

CLAIMS

What is claimed is:

1. A method for transmitting failure information, applied to a communications device, wherein the method comprises:

5 in a case that failure has occurred on first connection(s) in a dual active protocol stack DAPS mobility procedure, transmitting failure information of at least one of the first connection(s), wherein

10 the first connection(s) comprise at least one of the following: a source connection between a terminal and a source cell and a target connection between the terminal and a target cell.

2. The method according to claim 1, wherein in a case that the first connection(s) are the source connection or the target connection, the failure information satisfies any one of the following:

15 that the failure information comprises first indication information for indicating a connection corresponding to the failure information; and

 that the failure information is transmitted over a target resource, wherein the target resource is a resource corresponding to a second connection, and the second connection is a connection other than the connection corresponding to the failure information in the first connection(s).

20 3. The method according to claim 1, wherein in a case that the first connection(s) comprise the source connection and the target connection and that a connection corresponding to the failure information is the source connection or the target connection, the method further comprises:

25 transmitting second indication information for indicating that the terminal has experienced source connection failure and target connection failure.

~~4. The method according to claim 3, wherein the connection corresponding to the failure information is prescribed by a protocol or configured by a network side device.~~

~~54~~. The method according to claim 1, wherein the failure information comprises third indication information for indicating any one of the following:

that a connection corresponding to the failure information fails before the terminal is connected to the target cell; and

5 that a connection corresponding to the failure information fails after the terminal is connected to the target cell.

~~65~~. The method according to claim 1, wherein in a case that a first condition is satisfied, the failure information comprises at least one of the following: fourth indication information for indicating a failure type of a connection corresponding to the failure information, and measurement information, wherein

that the first condition is satisfied comprises any one of the following:

that the first connection is the source connection or the target connection; and

that the first connection(s) comprise the source connection and the target connection and that a connection corresponding to the failure information is the source connection or the target connection.

~~76~~. The method according to claim ~~65~~, wherein in a case that a second condition is satisfied, the failure type of the connection corresponding to the failure information comprises any one of the following: radio link failure, integrity check failure, radio resource control RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded, wherein

that the second condition is satisfied comprises any one of the following:

that the connection corresponding to the failure information is the source connection; and

that the connection corresponding to the failure information is the target connection and that the connection corresponding to the failure information fails after the terminal is connected to the target cell.

~~87~~. The method according to claim ~~65~~, wherein in a case that the connection corresponding to the failure information is the target connection and that the connection corresponding to the failure information fails before the terminal is connected to the target cell, the failure type of the connection corresponding to the

failure information comprises any one of the following: handover failure, secondary cell group SCG addition failure, radio link failure, integrity check failure, RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded.

5 ~~98.~~ The method according to claim 1, wherein in a case that the first connection(s) comprise the source connection and the target connection and that connections corresponding to the failure information comprise the source connection and the target connection, the failure information comprises at least one of the following:

10 fifth indication information for indicating that the terminal has experienced source connection failure and target connection failure;

 sixth indication information for indicating failure type(s) of at least one of the source connection and the target connection; and

 measurement information.

15 ~~109.~~ The method according to claim ~~98~~, wherein the sixth indication information satisfies any one of the following:

 in a case that the sixth indication information is used to indicate the failure type of the source connection or the target connection, a connection corresponding to the sixth indication information is prescribed by a protocol or configured by a network
20 side device; and

 in a case that the sixth indication information is used to indicate the failure types of the source connection and the target connection, the sixth indication information is further used to indicate a connection corresponding to each failure
 type;

25 ~~or.~~

~~11. The method according to claim 9,~~ wherein the failure type(s) indicated by the sixth indication information satisfy at least one of the following:

 in a case that the connection corresponding to the sixth indication information fails before the terminal is connected to the target cell, the failure type(s) indicated
30 by the sixth indication information comprise at least one of the following: handover

failure, SCG addition failure, radio link failure, integrity check failure, RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded; and

5 in a case that the connection corresponding to the sixth indication information fails after the terminal is connected to the target cell, the failure type(s) indicated by the sixth indication information comprise at least one of the following: radio link failure, integrity check failure, RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded.

10 ~~12~~10. The method according to claim ~~6 or 95~~ or 8, wherein the measurement information comprises at least one of the following: source cell measurement result, target cell measurement result, and neighboring cell measurement result, wherein

the source cell is a primary cell PCell or a secondary cell SCell, and the target cell is a PCell or a SCell.

