

WHAT IS CLAIMED IS:

1. A terminal device scheduling method, performed by a terminal device, comprising:
determining a resource corresponding to a random access message based on a physical layer channel or signal processing capability of the terminal device; and
sending the random access message through the resource to a network device, to enable the network device to determine a random access message processing time delay of the terminal device based on the resource corresponding to the random access message and to schedule a transmission of a subsequent random access message of the terminal device.
2. The method of claim 1, wherein a physical layer channel or signal comprises one or more of:
a Physical Random Access Channel (PRACH), a Physical Uplink Shared Channel (PUSCH), a Physical Downlink Shared Channel (PDSCH), a Physical Uplink Control Channel (PUCCH), a Physical Downlink Control Channel (PDCCH), a Channel State Information Reference Signal (CSI-RS), a Sounding Reference Signal (SRS), a Phase Tracking Reference Signal (PTRS), or a Tracking Reference Signal (TRS).
3. The method of claim 1 or 2, further comprising:
receiving configuration or indication information sent by the network device;
wherein the configuration or indication information is used for configuring or indicating candidate resource groups corresponding to at least two types of physical layer channel or signal processing capabilities of terminal devices.
4. The method of claim 3, wherein the physical layer channel or signal processing capabilities of different terminal devices correspond to different candidate resource groups.
5. The method of claim 3 or 4, wherein determining the resource corresponding to the random access message based on the physical layer channel or signal processing capability of the terminal device comprises:
in response to the terminal device being an evolved reduced capability terminal device or in response to the physical layer channel or signal processing capability of the terminal device being a relaxed processing capability, determining a candidate resource group of the terminal device based on a mapping relationship between candidate resource groups and the physical layer channel or signal processing capabilities of the terminal devices; and
determining the resource for transmitting the random access message from the candidate resource group of the terminal device.
6. The method of claim 5, wherein the random access message is a first random access message; or

the random access message is a third random access message, and the mapping relationship between the candidate resource groups and the physical layer channel or signal processing capabilities of the terminal devices is determined based on first time intervals corresponding to at least two types of physical layer channel or signal processing capabilities, first time interval being a time interval between a time when the terminal device receives a last symbol of a second random access message and a time when a first symbol of the third random access message is sent.

7. The method of claim 6, wherein the configuration or indication information carries the first time intervals corresponding to the at least two types of physical layer channel or signal processing capabilities or carries indexes of the first time intervals corresponding to the at least two types of physical layer channel or signal processing capabilities; or

the configuration or indication information carries an association relationship between the first time intervals corresponding to the at least two types of physical layer channel or signal processing capabilities or carries an index of the association relationship; or

the configuration or indication information carries a first time interval corresponding to at least one type of physical layer channel or signal processing capability or carries an index of the first time interval corresponding to the at least one type of physical layer channel or signal processing capability; and

wherein an association relationship between first time intervals corresponding to at least two types of physical layer channel or signal processing capabilities is preset by a protocol.

8. The method of claim 6 or 7, wherein the resource comprises at least one of: a bandwidth part, a random access occasion, a preamble sequence in a shared random access occasion, or a Physical Uplink Shared Channel (PUSCH) time or frequency domain resource.

9. A terminal device scheduling method, performed by a network device, comprising:
receiving a random access message sent by a terminal device;

determining a random access message processing time delay of the terminal device based on a resource corresponding to the random access message; and

scheduling a transmission of a subsequent random access message of the terminal device based on the random access message processing time delay of the terminal device.

10. The method of claim 9, further comprising:

sending configuration or indication information to the terminal device;

wherein the configuration or indication information is used for configuring or indicating candidate resource groups corresponding to at least two types of physical layer channel or signal processing capabilities of terminal devices.

11. The method of claim 10, wherein a physical layer channel or signal comprises one or more

of:

a Physical Random Access Channel (PRACH), a Physical Uplink Shared Channel (PUSCH), a Physical Downlink Shared Channel (PDSCH), a Physical Uplink Control Channel (PUCCH), a Physical Downlink Control Channel (PDCCH), a Channel State Information Reference Signal (CSI-RS), a Sounding Reference Signal (SRS), a Phase Tracking Reference Signal (PTRS), or a Tracking Reference Signal (TRS); or

the physical layer channel or signal processing capabilities of different terminal devices correspond to different candidate resource groups.

12. The method of claim 11, wherein determining the random access message processing time delay of the terminal device based on the resource corresponding to the random access message comprises:

in response to the resource corresponding to the random access message being a set resource in at least two candidate resource groups, determining that the random access message processing time delay of the terminal device is a relaxed delay.

13. The method of claim 12, wherein the random access message is a first random access message; or

the random access message is a third random access message, and a mapping relationship between candidate resource groups and the physical layer channel or signal processing capabilities of the terminal devices is determined based on first time intervals corresponding to at least two types of physical layer channel or signal processing capabilities, the first time interval being a time interval between a time when the terminal device receives a last symbol of a second random access message and a time when a first symbol of the third random access message is sent.

14. The method of claim 13, wherein the configuration or indication information carries the first time intervals corresponding to the at least two types of physical layer channel or signal processing capabilities or carries indexes of the first time intervals corresponding to the at least two types of physical layer channel or signal processing capabilities; or

the configuration or indication information carries an association relationship between first time intervals corresponding to the at least two types of physical layer channel or signal processing capabilities or carries an index of the association relationship; or

the configuration or indication information carries a first time interval corresponding to at least one type of physical layer channel or signal processing capability or carries an index of the first time interval corresponding to the at least one type of physical layer channel or signal processing capability; and

wherein an association relationship between the first time intervals corresponding to the at

least two types of physical layer channel or signal processing capabilities is a preset association relationship.

15. The method of claim 13 or 14, wherein the resource comprises at least one of a bandwidth part, a random access occasion, a preamble sequence in a shared random access occasion, or a Physical Uplink Shared Channel (PUSCH) time or frequency domain resource.

16. A terminal device scheduling method, performed by a network device, comprising:
scheduling a transmission of a subsequent random access message of a terminal device in a serving cell where the network device is located based on a relaxed random access message processing time delay of the terminal device.

17. The method of claim 16, wherein the serving cell supports an access of a reduced capability terminal device.

18. A communication device, comprising a processor and a memory, wherein the memory has computer instructions stored therein and when the processor executes the computer instructions stored in the memory, the device is caused to perform the method of any one of claims 1 to 8.

19. A communication device, comprising a processor and a memory, wherein the memory has a computer program stored therein and when the processor executes the computer program stored in the memory, the device is caused to perform the method of any one of claims 9 to 15 or the method of any one of claim 16 or 17.

20. A computer-readable storage medium, having instructions stored thereon, wherein when the instructions are executed, the method of any one of claims 1 to 17 is performed.