

For example, in the process of S102, if network states of one or more of the at least one first radio access technology cannot ensure service transmission (for example, the network states get poor), one or more of the at least one second radio access technology may be switched into the active state.

5 For example, one or more of the at least one first radio access technology causes a service interruption due to coverage or a failure. Alternatively, signal quality of one or more of the at least one first radio access technology is lower than a preset quality threshold value. Alternatively, the at least one first radio access technology has a Radio Link Failure (RLF). Alternatively, the at least one first radio access technology has an
10 RLF, and fails in radio link recovery. Alternatively, the transmission device predicts that the at least one first radio access technology is about to fail.

 In such a manner, in the embodiment of the present disclosure, when part of radio access technologies in the active state cannot ensure service transmission, one or more in the standby state are switched into the active state and start data transmission,
15 so that the continuity of a service may be ensured, and service transmission performance may further be improved.

 Optionally, in the process of S102, the at least one second radio access technology may perform prefetch or cache on transmission data of the service. For example, transmission data of a preset data volume threshold value may be prefetched
20 or cached. Alternatively, transmission data of a preset time length may be prefetched or cached. That is, transmission data of a certain time length or data volume may be prefetched or cached.

 Here, the data volume threshold value or the time length may be determined by the transmission device according to a service characteristic of the service, a mobility
25 characteristic of the terminal and a network condition. That is, the time length or data volume of the prefetched or cached transmission data may be determined by such factors as the service characteristic, mobility of the terminal and the network condition or the like.

 Herein, the service characteristic may include a data packet size, a sending
30 frequency, a time delay, a time delay jitter requirement and the like. Herein, the mobility characteristic of the terminal may include a mobile speed of the terminal and the like. The network condition may include intensities and quality of transmitted signals, received by the terminal, of base stations of the multiple radio access technologies,

maximum transmitted power and antenna gains of the multiple radio access technologies of the terminal and the like.

In such a manner, each second radio access technology in the standby state prefetches or caches the transmission data. When the second radio access technology is
5 switched into the active state for data transmission, the continuity of the service may further be ensured, and the transmission performance may be improved.

Optionally, as another example, in the execution process of S102, the transmission device may monitor the network state of the at least one second radio access technology in the standby state. When it is detected that the network states of one
10 or more of the at least one second radio access technology cannot be in the standby state (for example, the transmission device is not located in coverage of one or more of the at least one second radio access technology any longer), at least one third radio access technology is selected to replace the one or more of the at least one second radio access technology.

For example, if a certain second radio access technology in the at least one
15 second radio access technology is unsuitable to be kept in the standby state any longer for a certain reason, the certain second radio access technology may be deleted from a list of the at least one second radio access technology in the standby state.

For example, if the terminal is not located in coverage of a second radio access
20 technology B1 any longer due to mobility of the terminal, the second radio access technology B1 may be regulated not to be in the standby state any longer. If the second radio access technology B1 has established a connection previously, the connection may be cut off at this moment.

Furthermore, the transmission device may reselect and set another suitable radio
25 access technology to be in the standby state. For example, due to the mobility of the terminal, an intensity of a signal, which may be received by the terminal, of a third radio access technology is gradually enhanced, and when the intensity of the signal is higher than a preset intensity threshold value, the third radio access technology may be determined to be in the standby state.

Optionally, as another example, the transmission device may notify an opposite
30 device of the transmission device of state changes of the multiple radio access technologies. In such a manner, information synchronization of the states of the radio access technologies between the transmission device and the opposite device

embodiment of the present disclosure. The transmission device 200 shown in Fig. 2 may adopt multiple radio access technologies for communication, and includes a determination unit 201 and a transmission unit 202.

5 The determination unit 201 is configured to determine that at least one first radio access technology in the multiple radio access technologies is in an active state.

The transmission unit 202 is configured to perform service transmission by using the at least one first radio access technology determined by the determination unit.

10 In such a manner, in the embodiment of the present disclosure, the transmission device determines that the at least one first radio access technology in the multiple radio access technologies is in the active state, and performs service transmission by using the radio access technology in the active state, so that service transmission efficiency may be ensured.

Optionally, as an example, the transmission device 200 may further include a selection unit, configured to select the multiple radio access technologies for a service.

15 Optionally, in the embodiment of the present disclosure, the multiple radio access technologies may further include at least one second radio access technology, and the determination unit 201 may further be configured to determine that the at least one second radio access technology is in a standby state, wherein the standby state refers to that the second radio access technology has established a connection but there
20 is no data transmission, or refers to that the second radio access technology does not establish any connection but may establish a connection within a preset time length. That is, although not establishing any connection, the second radio access technology may establish the connection at a very high speed.

25 Here, establishing connection may include having a connection ID and a connection context. Moreover, the at least one second radio access technology which is in the standby state and has established the connection may share a connection context (for example, a data packet transmission and a queuing condition) of the at least one first radio access technology.

30 Optionally, as an example, the determination unit 201 may further be configured to determine that the at least one second radio access technology in the standby state prefetches or caches transmission data of the service. Specifically, transmission data of a preset data volume threshold value may be prefetched or cached. Alternatively, transmission

CLAIMS

1. A method for service transmission, comprising:

determining, by a transmission device, that at least one first radio access
5 technology in multiple radio access technologies is in an active state; and

performing, by the transmission device, the service transmission by using the at
least one first radio access technology;

wherein the multiple radio access technologies support a service to be
transmitted by the transmission device;

10 the active state is a state in which the at least one first radio access technology
has established a connection and performs a data transmission;

the multiple radio access technologies further comprise at least one second
radio access technology;

wherein the at least one second radio access technology prefetches or caches
15 transmission data of a service,

wherein prefetching or caching the transmission data of the service comprises:

prefetching or caching transmission data of a preset data volume threshold
value; or, prefetching or caching transmission data of a preset time length,

wherein the data volume threshold value or the time length is determined by
20 the transmission device according to a service characteristic of the service, a mobility
characteristic of a terminal and a network condition.