15 ~~13~~11. The method according to claim 1, further comprising:

transmitting failure timing duration(s) of at least one of the first connection(s) in a case that a third condition is satisfied, wherein a failure timing duration of each connection starts from a first time point to a time point when the connection fails, wherein

that the third condition is satisfied comprises any one of the following:

20 that in a case that N connections of the terminal have failed, the terminal is allowed to report failure timing durations of M of the N connections; and

that in a case that N connections of the terminal have failed, the terminal is allowed to report failure timing duration(s) of connection(s) of a target type in the N connections, and that the first connection(s) comprise connection(s) of the target type, wherein

N is a positive integer, and M is a positive integer less than or equal to N.

25 ~~14~~12. The method according to claim ~~13~~11, wherein connection(s) corresponding to the transmitted failure timing duration(s) satisfy any one of the following:

that in a case that the third condition being satisfied comprises the terminal being allowed to report failure timing durations of M of the N connections, the connection(s) corresponding to the transmitted failure timing duration(s) comprise all of the first connection(s); and

5 that in a case that the third condition being satisfied comprises the terminal being allowed to report failure timing duration(s) of connection(s) of a target type in the N connections and that the first connection(s) comprise connection(s) of the target type, the connection(s) corresponding to the transmitted failure timing duration(s) comprise the connection(s) of the target type in the first connection(s).

10 ~~1513.~~ The method according to claim ~~1311~~, wherein the first time point is any one of the following:

 a time point when the terminal receives a first command, wherein the first command instructs the terminal to perform a DAPS mobility procedure; and

 a time point when the terminal starts to perform a DAPS mobility procedure.

15 ~~16. The method according to claim 1, wherein before the transmitting failure information of at least one of the first connection(s), the method further comprises:~~
 ~~transmitting request information, wherein the request information is used to request the terminal to report the failure information.~~

20 ~~1714.~~ The method according to claim 1, wherein before the transmitting failure information of at least one of the first connection(s), the method further comprises:

 transmitting seventh indication information for indicating that the terminal has stored the failure information.

25 ~~1815.~~ A communications device, comprising:

 a first transmission module, configured to: in a case that failure has occurred on first connection(s) in a dual active protocol stack DAPS mobility procedure, transmit failure information of at least one of the first connection(s), wherein

 the first connection(s) comprise at least one of the following: a source connection between a terminal and a source cell and a target connection between the terminal and a target cell.

~~19~~16. The communications device according to claim ~~18~~15, wherein in a case that the first connection(s) are the source connection or the target connection, the failure information satisfies any one of the following:

that the failure information comprises first indication information for indicating
5 a connection corresponding to the failure information; and

that the failure information is transmitted over a target resource, wherein the target resource is a resource corresponding to a second connection, and the second connection is a connection other than the connection corresponding to the failure information in the first connection(s).

~~20. The communications device according to claim 18, wherein in a case that the first connection(s) comprise the source connection and the target connection and that a connection corresponding to the failure information is the source connection or the target connection, the communications device further comprises:~~

~~a second transmission module, configured to transmit second indication information for indicating that the terminal has experienced source connection failure and target connection failure.~~

~~21. The communications device according to claim 20, wherein the connection corresponding to the failure information is prescribed by a protocol or configured by a network side device.~~

~~22~~17. The communications device according to claim ~~18~~15, wherein the failure information comprises third indication information for indicating any one of the following:

that a connection corresponding to the failure information fails before the terminal is connected to the target cell; and

25 that a connection corresponding to the failure information fails after the terminal is connected to the target cell.

~~23. The communications device according to claim 18, wherein in a case that the first condition is satisfied, the failure information comprises at least one of the following: fourth indication information for indicating a failure type of a connection corresponding to the failure information, and measurement information, wherein~~

~~that the first condition is satisfied comprises any one of the following:~~

~~that the first connection is the source connection or the target connection; and~~

~~that the first connection(s) comprise the source connection and the target connection and that a connection corresponding to the failure information is the source connection or the target connection.~~

~~24. The communications device according to claim 23, wherein in a case that a second condition is satisfied, the failure type of the connection corresponding to the failure information comprises any one of the following: radio link failure, integrity check failure, radio resource control RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded, wherein~~

~~that the second condition is satisfied comprises any one of the following:~~

~~that the connection corresponding to the failure information is the source connection; and~~

~~that the connection corresponding to the failure information is the target connection and that the connection corresponding to the failure information fails after the terminal is connected to the target cell.~~

