

CLAIMS

1. A communication method, comprising:

not sending first channel state information (CSI) and/or first sounding reference signal (SRS) at first time if a preset condition is met, wherein the preset condition comprises any one or more of the following:

a first condition, wherein the first condition comprises: the first time does not belong to active time of a first discontinuous reception (DRX), and a configuration message of a first bandwidth part (BWP) does not comprise information about a common frequency resource (CFR);

a second condition, wherein the second condition comprises: the first time does not belong to the active time of the first DRX, a configuration message of a second BWP comprises the information about the CFR, and the first time does not belong to active time of a second DRX set;

a fourth condition, wherein the fourth condition comprises: a first timer does not run at the first time, and the configuration message of the first BWP does not comprise the information about the CFR; and

a fifth condition, wherein the fifth condition comprises: the first timer does not run at the first time, the configuration message of the second BWP comprises the information about the CFR, and a second timer set does not run at the first time;

wherein

the first DRX is used to control monitoring of a terminal device specific control information;

the second DRX set comprises at least one multicast DRX, the at least one multicast DRX comprises a first multicast DRX, and the first multicast DRX is used to control monitoring of control information related to a third multicast service;

in running time of the first timer, monitoring the terminal device specific control information, wherein

the second timer set comprises at least one multicast timer, and the at least one multicast timer comprises a first multicast timer; and in running time of the first multicast timer, the terminal device monitors control information related to a seventh multicast service, wherein

the first BWP comprises all active BWPs of the terminal device; and

the second BWP comprises one or more active BWPs of the terminal device.

2. The communication method according to claim 1, wherein the first time is a symbol n.

3. The communication method according to claim 1 or 2, wherein the first DRX is a unicast

DRX, or a DRX group.

4. The communication method according to any one of claims 1 to 3, wherein the first timer is an on duration timer related to a unicast DRX, or an on duration timer related to one DRX group.

5 5. The communication method according to any one of claims 1 to 4, wherein the at least one multicast timer is an on duration timer corresponding to a multicast, or an on duration timer related to a multicast DRX.

6. The communication method according to any one of claims 1 to 5, wherein the second DRX set comprises DRXes corresponding to all multicasts that the terminal device joins.

10 7. The communication method according to any one of claims 1 to 6, wherein the preset condition comprises at least one of the first condition and the second condition, and the not sending first CSI at first time comprises:

not sending the first CSI at the first time for a first cell set, wherein

the first cell set comprises at least one cell, and the first cell set is associated with the first DRX.

15 8. The communication method according to claim 7, wherein the second DRX set comprises DRXes corresponding to all multicasts associated with the first cell set or the first DRX.

9. The communication method according to any one of claims 1 to 8, wherein the second timer set comprises multicast timers corresponding to all the multicasts that the terminal device joins.

20 10. The communication method according to any one of claims 1 to 9, wherein the preset condition comprises at least one of the fourth condition and the fifth condition, and the not sending first CSI at first time comprises:

not sending the first CSI at the first time for the first cell set.

11. The communication method according to claim 10, wherein the second timer set comprises multicast timers corresponding to all the multicasts associated with the first cell set or the first DRX.

25 12. The communication method according to any one of claims 1 to 11, wherein the preset condition comprises at least one of the second condition and the fifth condition, and the preset condition further comprises:

a multicast DRX is configured for a ninth multicast service set, and the ninth multicast service set comprises all multicast services that the terminal device joins.

30 13. The communication method according to any one of claims 1 to 12, wherein the preset condition comprises at least one of the second condition and the fifth condition, and the preset condition further comprises:

the multicast DRX is configured for the ninth multicast service set, and the ninth multicast service set comprises all the multicasts associated with the first cell set or the first DRX.

