

CLAIMS

What is claimed is:

1. A connection establishment method, applied to a first terminal device and comprising:
 - sending a first request message to a network device, wherein the first request message is used to request, from the network device, related information of a unicast connection between the first terminal device and a second terminal device; and
 - receiving a first response message sent by the network device;wherein the first request message is a resource request message, and the resource request message comprises at least one of the following:
 - a link ID of the unicast connection;
 - resource related information of a target terminal;
 - quality of service (QoS) parameter information negotiated between the first terminal device and the second terminal device;
 - capability information of the target terminal;
 - physical cell ID and frequency information of the target terminal;
 - a physical cell ID of the target terminal; and
 - a cell global ID of the target terminal;or
 - the first request message is a unicast connection establishment request message, and the unicast connection establishment request message comprises at least one of the following:
 - a link ID of the unicast connection;
 - resource related information of a target terminal;
 - QoS parameter information negotiated between the first terminal device and the second terminal device;
 - capability information of the target terminal;
 - physical cell ID and frequency information of the target terminal;
 - a physical cell ID of the target terminal;
 - a cell global ID of the target terminal; and
 - a vehicle-to-everything (V2X) unicast connection establishment request cause, wherein the target terminal is at least one of the first terminal device and the second terminal device.

2. The method according to claim 1, wherein
the resource request message further comprises a target terminal ID; or
the unicast connection establishment request message further comprises a target terminal ID.
3. The method according to claim 2, wherein the resource related information of the target terminal comprises at least one of the following:
information about a resource mode in which the target terminal currently works;
information about a resource pool selected by the target terminal;
information about a resource use status of the target terminal; and
information about a current radio resource control state of the target terminal.
4. The method according to claim 1, wherein the first response message is an RRC configuration message or a unicast connection establishment message; and
the first response message comprises at least one of the following:
radio bearer configuration information of a target terminal;
resource configuration information of the target terminal;
physical layer configuration information of the target terminal;
indication information indicating whether to accept QoS;
information about an accepted QoS parameter;
a link ID corresponding to the radio bearer configuration information; and
a group of first terminal device IDs and second terminal device IDs corresponding to the radio bearer configuration information, wherein
the target terminal is at least one of the first terminal device and the second terminal device.
5. The method according to claim 4, wherein the resource configuration information comprises at least one of the following:
information about a transmitting resource for feedback control information of a sidelink;
information about a transmitting resource for control signaling; and
information about a transmitting resource for service data.
6. The method according to claim 1, wherein when the network device does not send configuration information to the second terminal device, the method further comprises:
sending a second RRC message to the second terminal device, wherein
the second RRC message comprises at least one of the following:

radio bearer configuration information of a target terminal;
resource configuration information of the second terminal device;
physical layer configuration information of the second terminal device;
a link ID corresponding to the radio bearer configuration information; and
a group of first terminal device IDs and second terminal device IDs corresponding to the radio bearer configuration information, wherein

the target terminal is at least one of the first terminal device and the second terminal device;

or,

when the network device sends a first RRC message to the second terminal device, the method further comprises:

sending a third RRC message to the second terminal device, wherein

the first RRC message comprises at least one of the following:

resource configuration information of the second terminal device; and

physical layer configuration information of the second terminal device; and

the third RRC message comprises at least one of the following:

radio bearer configuration information of a target terminal;

a link ID corresponding to the radio bearer configuration information; and

a group of first terminal device IDs and second terminal device IDs corresponding to the radio bearer configuration information, wherein

the target terminal is at least one of the first terminal device and the second terminal device.

7. The method according to claim 1, wherein the first response message is an RRC reject message or a unicast connection reject message; and

the first response message comprises at least one of the following:

indication information indicating whether to reject QoS;

a connection reject cause; and

information about a wait time.