~~25. The communications device according to claim 23, wherein in a case that the connection corresponding to the failure information is the target connection and that the connection corresponding to the failure information fails before the terminal is connected to the target cell, the failure type of the connection corresponding to the failure information comprises any one of the following: handover failure, secondary cell group SCG addition failure, radio link failure, integrity check failure, RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded.~~

~~26. The communications device according to claim 18, wherein in a case that the first connection(s) comprise the source connection and the target connection and that connections corresponding to the failure information comprise the source connection and the target connection, the failure information comprises at least one of the following:~~

~~fifth indication information for indicating that the terminal has experienced source connection failure and target connection failure;~~

~~sixth indication information for indicating failure type(s) of at least one of the source connection and the target connection; and~~

5 ~~measurement information.~~

~~27. The communications device according to claim 26, wherein the sixth indication information satisfies any one of the following:~~

10 ~~in a case that the sixth indication information is used to indicate the failure type of the source connection or the target connection, a connection corresponding to the sixth indication information is prescribed by a protocol or configured by a network side device; and~~

15 ~~in a case that the sixth indication information is used to indicate the failure types of the source connection and the target connection, the sixth indication information is further used to indicate a connection corresponding to each failure type.~~

~~28. The communications device according to claim 26, wherein the failure type(s) indicated by the sixth indication information satisfy at least one of the following:~~

20 ~~in a case that the connection corresponding to the sixth indication information fails before the terminal is connected to the target cell, the failure type(s) indicated by the sixth indication information comprise at least one of the following: handover failure, SCG addition failure, radio link failure, integrity check failure, RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded; and~~

25 ~~in a case that the connection corresponding to the sixth indication information fails after the terminal is connected to the target cell, the failure type(s) indicated by the sixth indication information comprise at least one of the following: radio link failure, integrity check failure, RRC message reconfiguration failure, and maximum uplink transmission timing difference exceeded.~~

~~29. The communications device according to claim 23 or 26, wherein the measurement information comprises at least one of the following: source cell measurement result, target cell measurement result, and neighboring cell measurement result, wherein~~

5 ~~the source cell is a primary cell PCell or a secondary cell SCell, and the target cell is a PCell or a SCell.~~

~~30~~18. The communications device according to claim ~~18~~15, further comprising:

at a third transmission module, configured to transmit failure timing duration(s) of at least one of the first connection(s) in a case that a third condition is satisfied, wherein a failure timing duration of each connection starts from a first time point to a time point when the connection fails, wherein

that the third condition is satisfied comprises any one of the following:

that in a case that N connections of the terminal have failed, the terminal is allowed to report failure timing durations of M of the N connections; and

15 that in a case that N connections of the terminal have failed, the terminal is allowed to report failure timing duration(s) of connection(s) of a target type in the N connections, and that the first connection(s) comprise connection(s) of the target type, wherein N is a positive integer, and M is a positive integer less than or equal to N.

20 ~~31~~19. The communications device according to claim ~~30~~18, wherein connection(s) corresponding to the transmitted failure timing duration(s) satisfy any one of the following:

that in a case that the third condition being satisfied comprises the terminal being allowed to report failure timing durations of M of the N connections, the connection(s) corresponding to the transmitted failure timing duration(s) comprise all of the first connection(s); and

that in a case that the third condition being satisfied comprises the terminal being allowed to report failure timing duration(s) of connection(s) of a target type in the N connections and that the first connection(s) comprise connection(s) of the

target type, the connection(s) corresponding to the transmitted failure timing duration(s) comprise the connection(s) of the target type in the first connection(s);

or,

~~32. The communications device according to claim 30, wherein the first time point is any one of the following:~~

a time point when the terminal receives a first command, wherein the first command instructs the terminal to perform a DAPS mobility procedure; and

a time point when the terminal starts to perform a DAPS mobility procedure.

~~33. The communications device according to claim 18, wherein before the transmitting failure information of at least one of the first connection(s), the communications device further comprises:~~

~~a fourth transmission module, configured to transmit request information, wherein the request information is used to request the terminal to report the failure information.~~

~~34. The communications device according to claim 18, wherein before the transmitting failure information of at least one of the first connection(s), the communications device further comprises:~~

~~a fifth transmission module, configured to transmit seventh indication information for indicating that the terminal has stored the failure information.~~

~~35. A communications device, comprising a processor, a memory, and a computer program stored in the memory and capable of running on the processor, wherein when the computer program is executed by the processor, the steps of the method for transmitting failure information according to any one of claims 1 to 17 are implemented.~~

~~36~~20. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program, and when the computer program is executed by a processor, the steps of the method for transmitting failure information according to any one of claims 1 to ~~17~~14 are implemented.