14. The communication method according to any one of claims 1 to 13, wherein the not sending

first CSI at first time comprises any one or more of the following:

- not sending CSI on the PUCCH;
- not sending the periodic CSI on the PUCCH;
- not sending the semi-persistent CSI on the PUCCH;
- 5 not sending the CSI on the PUSCH;
- not sending the semi-persistent CSI on the PUSCH;
- not sending, on the PUCCH, the CSI that is the L1-RSRP;
- not sending, on the PUCCH, the CSI that is not the L1-RSRP;
- not sending, on the PUCCH, the periodic CSI that is the L1-RSRP; and

10 not sending, on the PUCCH, the periodic CSI that is not the L1-RSRP.15. The communication method according to any one of claims 1 to 14, wherein the preset condition comprises at least one of the fourth condition, the fifth condition, and the sixth condition, and the method and/or the preset condition further comprise/comprises:

obtaining first information, wherein the first information indicates the terminal device to send
15 CSI in running time of a unicast timer and/or in running time of a multicast timer.

16. The communication method according to claim 3, wherein the first DRX is the unicast DRX, the not sending first channel state information CSI and/or SRS at first time if a preset condition is met comprises:

if a DCP is configured for the terminal device, the symbol n is in duration of the on duration
20 timer corresponding to the unicast, and the on duration timer corresponding to the unicast is not started or not restarted, if the symbol n is not in active time of the unicast DRX, and if the configuration message of all active BWPs does not include the information about the CFR,

perform any one or more of the following:

not sending the semi-persistent CSI configured on the PUSCH;

25 if the terminal device is not configured to report the periodic CSI or CSI that is the L1-RSRP, not sending, on the PUCCH, the periodic CSI that is the L1-RSRP; or

if the terminal device is not configured to report the periodic CSI or CSI that is not the L1-RSRP, not sending, on the PUCCH, the periodic CSI that is not the L1-RSRP.

17. The communication method according to claim 3, wherein the first DRX is the DRX group,
30 the not sending first channel state information CSI and/or SRS at first time if a preset condition is met comprises:

if DCP is not configured for the terminal device, or the symbol n is not in duration of the on duration timer corresponding to the unicast, or the on duration timer corresponding to the unicast is started or restarted, and

if the symbol n is not in active time of the DRX group, and the configuration message of all active BWPs associated with the DRX group does not include the information about the CFR, for the DRX group or in the DRX group,

not sending the semi-persistent CSI configured on the PUSCH, and/or not sending the CSI on the PUCCH.

18. The communication method according to claim 6, wherein the first DRX is the unicast DRX, the not sending first channel state information CSI and/or SRS comprises:

if a DCP is configured for the terminal device, the symbol n is in duration of the on duration timer corresponding to the unicast, and the on duration timer corresponding to the unicast is not started or not restarted, if the symbol n is not in active time of the unicast DRX, if the configuration message of one active BWP includes the information about the CFR, and if the symbol n is not in active time of all multicast DRXes, and a multicast DRX is configured for each multicast that UE joins, performs any one or more of the following:

not sending the semi-persistent CSI configured on the PUSCH;

if the terminal device is not configured to report the periodic CSI or CSI that is the L1-RSRP, not sending, on the PUCCH, the periodic CSI that is the L1-RSRP; or

if the terminal device is not configured to report the periodic CSI or CSI that is not the L1-RSRP, not sending, on the PUCCH, the periodic CSI that is not the L1-RSRP

19. The communication method according to claim 3, wherein the first DRX is the DRX group, the second DRX set comprises all multicast DRXes associated with the first DRX;

the not sending first channel state information CSI and/or SRS comprises:

if DCP is not configured for the terminal device, or the symbol n is not in duration of the on duration timer corresponding to the unicast, or the on duration timer corresponding to the unicast is started or restarted, if the symbol n is not in active time of one DRX group, if the configuration message of one active BWP associated with the DRX group includes the information about the CFR, and if the symbol n is not in active time of all multicast DRXes associated with the DRX group, and a multicast DRX is configured for each multicast that UE joins and that is associated with the DRX group, for the DRX group or in the DRX group,

not sending the semi-persistent CSI configured on the PUSCH, and/or

not sending the CSI on the PUCCH.

20. The communication method according to claim 4,

wherein the first timer is an on duration timer related to one DRX group,

the not sending first channel state information CSI and/or SRS comprises:

if DCP is not configured for the terminal device, or the symbol n is not in duration of the on

duration timer corresponding to the unicast, or the on duration timer corresponding to the unicast is started or restarted, if CSI masking is configured for the terminal device, if an on duration timer related to one DRX group does not run on the symbol n, and if a configuration message of all active BWPs associated with the DRX group does not include the information about the CFR, the terminal device does not send the CSI on the PUCCH for the DRX group or in the DRX group.

