer.

18. The apparatus according to claim 17, wherein the determining unit further configured to start the first downlink HARQ RTT timer, after the first downlink HARQ RTT timer expires, he determining unit further configured to start the first downlink DRX retransmission timer; and during running of the first downlink DRX retransmission timer, the receiving unit further
25 configured to monitoring a PDCCH by the G-RNTI and receive scheduling information.

19. The apparatus according to claim 18, wherein starting the first downlink HARQ RTT timer at a 1th symbol after an end of sending the feedback information.

20. The apparatus according to any one of claims 11 to 19, wherein the scheduling information comprises at least one of the following:

30 scheduling information for retransmission of the first data packet of a first multicast service or scheduling information for transmission of a new data packet.

21. A communication method, wherein the method is applied to a network device, and the method comprises:

receiving feedback information of a first data packet of a first multicast service, DCI for scheduling the first data packet is scrambled by G-RNTI;

5 sending a second information, the second information comprises a DRX configuration information corresponding to a first unicast service, the DRX configuration information corresponding to a first unicast service comprises duration of a second downlink HARQ RTT, timer and duration of a second downlink DRX retransmission timer, a data packet of the unicast service is scrambled by C-RNTI;

10 sending based on the unicast service scheduling information by the C-RNTI.

22. The method according to claim 21, wherein the method further comprises:

sending a first indication information, the first indication information indicates that the network device supports retransmission of the multicast service in a unicast manner.

15 23. The method according to claims 21 or 22, wherein the first indication information is carried in one of the following: a system message, a RRC message, a MAC CE, or DCI.

24. The method according to any one of claims 21 to 23, wherein the feedback information is an ACK or a NACK, where the ACK indicates that the data packet corresponding to the first multicast service is successfully received, and the NACK indicates that the data packet corresponding to the first multicast service is unsuccessfully received.

20 25. The method according to any one of claims 21 to 24, wherein the second information comprises a DRX configuration information corresponding to a first multicast service, the DRX configuration information corresponding to a first multicast service comprises duration of a first downlink HARQ RTT timer and duration of a first downlink DRX retransmission timer.

25 26. The method according to any one of claims 21 to 27, wherein the scheduling information comprises at least one of the following:

scheduling information for retransmission of the first data packet of a first multicast service or scheduling information for transmission of a new data packet.

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27. A communication apparatus, comprising:

30 a receiving unit, configured to receive feedback information of a first data packet of a first multicast service, DCI for scheduling the first data packet is scrambled by G-RNTI;

a sending unit, configured to send a second information, the second information comprises a DRX configuration information corresponding to a first unicast service, the DRX configuration information corresponding to a first unicast service comprises duration of a second downlink HARQ RTT, timer and duration of a second downlink DRX retransmission timer, a data packet of the unicast service is scrambled by C-RNTI;

the sending unit, further configured to send based on the unicast service scheduling information by the C-RNTI.

28. The apparatus according to claim 27, wherein the method further comprises:

sending a first indication information, the first indication information indicates that the network device supports retransmission of the multicast service in a unicast manner.

29. The apparatus according to claims 27 or 28, wherein the first indication information is carried in one of the following: a system message, a RRC message, a MAC CE, or DCI.

30. The apparatus according to any one of claims 27 to 29, wherein the feedback information is an ACK or a NACK, where the ACK indicates that the data packet corresponding to the first multicast service is successfully received, and the NACK indicates that the data packet corresponding to the first multicast service is unsuccessfully received.

31. The apparatus according to any one of claims 27 to 30, wherein the second information comprises a DRX configuration information corresponding to a first multicast service, the DRX configuration information corresponding to a first multicast service comprises duration of a first downlink HARQ RTT timer and duration of a first downlink DRX retransmission timer.

32. The apparatus according to any one of claims 27 to 31, wherein the scheduling information comprises at least one of the following:

scheduling information for retransmission of the first data packet of a first multicast service or scheduling information for transmission of a new data packet.

33. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store a computer program, and when the computer program is run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 10 , or any one of claims 21 to 26.