8. The method according to claim 1, wherein the first terminal device is a transmitting-end device, and the second terminal device is a receiving-end device;

before the sending a first request message to a network device, the method further comprises:

sending a direct communication request message to the second terminal device; and

receiving a direct communication accept message sent by the second terminal device;

or

before the sending a first request message to a network device, the method further comprises:

sending, to the network device, a direct communication request message for the second terminal device; and

receiving a direct communication accept message for the first terminal device that is sent by the network device; or

when the first request message is a unicast connection establishment request message and the first response message is a unicast connection establishment message, the unicast connection establishment request message comprises a direct communication request message, and the unicast connection establishment message comprises a direct communication accept message;

or,

the first terminal device is a receiving-end device, and the second terminal device is a transmitting-end device;

before the sending a first request message to a network device, the method further comprises:

receiving a direct communication request message sent by the second terminal device; and

after the receiving a first response message sent by the network device, the method further comprises:

sending a direct communication accept message to the second terminal device;

or

before the sending a first request message to a network device, the method further comprises:

receiving a direct communication request message of the second terminal device for the first terminal device that is sent by the network device; and

after the receiving a first response message sent by the network device, the method further comprises:

sending, to the network device, a direct communication accept message for the second terminal device;

or

before the sending a first request message to a network device, the method further comprises:

receiving a unicast connection establishment request message sent by the second terminal device, wherein the unicast connection establishment request message comprises a direct communication request message; and

after the receiving a first response message sent by the network device, the method further comprises:

sending a unicast connection establishment message to the second terminal device, wherein the unicast connection establishment message comprises a direct communication accept message.

9. The method according to claim 8, wherein the direct communication request message comprises at least one of the following:

information about a requested QoS parameter;

a target terminal ID;

sidelink service information;

V2X service information;

resource related information of the transmitting-end device;

physical cell ID and frequency information of the transmitting-end device;

a physical cell ID of the transmitting-end device;

a cell global ID of the transmitting-end device;

user information of the target terminal;

IP address configuration information of the transmitting-end device; and

security related information of the transmitting-end device, wherein

the target terminal is at least one of the first terminal device and the second terminal device;

and/or,

the direct communication accept message comprises at least one of the following:

information about an accepted QoS parameter;

resource related information of the receiving-end device;

physical cell ID and frequency information of the receiving-end device;

a physical cell ID of the receiving-end device;

a cell global ID of the receiving-end device;

a target terminal ID;

a link ID of the unicast connection;

user information of the target terminal; and

IP address configuration information of the receiving-end device, wherein

the target terminal is at least one of the first terminal device and the second terminal device.

10. A connection establishment method, applied to a network device and comprising:

receiving a first request message sent by a first terminal device, wherein the first request message is used to request, from the network device, related information of a unicast connection between the first terminal device and a second terminal device; and sending a first response message to the first terminal device;

wherein the first request message is a resource request message, and the resource request message comprises at least one of the following:

a link ID of the unicast connection;

resource related information of a target terminal;

QoS parameter information negotiated between the first terminal device and the second terminal device;

capability information of the target terminal;

physical cell ID and frequency information of the target terminal;

a physical cell ID of the target terminal; and

a cell global ID of the target terminal;

or

the first request message is a unicast connection establishment request message, and the unicast connection establishment request message comprises at least one of the following:

a link ID of the unicast connection;

resource related information of a target terminal;

QoS parameter information negotiated between the first terminal device and the second terminal device;

capability information of the target terminal;

physical cell ID and frequency information of the target terminal;

a physical cell ID of the target terminal;

a cell global ID of the target terminal; and

a V2X unicast connection establishment request cause, wherein

the target terminal is at least one of the first terminal device and the second terminal device.

11. The method according to claim 10, wherein

the resource request message further comprises a target terminal ID; or

the unicast connection establishment request message further comprises a target terminal ID.

12. The method according to claim 11, wherein the resource related information of the target terminal comprises at least one of the following:

information about a mode in which the target terminal currently works;

information about a resource pool selected by the target terminal;

information about a resource use status of the target terminal; and

information about a current RRC state of the target terminal.

13. The method according to claim 10, wherein the first response message is an RRC configuration message or a unicast connection establishment message; and

the first response message comprises at least one of the following:

radio bearer configuration information of a target terminal;

resource configuration information of the target terminal;

physical layer configuration information of the target terminal;

indication information indicating whether to accept QoS;

information about an accepted QoS parameter;

a link ID corresponding to the radio bearer configuration information; and

a group of first terminal device IDs and second terminal device IDs corresponding to the radio bearer configuration information, wherein

the target terminal is at least one of the first terminal device and the second terminal device.

14. The method according to claim 13, wherein the resource configuration information comprises at least one of the following:

information about a transmitting resource for feedback control information of a sidelink;

information about a transmitting resource for control signaling; and

information about a transmitting resource for service data.