21. The communication method according to claim 3,

wherein the first timer is an on duration timer related to one DRX group, wherein second timer set comprises multicast timers corresponding to all the multicasts associated with the first DRX, the first DRX is the DRX group;

the not sending first channel state information CSI and/or SRS comprises:

if DCP is not configured for the terminal device, or the symbol n is not in duration of the on duration timer corresponding to the unicast, or the on duration timer corresponding to the unicast is started or restarted, if CSI masking is configured for the terminal device, if an on duration timer related to one DRX group does not run on the symbol n, if a configuration message of one active BWP associated with the DRX group includes the information about the CFR, or if each on duration timer corresponding to a multicast associated with the DRX group does not run on the symbol n, and a multicast DRX is configured for each multicast that the UE joins and that is associated with the DRX group,

not sending the CSI on the PUCCH for the DRX group or in the DRX group.

22. A communication method, comprising:

not receiving first CSI and/or first sounding reference signal (SRS) at first time if a preset condition is met, wherein the preset condition comprises any one or more of the following:

a first condition, wherein the first condition comprises: the first time does not belong to active time of a first discontinuous reception DRX, and a configuration message of a first bandwidth part BWP does not comprise information about a common frequency resource CFR;

a second condition, wherein the second condition comprises: the first time does not belong to the active time of the first DRX, a configuration message of a second BWP comprises the information about the CFR, and the first time does not belong to active time of a second DRX set;

a fourth condition, wherein the fourth condition comprises: a first timer does not run at the first time, and the configuration message of the first BWP does not comprise the information about the CFR; and

a fifth condition, wherein the fifth condition comprises: the first timer does not run at the first time, the configuration message of the second BWP comprises the information about the CFR, and a

second timer set does not run at the first time;

wherein

the first DRX is used to control monitoring of a terminal device specific control information;

the second DRX set comprises at least one multicast DRX, the at least one multicast DRX
5 comprises a first multicast DRX, and the first multicast DRX is used to control monitoring of control information related to a third multicast service;

running time of the first timer is used by the terminal device to monitor the terminal device specific control information;

the second timer set comprises at least one multicast timer, the at least one multicast timer
10 comprises a first multicast timer, and running time of the first multicast timer is used by the terminal device to monitor control information related to a seventh multicast service;

the first BWP comprises all active BWPs of the terminal device; and

the second BWP comprises one or more active BWPs of the terminal device.

23. The communication method according to claim 22, wherein the first time is a symbol n.

24. The communication method according to claim 22 or 23, wherein the first DRX is a unicast
15 DRX, or a DRX group.

25. The communication method according to any one of claims 22 to 24, wherein the first timer is an on duration timer related to a unicast DRX, or an on duration timer related to one DRX group.

26. The communication method according to any one of claims 22 to 25, wherein the at least
20 one multicast timer is an on duration timer corresponding to a multicast, or an on duration timer related to a multicast DRX.

27. The communication method according to any one of claims 22 to 26, wherein the second DRX set comprises DRXes corresponding to all multicasts that the terminal device joins.

28. The communication method according to any one of claims 22 to 27, wherein the preset
25 condition comprises at least one of the first condition and the second condition, and the not receiving first CSI at first time comprises:

not receiving the first CSI at the first time for a first cell set, wherein

the first cell set comprises at least one cell, and the first cell set is associated with the first DRX.

29. The communication method according to claim 28, wherein the second DRX set comprises
30 DRXes corresponding to all multicasts associated with the first cell set or the first DRX.

30. The communication method according to any one of claims 22 to 29, wherein the preset condition comprises at least one of the fourth condition and the fifth condition, and the not receiving first CSI at first time comprises:

not receiving the first CSI at the first time for the first cell set.

31. The communication method according to claim 30, wherein the second timer set comprises multicast timers corresponding to all the multicasts associated with the first cell set or the first DRX.

