CLAIMS

What is claimed is:

1. An information transmission method, comprising:

receiving first information, wherein the first information indicates M bandwidth resources, M is a positive integer, and a size of each of the M bandwidth resources is equal to or less than a maximum channel bandwidth supported by a first terminal device, the first terminal device is a first-type terminal device;

receiving a first parameter, wherein the first parameter is a quantity of random access channel occasions for frequency division multiplexing in a time unit;

determining a first bandwidth resource from the M bandwidth resources based on the first information and the first parameter; and

sending uplink information or receiving downlink information on the first bandwidth resource.

2. The method according to claim 1, wherein a value of the first parameter is greater than 4, and

when M=1, the M bandwidth resources are the first bandwidth resource, the first bandwidth resource comprises predefined resources of N random access channel occasions, the random access channel occasions whose quantity is the first parameter comprise the N random access channel occasions, and N is a positive integer; or

when M=1, the M bandwidth resources are the first bandwidth resource, a start resource block of the first bandwidth resource is the same as a start resource block of a first random access channel occasion, and the first random access channel occasion is indicated by first indication information; or

when M>1, each of the M bandwidth resources comprises a resource corresponding to at least one random access channel occasion.

3. The method according to claim 1 or 2, wherein the value of the first parameter is 8, indexes of the random access channel occasions sorted in a first order are 0 to 7, and the first order comprises an ascending order of frequencies.

4. The method according to claim 3, wherein the method further comprises:

receiving the first indication information, wherein when the first indication information comprises one bit, the first indication information indicates an index of the first random access channel occasion in indexes {0, 4}; or when the first indication information comprises two bits, the first indication information indicates an index of the first random access channel occasion in indexes {1, 2, 3, 4}; or when the first indication information comprises three bits, the first indication information indicates an index of the first random access channel occasion in indexes

{0, 1, 2, 3, 4}; or when the first indication information comprises three bits, the first indication information indicates an index of the first random access channel occasion in indexes {0, 1, 2, 3, 4, 5, 6, 7}; or

when does not receive the first indication information, an index of the first random access channel occasion is 0.

5. The method according to any one of claims 1 to 4, wherein the first information indicates the M bandwidth resources; and

a size of each of the M bandwidth resources is predefined; or

when M=2, one bandwidth resource in the bandwidth resources comprises resources of random access channel occasions {0, 1, 2, 3}, and the other bandwidth resource in the bandwidth resources comprises resources of random access channel occasions {4, 5, 6, 7}; or

when M>1, remaining (M–1) bandwidth resources are determined based on a first candidate bandwidth resource, and the first candidate bandwidth resource is indicated by using first signaling.

6. The method according to claim 1, wherein when M>1, the method further comprises:

receiving second indication information, wherein the second indication information indicates a second bandwidth resource;

sending a random access preamble on the first bandwidth resource; and

sending on the second bandwidth resource, a message 3 in a random access process or a physical uplink control channel for feeding back a contention resolution message.

7. The method according to claim 6, wherein the second indication information is carried in one or more of a random access response message, downlink control information for scheduling the random access response message, a contention resolution message, and downlink control information for scheduling the contention resolution message; and/or

the second indication information is carried in an uplink grant of each media access control random access response in a random access response message.

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

sending the random access preamble on the first bandwidth resource; and

receiving third indication information, wherein the third indication information indicates a bandwidth resource for the first terminal device to send a message 3 in the random access process and/or the physical uplink control channel for feeding back a contention resolution message.

9. The method according to claim 8, wherein

a bit status of the third indication information indicates the bandwidth resource for sending the message 3 in the random access process and/or the physical uplink control channel for feeding back the contention resolution message.

10. The method according to claims 8 or 9, wherein

the third indication information is an identifier information, and the identifier information is included in a downlink control information (DCI) or higher layer signaling.

11. The method according to any one of claims 1 to 10, wherein

the first-type terminal device is reduced capability (REDCAP) terminal device.

12. The method according to claim 10, wherein

the identifier information comprises 1 bit.

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

obtaining fourth indication information, wherein the fourth indication information indicates that an association configuration between an SSB and a random access channel occasion is a first association configuration or a second association configuration, and the association configuration is an association configuration between a quantity of SSBs and a quantity of random access channel occasions.

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

if receives fourth indication information, the fourth indication information indicates that an association configuration between an SSB and a random access is a first association configuration; or if does not receive fourth indication information, an association configuration between an SSB and a random access is a second association configuration; or

if receives fourth indication information, the fourth indication information indicates that an association configuration between an SSB and a random access channel occasion is a second association configuration; or if does not receive fourth indication information, an association configuration between an SSB and a random access channel occasion is a first association configuration.

15. The method according to any one of claims 1 to 14, wherein the first parameter is carried in random access channel configuration information.

16. The method according to any one of claims 1 to 15, wherein the first information comprises system information.

17. An information transmission method, comprising:

sending first information to a first terminal device, wherein the first information indicates M bandwidth resources, M is a positive integer, a size of each of the M bandwidth resources is equal to or less than a maximum channel bandwidth supported by the first terminal device, and the first terminal device is a first-type terminal device;

sending a first parameter, wherein the first parameter is a quantity of random access channel occasions for frequency division multiplexing in a time unit; and

receiving uplink information from the first terminal device, or sending downlink information to the first terminal device on a first bandwidth resource, wherein the first bandwidth resource is

determined by the first terminal device from the M bandwidth resources based on the first information and the first parameter.