~~sending feedback information to a network device, wherein the feedback information corresponds to a first multicast service;~~

~~determining discontinuous reception DRX configuration information, wherein the DRX~~

~~configuration information comprises at least one of discontinuous reception DRX configuration information corresponding to the first multicast service and DRX configuration information corresponding to a unicast service; and~~

~~receiving scheduling information from the network device based on the DRX configuration information.~~

~~2. The method according to claim 1, wherein the DRX configuration information corresponding to the first multicast service comprises duration of a first downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a first downlink DRX retransmission timer.~~

~~3. The method according to claim 2, wherein the DRX configuration information corresponding to the unicast service comprises duration of a second downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a second downlink DRX retransmission timer.~~

~~4. The method according to claim 3, wherein the DRX configuration information comprises the discontinuous reception DRX configuration information corresponding to the first multicast service and the DRX configuration information corresponding to the unicast service, and the receiving scheduling information from the network device based on the DRX configuration information comprises:~~

~~starting the first HARQ RTT timer; if the first HARQ RTT timer expires, starting the first downlink DRX retransmission timer; and during running of the first downlink DRX retransmission timer, monitoring a PDCCH by using a first radio network temporary identifier RNTI corresponding to the first multicast service, and receiving scheduling information from the network device; and~~

~~starting the second HARQ RTT timer; if the second HARQ RTT timer expires, starting the second downlink DRX retransmission timer; and during running of the second downlink DRX retransmission timer, monitoring a PDCCH by using a second RNTI corresponding to the unicast service, and receiving scheduling information from the network device.~~

~~5. The method according to claim 3, wherein the DRX configuration information comprises the discontinuous reception DRX configuration information corresponding to the first multicast service, and the receiving scheduling information from the network device based on the DRX configuration information comprises:~~

~~starting the first HARQ RTT timer; if the first HARQ RTT timer expires, starting the first downlink DRX retransmission timer; and during running of the first retransmission timer, monitoring a PDCCH by using a first RNTI and a second RNTI, and receiving the scheduling information from the network device.~~

5 ~~6. The method according to claim 3, wherein the DRX configuration information comprises the DRX configuration information corresponding to the unicast service, and the receiving scheduling information from the network device based on the DRX configuration information comprises:~~

10 ~~starting the second HARQ RTT timer; if the second HARQ RTT timer expires, starting the second downlink DRX retransmission timer; and during running of the second retransmission timer, monitoring a PDCCH by using a first RNTI and a second RNTI, and receiving the scheduling information from the network device.~~

~~7. The method according to any one of claims 4 to 6, wherein the starting the first HARQ RTT timer and/or starting the second HARQ RTT timer comprises:~~

15 ~~starting the first HARQ RTT timer at a first moment after sending the feedback information to the network device ends; and/or~~

~~starting the second HARQ RTT timer at a second moment after sending the feedback information to the network device ends.~~

~~8. The method according to claim 7, wherein the method further comprises:~~

20 ~~starting the first downlink DRX retransmission timer at a third moment after the first HARQ RTT timer expires; and/or~~

~~starting the first downlink DRX retransmission timer at a fourth moment after the second HARQ RTT timer expires.~~

25 ~~9. The method according to claim 8, wherein the first moment is an ath-symbol, the second moment is a bth-symbol, the third moment is a cth-symbol, and the fourth moment is a dth-symbol, wherein a, b, c, and d are positive integers greater than or equal to 1.~~

~~10. The method according to any one of claims 4 to 9, wherein the method further comprises:~~

~~starting the first HARQ RTT timer if the feedback information indicates that multicast service data is unsuccessfully received; or~~

30 ~~starting the second HARQ RTT timer if the feedback information indicates that multicast service data is unsuccessfully received.~~

11. The method according to any one of claims 1 to 10, wherein the method further comprises:
obtaining first indication information, wherein the first indication information indicates that
the network device supports retransmission of the multicast service in a unicast manner.

12. The method according to claim 11, wherein the first indication information is carried in
any one of the following: a system message, a radio resource control RRC message, a media access
control control element MAC CE, or downlink control information DCI.

13. The method according to any one of claims 1 to 12, wherein the determining
discontinuous reception DRX configuration information comprises:

receiving second indication information, wherein the second indication information indicates
the terminal device to use the DRX configuration information corresponding to the unicast service
and/or the DRX configuration information corresponding to the multicast service; and

determining the discontinuous reception DRX configuration information based on the second
indication information.