32. The communication method according to any one of claims 22 to 31, wherein the preset condition comprises at least one of the second condition and the fifth condition, and the preset condition further comprises:

a multicast DRX is configured for a ninth multicast service set, and the ninth multicast service set comprises all multicast services that the terminal device joins.

33. The communication method according to any one of claims 22 to 32, wherein the preset condition comprises at least one of the second condition and the fifth condition, and the preset condition further comprises:

the multicast DRX is configured for the ninth multicast service set, and the ninth multicast service set comprises all the multicasts associated with the first cell set or the first DRX.

34. The communication method according to any one of claims 22 to 33, wherein the not receiving first CSI at first time comprises any one or more of the following:

not receiving CSI on the PUCCH;

not receiving the periodic CSI on the PUCCH;

not receiving the semi-persistent CSI on the PUCCH;

not receiving the CSI on the PUSCH;

not receiving the semi-persistent CSI on the PUSCH;

not receiving, on the PUCCH, the CSI that is the L1-RSRP;

not receiving, on the PUCCH, the CSI that is not the L1-RSRP;

not receiving, on the PUCCH, the periodic CSI that is the L1-RSRP; and

not receiving, on the PUCCH, the periodic CSI that is not the L1-RSRP.

35. The communication method according to any one of claims 22 to 34, wherein the preset condition comprises at least one of the fourth condition, the fifth condition, and the sixth condition, and the method and/or the preset condition further comprise/comprises:

sending first information, wherein the first information indicates the terminal device to send CSI in running time of a unicast timer and/or in running time of a multicast timer.

36. A communication method, comprising:

if a configuration message of a fourth BWP comprises information about a common frequency resource CFR, and a multicast DRX is configured for a terminal device, running the multicast DRX, wherein the fourth BWP is an active BWP of the terminal device.

37. The communication method according to claim 36, wherein the running the multicast DRX comprises:

starting an eighth timer; and/or
monitoring a PDCCH in active time of the multicast DRX, wherein
the eighth timer is an on duration timer corresponding to the multicast DRX.

38. The communication method according to claim 37, wherein the starting an eighth timer
5 comprises:

starting the eighth timer after drx-SlotOffsetPTM starting from a first subframe, wherein
the first subframe is determined according to the following formula: $[(SFN \times 10) + \text{subframe number}] \bmod (\text{drx-LongCyclePTM}) = \text{drx-StartOffsetPTM}$, wherein

SFN is a system frame number, subframe number is the first subframe, drx-LongCyclePTM is a
10 multicast DRX cycle, drx-StartOffsetPTM is a subframe before the multicast DRX is started, and drx-SlotOffsetPTM is an offset of the multicast DRX.

39. The communication method according to any one of claims 36 to 38, wherein
the CFR is used to receive a multicast service.

40. A communication method, comprising:

15 if a configuration message of a fourth BWP comprises configuration information of a CFR, and
a multicast DRX is configured for a terminal device, running, by a network device, the multicast
DRX, wherein

the running, by a network device, the multicast DRX comprises:

starting, by the network device, an eighth timer; and/or

20 monitoring, by the network device, a PDCCH in active time of the multicast DRX, wherein
the eighth timer is an on duration timer corresponding to the multicast DRX.

41. The communication method according to claim 40, wherein the starting, by the network
device, an eighth timer comprises:

25 starting, by the network device, the eighth timer after drx-SlotOffsetPTM starting from a first
subframe, wherein

the first subframe is determined according to the following formula: $[(SFN \times 10) + \text{subframe number}] \bmod (\text{drx-LongCyclePTM}) = \text{drx-StartOffsetPTM}$, wherein

SFN is a system frame number, subframe number is the first subframe, drx-LongCyclePTM is a
multicast DRX cycle, drx-StartOffsetPTM is a subframe before the multicast DRX is started, and drx-
30 SlotOffsetPTM is an offset of the multicast DRX.

42. The communication method according to claim 40 or 41, wherein
the CFR is used by the terminal device to receive a multicast service.