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

determining, by the transmission device, that the at least one second radio
25 access technology is in a standby state, wherein the standby state refers to that the at
least one second radio access technology has established a connection but there is no
data transmission, or refers to that the at least one second radio access technology does
not establish any connection but can establish a connection within a preset time length.

30 3. The method according to claim 2, wherein establishing the connection comprises:
having a connection Identifier (ID) and a connection context.

4. The method according to claim 2, wherein the at least one second radio access technology shares a connection context of the at least one first radio access technology.

5. The method according to any one of claims 1-4, further comprising:

5 in a process of the service transmission, monitoring a network state of the at least one second radio access technology; and

 when it is detected that network states of one or more of the at least one second radio access technology is degraded and cannot be in the standby state, selecting at least one third radio access technology to replace the one or more of the at least one
10 second radio access technology.

6. The method according to any one of claims 1-4, further comprising:

 in a process of the service transmission, monitoring a network state of the at least one first radio access technology; and

15 when it is detected that network states of one or more of the at least one first radio access technology cannot ensure the service transmission, switching one or more of the at least one second radio access technology into the active state and performing service transmission by using the one or more of the at least one second radio access technology,

20 wherein the condition that the network states of the one or more of the at least one first radio access technology cannot ensure the service transmission comprises that:
 the one or more of the at least one first radio access technology causes a service interruption due to coverage or a failure;

 or,

25 signal quality of the one or more of the at least one first radio access technology is lower than a preset quality threshold value;

 or,

 the at least one first radio access technology has a Radio Link Failure (RLF);

 or,

30 the at least one first radio access technology has an RLF, and fails in radio link recovery;

 or,

 the transmission device predicts that the at least one first radio access

technology is about to fail.

7. The method according to claim 6, further comprising:

notifying an opposite device of the transmission device of state changes of the

5 one or more of the at least one second radio access technology,

wherein the transmission device is a terminal, and the opposite device is a network device; or,

the transmission device is a network device, and the opposite device is a terminal; or,

10 the transmission device is a terminal, and the opposite device is another terminal.

8. The method according to any one of claims 1-7, before determining that the at least one first radio access technology in the multiple radio access technologies is in the active state, further comprising:

15

selecting the multiple radio access technologies for the service.

9. A transmission device, comprising:

a determination unit, configured to determine that at least one first radio access technology in multiple radio access technologies is in an active state; and

20

a transmission unit, configured to perform service transmission by using the at least one first radio access technology determined by the determination unit;

wherein the multiple radio access technologies support a service to be transmitted by the transmission device;

25 the active state is a state in which the at least one first radio access technology has established a connection and performs a data transmission;

the multiple radio access technologies further comprise at least one second radio access technology;

30 wherein the determination unit is further configured to: determine that the at least one second radio access technology prefetches or caches transmission data of a service,

wherein the determination unit is specifically configured to:

prefetch or cache transmission data of a preset data volume threshold value; or,

prefetch or cache transmission data of a preset time length,

wherein the data volume threshold value or the time length is determined by the transmission device according to a service characteristic of the service, a mobility characteristic of a terminal and a network condition.

5

10. The transmission device according to claim 9, wherein the determination unit is further configured to:

determine that the at least one second radio access technology is in a standby state, wherein the standby state refers to that the at least one second radio access technology has established a connection but there is no data transmission, or refers to that the at least one second radio access technology does not establish any connection but can establish a connection within a preset time length.

10

11. The transmission device according to claim 10, wherein establishing the connection comprises: having a connection Identifier (ID) and a connection context.

15

12. The transmission device according to claim 10, wherein the at least one second radio access technology shares a connection context of the at least one first radio access technology.

20

13. The transmission device according to any one of claims 9-12, wherein the transmission unit is further configured to:

25

in a process of the service transmission, monitor a network state of the at least one second radio access technology; and

when detecting that network states of one or more of the at least one second radio access technology is degraded and cannot be in the standby state, select at least one third radio access technology to replace the one or more of the at least one second radio access technology.

30

14. The transmission device according to any one of claims 9-12, wherein the transmission unit is further configured to:

in a process of the service transmission, monitor a network state of the at least

one first radio access technology; and

when detecting that network states of one or more of the at least one first radio access technology cannot ensure the service transmission, switch one or more of the at least one second radio access technology into the active state and perform service transmission by using the one or more of the at least one second radio access technology,

wherein the condition that the network states of the one or more of the at least one first radio access technology cannot ensure the service transmission comprises that:

the one or more of the at least one first radio access technology causes a service interruption due to coverage or a failure;

or,

signal quality of the one or more of the at least one first radio access technology is lower than a preset quality threshold value;

or,

the at least one first radio access technology has a Radio Link Failure (RLF);

or,

the at least one first radio access technology has an RLF, and fails in radio link recovery;

or,

the transmission device predicts that the at least one first radio access technology is about to fail.

15. The transmission device according to claim 14, further comprising a sending unit, configured to notify an opposite device of the transmission device of state changes of the one or more of the at least one second radio access technology, wherein

the transmission device is a terminal, and the opposite device is a network device; or,

the transmission device is a network device, and the opposite device is a terminal; or,

the transmission device is a terminal, and the opposite device is another terminal.

16. The transmission device according to claim 15, further comprising a selection unit, configured to select the multiple radio access technologies for the service.