14. The method according to any one of claims 1 to 13, wherein the scheduling information
of the network device comprises scheduling information for retransmission of the first multicast
service and/or scheduling information for transmission of a new data packet, wherein

the new data packet comprises a data packet of a second multicast service or a data packet
corresponding to the unicast service.

15. A communication method, wherein the method is applied to a network device, and the
method comprises:

receiving feedback information sent by a terminal device, wherein the feedback information
corresponds to a first multicast service; and

sending scheduling information to the terminal device based on the feedback information.

16. The method according to claim 15, wherein the method further comprises:

sending first indication information, wherein the first indication information indicates that the
network device supports retransmission of the multicast service in a unicast manner.

17. The method according to claim 16, wherein the first indication information is carried in
any one of the following: a system message, a radio resource control RRC message, a media access
control control element MAC CE, or downlink control information DCI.

18. The method according to any one of claims 15 to 17, wherein the method further
comprises:

5 sending second indication information, wherein the second indication information indicates the terminal device to use DRX configuration information corresponding to a unicast service and/or DRX configuration information corresponding to the multicast service.

19. The method according to claim 18, wherein the DRX configuration information
5 corresponding to the first multicast service comprises duration of a first downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a first downlink DRX retransmission timer.

20. The method according to claim 18 or 19, wherein the DRX configuration information
10 corresponding to the unicast service comprises duration of a second downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a second downlink DRX retransmission timer.

21. The method according to any one of claims 15 to 20, wherein the scheduling information
comprises scheduling information for retransmission of the first multicast service and/or
scheduling information for transmission of a new data packet, wherein

15 the new data packet comprises a data packet of a second multicast service or a data packet corresponding to the unicast service.

22. A terminal device, wherein the device comprises:

a sending unit, configured to send feedback information to a network device, wherein the
feedback information corresponds to a first multicast service;

20 a determining unit, configured to determine discontinuous reception DRX configuration information, wherein the DRX configuration information comprises at least one of discontinuous reception DRX configuration information corresponding to the first multicast service and DRX configuration information corresponding to a unicast service; and

25 a receiving unit, configured to receive scheduling information from the network device based on the DRX configuration information.

23. The device according to claim 22, wherein the DRX configuration information
corresponding to the first multicast service comprises duration of a first downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a first downlink DRX retransmission timer.

30 24. The device according to claim 23, wherein the DRX configuration information corresponding to the unicast service comprises duration of a second downlink hybrid automatic

repeat request round trip time timer HARQ RTT timer and duration of a second downlink DRX retransmission timer.

25. The device according to claim 24, wherein the DRX configuration information comprises the discontinuous reception DRX configuration information corresponding to the first multicast service and the DRX configuration information corresponding to the unicast service, and the receiving unit is configured to:

start the first HARQ RTT timer; if the first HARQ RTT timer expires, start the first downlink DRX retransmission timer; and during running of the first downlink DRX retransmission timer, monitor a PDCCH by using a first radio network temporary identifier RNTI corresponding to the first multicast service, and receive scheduling information from the network device; and

start the second HARQ RTT timer; if the second HARQ RTT timer expires, start the second downlink DRX retransmission timer; and during running of the second downlink DRX retransmission timer, monitor a PDCCH by using a second RNTI corresponding to the unicast service, and receive scheduling information from the network device.

26. The device according to claim 24, wherein the DRX configuration information comprises the discontinuous reception DRX configuration information corresponding to the first multicast service, and the receiving unit is configured to:

start the first HARQ RTT timer; if the first HARQ RTT timer expires, start the first downlink DRX retransmission timer; and during running of the first retransmission timer, monitor a PDCCH by using a first RNTI and a second RNTI, and receive the scheduling information from the network device.

27. The device according to claim 24, wherein the DRX configuration information comprises the DRX configuration information corresponding to the unicast service, and the receiving unit is configured to:

start the second HARQ RTT timer; if the second HARQ RTT timer expires, start the second downlink DRX retransmission timer; and during running of the second retransmission timer, monitor a PDCCH by using a first RNTI and a second RNTI, and receive the scheduling information from the network device.