43. A communication apparatus, comprising a processing unit, wherein

the processing unit is configured to determine not to send first channel state information CSI at first time if a preset condition is met, wherein the preset condition comprises any one or more of the following:

a first condition, wherein the first condition comprises: the first time does not belong to active time of a first discontinuous reception DRX, and a configuration message of a first bandwidth part BWP does not comprise information about a common frequency resource CFR;

a second condition, wherein the second condition comprises: the first time does not belong to the active time of the first DRX, a configuration message of a second BWP comprises the information about the CFR, and the first time does not belong to active time of a second DRX set;

a fourth condition, wherein the fourth condition comprises: a first timer does not run at the first time, and the configuration message of the first BWP does not comprise the information about the CFR;

a fifth condition, wherein the fifth condition comprises: the first timer does not run at the first time, the configuration message of the second BWP comprises the information about the CFR, and a second timer set does not run at the first time; and

wherein

the first DRX is used to control the communication apparatus to monitor specific control information;

the second DRX set comprises at least one multicast DRX, the at least one multicast DRX comprises a first multicast DRX, and the first multicast DRX is used to control monitoring of control information related to a third multicast service;

in running time of the first timer, the processing unit is further configured to monitor the terminal device specific control information, wherein

the second timer set comprises at least one multicast timer, and the at least one multicast timer comprises a first multicast timer; and in running time of the first multicast timer, the processing unit is further configured to monitor control information related to a seventh multicast service, wherein

the first BWP comprises all active BWPs of the terminal device; and

the second BWP comprises one or more active BWPs of the terminal device.

44. A communication apparatus, comprising a processing unit, wherein

the processing unit is configured to determine not to receive first CSI and/or SRS at first time if a preset condition is met, wherein the preset condition comprises any one or more of the following:

a first condition, wherein the first condition comprises: the first time does not belong to active time of a first discontinuous reception DRX, and a configuration message of a first bandwidth part BWP does not comprise information about a common frequency resource CFR;

a second condition, wherein the second condition comprises: the first time does not belong to the active time of the first DRX, a configuration message of a second BWP comprises the information about the CFR, and the first time does not belong to active time of a second DRX set;

a fourth condition, wherein the fourth condition comprises: a first timer does not run at the first time, and the configuration message of the first BWP does not comprise the information about the CFR; and

a fifth condition, wherein the fifth condition comprises: the first timer does not run at the first time, the configuration message of the second BWP comprises the information about the CFR, and a second timer set does not run at the first time;

wherein

the first DRX is used to control monitoring of a terminal device specific control information;

the second DRX set comprises at least one multicast DRX, the at least one multicast DRX comprises a first multicast DRX, and the first multicast DRX is used to control monitoring of control information related to a third multicast service;

running time of the first timer is used by the terminal device to monitor the specific control information;

the second timer set comprises at least one multicast timer, the at least one multicast timer comprises a first multicast timer, and running time of the first multicast timer is used by the terminal device to monitor control information related to a seventh multicast service;

the first BWP comprises all active BWPs of the terminal device; and

the second BWP comprises one or more active BWPs of the terminal device.

45. A communication apparatus, comprising a processing unit, wherein

if a configuration message of a fourth BWP comprises information about a common frequency resource CFR, and a multicast DRX is configured for the communication apparatus,

the processing unit is configured to run the multicast DRX, wherein the fourth BWP is an active BWP of the communication apparatus.

46. A communication apparatus, comprising a processing unit, wherein

if a configuration message of a fourth BWP comprises configuration information of a CFR, and a multicast DRX is configured for a terminal device,

the processing unit is configured to run the multicast DRX; and

the processing unit is further configured to start an eighth timer; and/or

monitor a PDCCH in active time of the multicast DRX, wherein

the eighth timer is an on duration timer corresponding to the multicast DRX.

47. A communication apparatus, comprising:

a processing unit, configured to perform the method according to any one of claims 1 to 21, or any one of claims 22 to 35, or any one of claims 36 to 39, or any one of claims 40 to 42.

48. A communication apparatus, comprising:

5 a memory, configured to store executable instructions, and
a processor, configured to invoke and run the executable instructions in the memory, to perform the method according to any one of claims 1 to 21, or any one of claims 22 to 35, or any one of claims 36 to 39, or any one of claims 40 to 42.

10 49. A computer program product, comprising: computer-readable instructions, wherein when the computer-readable instructions are run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 42.