15. The method according to claim 10, wherein after the receiving a first request message sent by the first terminal device, the method further comprises:

sending a first RRC message to the second terminal device, wherein

the first RRC message comprises at least one of the following:

resource configuration information of the second terminal device; and

physical layer configuration information of the second terminal device; and

or

the first RRC message comprises at least one of the following:

radio bearer configuration information of a target terminal;

resource configuration information of the second terminal device; and

physical layer configuration information of the second terminal device; and

a link ID corresponding to the radio bearer configuration information; and

a group of first terminal device IDs and second terminal device IDs corresponding to the radio bearer configuration information, wherein

the target terminal is at least one of the first terminal device and the second terminal device.

16. The method according to claim 10, wherein the first response message is an RRC reject message or a unicast connection reject message; and

the first response message comprises at least one of the following:

indication information indicating whether to reject QoS;

a connection reject cause; and

information about a wait time.

17. The method according to claim 10, wherein the first terminal device is a transmitting-end device, and the second terminal device is a receiving-end device;

before the receiving a first request message sent by the first terminal device, the method further comprises: receiving a direct communication request message for the second terminal device that is sent by the first terminal device; and

sending a direct communication accept message for the first terminal device to the first terminal device; or

when the first request message is a unicast connection establishment request message and the first response message is a unicast connection establishment message, the unicast connection establishment request message comprises a direct communication request message, and the unicast connection establishment message comprises a direct communication accept message;

or,

the first terminal device is a receiving-end device, and the second terminal device is a transmitting-end device;

before the receiving a first request message sent by the first terminal device, the method further comprises: sending a direct communication request message for the first terminal device to the first terminal device; and

after the sending a first response message to the first terminal device, the method further comprises:

receiving a direct communication accept message for the second terminal device that is sent by the first terminal device.

18. The method according to claim 17, wherein the direct communication request message comprises at least one of the following:

- information about a requested QoS parameter;
- a target terminal ID;
- sidelink service information;
- V2X service information;
- resource related information of the transmitting-end device;
- physical cell ID and frequency information of the transmitting-end device;
- a physical cell ID of the transmitting-end device;
- a cell global ID of the transmitting-end device;
- user information of the target terminal;
- IP address configuration information of the transmitting-end device; and
- security related information of the transmitting-end device, wherein

the target terminal is at least one of the transmitting-end device and the receiving-end device;

and/or,

the direct communication accept message comprises at least one of the following:

- information about an accepted QoS parameter;
- resource related information of the receiving-end device;
- physical cell ID and frequency information of the receiving-end device;
- a physical cell ID of the receiving-end device;
- a cell global ID of the receiving-end device;

a target terminal ID;

a link ID of the unicast connection;

user information of the target terminal; and

IP address configuration information of the receiving-end device, wherein

the target terminal is at least one of the transmitting-end device and the receiving-end device.

19. A terminal device, comprising a memory, a processor, and a program stored on the memory and executable by the processor, wherein when the program is executed by the processor, the processor is configured to implement:

sending a first request message to a network device, wherein the first request message is used to request, from the network device, related information of a unicast connection between the first terminal device and a second terminal device; and

receiving a first response message sent by the network device;

wherein the first request message is a resource request message, and the resource request message comprises at least one of the following:

a link ID of the unicast connection;

resource related information of a target terminal;

quality of service (QoS) parameter information negotiated between the first terminal device and the second terminal device;

capability information of the target terminal;

physical cell ID and frequency information of the target terminal;

a physical cell ID of the target terminal; and

a cell global ID of the target terminal;

or

the first request message is a unicast connection establishment request message, and the unicast connection establishment request message comprises at least one of the following:

a link ID of the unicast connection;

resource related information of a target terminal;

QoS parameter information negotiated between the first terminal device and the second terminal device;

capability information of the target terminal;

physical cell ID and frequency information of the target terminal;

a physical cell ID of the target terminal;

a cell global ID of the target terminal; and

a vehicle-to-everything (V2X) unicast connection establishment request cause, wherein

the target terminal is at least one of the first terminal device and the second terminal device.

20. A network device, comprising a memory, a processor, and a program stored on the memory and executable by the processor, wherein when the program is executed by the processor, the steps of the connection establishment method according to any one of claims 10 to 18 are implemented.