28. The device according to any one of claims 25 to 27, wherein in case of starting the first HARQ RTT timer and/or starting the second HARQ RTT timer, the receiving unit is specifically configured to:

~~start the first HARQ RTT timer at a first moment after sending the feedback information to the network device ends; and/or~~

~~start the second HARQ RTT timer at a second moment after sending the feedback information to the network device ends.~~

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

~~start the first downlink DRX retransmission timer at a third moment after the first HARQ RTT timer expires; and/or~~

~~start the first downlink DRX retransmission timer at a fourth moment after the second HARQ RTT timer expires.~~

10 ~~30. The device according to claim 29, wherein the first moment is an ath-symbol, the second moment is a bth-symbol, the third moment is a cth-symbol, and the fourth moment is a dth-symbol, wherein a, b, c, and d are positive integers greater than or equal to 1.~~

~~31. The device according to any one of claims 25 to 30, wherein the receiving unit is further configured to:~~

15 ~~start the first HARQ RTT timer if the feedback information indicates that multicast service data is unsuccessfully received; or~~

~~start the second HARQ RTT timer if the feedback information indicates that multicast service data is unsuccessfully received.~~

20 ~~32. The device according to any one of claims 22 to 31, wherein the device is further configured to:~~

~~obtain first indication information, wherein the first indication information indicates that the network device supports retransmission of the multicast service in a unicast manner.~~

25 ~~33. The device according to claim 32, wherein the first indication information is carried in any one of the following: a system message, a radio resource control RRC message, a media access control control element MAC CE, or downlink control information DCI.~~

~~34. The device according to any one of claims 21 to 33, wherein the determining unit is further configured to:~~

30 ~~receive second indication information, wherein the second indication information indicates the terminal device to use the DRX configuration information corresponding to the unicast service and/or the DRX configuration information corresponding to the multicast service; and~~

~~determine the discontinuous reception DRX configuration information based on the second~~

indication information.

35. The device according to any one of claims 21 to 34, wherein the scheduling information of the network device comprises scheduling information for retransmission of the first multicast service and/or scheduling information for transmission of a new data packet, wherein

5 the new data packet comprises a data packet of a second multicast service or a data packet corresponding to the unicast service.

36. A network device, wherein the device comprises:

a receiving unit, configured to receive feedback information sent by a terminal device, wherein the feedback information corresponds to a first multicast service; and

10 a sending unit, configured to send scheduling information to the terminal device based on the feedback information.

37. The device according to claim 36, wherein the device is configured to:

send first indication information, wherein the first indication information indicates that the network device supports retransmission of the multicast service in a unicast manner.

15 38. The device according to claim 37, wherein the first indication information is carried in any one of the following: a system message, a radio resource control RRC message, a media access control control element MAC CE, or downlink control information DCI.

39. The device according to any one of claims 36 to 38, wherein the device is further configured to:

20 send second indication information, wherein the second indication information indicates the terminal device to use DRX configuration information corresponding to a unicast service and/or DRX configuration information corresponding to the multicast service.

25 40. The device according to claim 39, wherein the DRX configuration information corresponding to the first multicast service comprises duration of a first downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a first downlink DRX retransmission timer.

30 41. The device according to claim 39 or 40, wherein the DRX configuration information corresponding to the unicast service comprises duration of a second downlink hybrid automatic repeat request round trip time timer HARQ RTT timer and duration of a second downlink DRX retransmission timer.

42. The device according to any one of claims 36 to 41, wherein the scheduling information

~~comprises scheduling information for retransmission of the first multicast service and/or scheduling information for transmission of a new data packet, wherein~~

~~the new data packet comprises a data packet of a second multicast service or a data packet corresponding to the unicast service.~~

5 ~~43. A terminal device, wherein the device comprises:~~

~~a memory, configured to store instructions; and~~

~~at least one processor, coupled to the memory, wherein~~

~~when the at least one processor executes the instructions, the instructions enable the processor to perform the method according to any one of claims 1 to 14.~~

10 ~~44. A network device, wherein the device comprises:~~

~~a memory, configured to store instructions; and~~

~~at least one processor, coupled to the memory, wherein~~

~~when the at least one processor executes the instructions, the instructions enable the processor to perform the method according to any one of claims 15 to 21.~~

15 ~~45. A computer storage medium, wherein the computer storage medium stores a computer program, and the computer program comprises program instructions; and when executing the program instructions, a processor performs the method according to any one of claims 1 to 21.~~