18. The method according to claim 17, wherein a value of the first parameter is greater than 4, and

when M=1, the M bandwidth resources are the first bandwidth resource, the first bandwidth resource comprises predefined resources of N random access channel occasions, the random access channel occasions whose quantity is the first parameter comprise the N random access channel occasions, and N is a positive integer; or

when M=1, sends first indication information, wherein the first indication information indicates a first random access channel occasion, a start resource block of the first bandwidth resource is the same as a start resource block of the first random access channel occasion, and the M bandwidth resources are the first bandwidth resource; or

when M>1, each of the M bandwidth resources comprises a resource corresponding to at least one random access channel occasion.

19. The method according to claim 17 or 18, wherein the value of the first parameter is 8, indexes of the random access channel occasions sorted in a first order are 0 to 7, and the first order comprises an ascending order of frequencies.

20. The method according to claim 19, wherein

when the first indication information comprises one bit, the first indication information indicates an index of the first random access channel occasion in indexes {0, 4}; or

when the first indication information comprises two bits, the first indication information indicates an index of the first random access channel occasion in indexes {1, 2, 3, 4}; or

when the first indication information comprises three bits, the first indication information indicates an index of the first random access channel occasion in indexes {0, 1, 2, 3, 4}; or

when the first indication information comprises three bits, the first indication information indicates an index of the first random access channel occasion in indexes {0, 1, 2, 3, 4, 5, 6, 7}; or

when does not send the first indication information, an index of the first random access channel occasion is 0.

21. The method according to any one of claims 17 to 20, wherein the first information indicates the M bandwidth resources; and

a size of each of the M bandwidth resources is predefined; or

when M=2, one bandwidth resource in the bandwidth resources comprises resources of random access channel occasions {0, 1, 2, 3}, and the other bandwidth resource in the bandwidth resources comprises resources of random access channel occasions {4, 5, 6, 7}; or

when M>1, sends first signaling, wherein the first signaling is used to indicate a first

candidate bandwidth resource, and remaining (M–1) bandwidth resources are determined based on the first candidate bandwidth resource.

22. The method according to claim 17, wherein when M>1, the method further comprises:

sending second indication information, wherein the second indication information indicates a second bandwidth resource;

receiving a random access preamble on the first bandwidth resource; and

receiving on the second bandwidth resource, a message 3 in a random access process or a physical uplink control channel for feeding back a contention resolution message.

23. The method according to claim 22, wherein the second indication information is carried in one or more of a random access response message, downlink control information for scheduling the random access response message, a contention resolution message, and downlink control information for scheduling the contention resolution message; and/or

the second indication information is carried in an uplink grant of each media access control random access response in a random access response message.

24. The method according to claim 17, wherein the method further comprises:

receiving a random access preamble on the first bandwidth resource; and

sending third indication information, wherein the third indication information indicates a bandwidth resource for a message 3 in the random access process and/or the physical uplink control channel for feeding back a contention resolution message.

25. The method according to claim 24, wherein

a bit status of the third indication information indicates the bandwidth resource for the message 3 in the random access process and/or the physical uplink control channel for feeding back the contention resolution message.

26. The method according to claim 24 or 25, wherein

the third indication information is an identifier information, and the identifier information is included in a downlink control information (DCI) or higher layer signaling

27. The method according to any one of claims 17 to 26, wherein

the first-type terminal device is reduced capability (REDCAP) terminal device.

28. The method according to claim 26, wherein

the identifier information comprises 1 bit.

29. The method according to claim 17, wherein the method further comprises:

sending fourth indication information, wherein the fourth indication information indicates that an association configuration between an SSB and a random access channel occasion is a first association configuration or a second association configuration, and the association configuration is an association configuration between a quantity of SSBs and a quantity of random access

channel occasions.

30. The method according to claim 17, wherein the method further comprises:

if sends fourth indication information, the fourth indication information indicates that an association configuration between an SSB and a random access channel occasion is a first association configuration; or if does not send fourth indication information, an association configuration between an SSB and a random access channel occasion is a second association configuration; or

if sends fourth indication information, the fourth indication information indicates that an association configuration between an SSB and a random access channel occasion is a second association configuration; or if does not send fourth indication information, an association configuration between an SSB and a random access channel occasion is a first association configuration.

31. The method according to any one of claims 17 to 30, wherein the first parameter is carried in random access channel configuration information.

32. The method according to any one of claims 17 to 31, wherein the first information comprises system information.

33. A communication apparatus, comprising a processor, wherein the processor is connected to a memory, the memory is configured to store a computer program, and the processor is configured to execute the computer program stored in the memory, so that the apparatus performs the method according to any one of claims 1 to 16, or performs the method according to any one of claims 17 to 32.

34. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store a computer program, and when the computer program runs on a computer, the computer is enabled to perform the method according to any one of claims 1 to 16, or the computer is enabled to perform the method according to any one of claims 17 to 32.

35. A chip, comprising a processor and a communication interface, wherein the processor is configured to read instructions to perform the method according to any one of claims 1 to 16, or perform the method according to any one of claims 17 to 32.

36. A communication apparatus, comprising modules configured to perform the method according to any one of claims 1 to 16 or claims 17 to 32.