CELL RESELECTION METHOD, CELL RESELECTION APPARATUS, AND STORAGE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is the national phase of International Application No. PCT/CN2020/093515, filed on May 29, 2020, the content of which is hereby incorporated by reference.

TECHNICAL FIELD

~~**[0001]**~~**[0002]** The disclosure relates to the field of communication technologies, and in particular to, a method and a device for cell reselection, and a storage medium.

BACKGROUND

~~**[0002]**~~**[0003]** In the related art, a terminal reselects a cell for a terrestrial network based on S-criteria and R-criteria.

~~**[0003]**~~**[0004]** With the development of fifth generation (5G) networks, a non-terrestrial network (NTN) has been introduced. For the NTN network, a cell radius is larger and a difference of reference signal received powers (RSRPs) or reference signal received qualities (RSRQ) when the terminal is at a center or edge of the cell is small; and since the cell radius is larger, an overlapping area of cells is relatively large. ~~Therefore, when the terminal moves and causes channel fading (such as occlusion), cell reselection based on S-criteria and R-criteria may cause the terminal to perform the cell reselection in two cells back and forth, and if the cell reselection is performed based on S-criteria and R-criteria, it is difficult to configure reasonable cell reselection parameters.~~

~~**[0004]** Therefore, how to provide a method for cell reselection for the NTN network is a problem that needs to be solved urgently.~~

SUMMARY

[0005] To overcome problems in the related art, the disclosure provides a method and a device for cell reselection, and a storage medium.

[0006] According to a first aspect of embodiments of the disclosure, a method for cell reselection is provided, which includes: obtaining a reference distance of a cell and determining an actual distance between a terminal and a center of the cell; and performing cell reselection based on the reference distance and the actual distance.

[0007] In an implementation manner, the cell includes a serving cell of the terminal and

disclosure. Instead, they are merely examples of apparatuses and methods consistent with aspects related to the disclosure as recited in the appended claims.

[0049] The information sending method provided in embodiments of the disclosure can be applicable to a wireless communication system in FIG. 1. Referring to FIG. 1, the wireless communication system includes a terminal 10 and a network device 20. Information is sent and received between the terminal 10 and the network device 20 through wireless resources.

[0050] It can be understood that the wireless communication system in FIG. 1 is only for schematic illustration. The wireless communication system may also include other network devices, such as a core network device, a wireless relay device, and a wireless backhaul device, which are not illustrated in FIG. 1. Embodiments of the disclosure do not limit the number of network devices and the number of terminals included in the wireless communication system.

[0051] It can be further understood that the wireless communication system in embodiments of the disclosure is a network that provides wireless communication functions. The wireless communication system can use different communication technologies, such as code division multiple access (CDMA), wideband code division multiple access (WCDMA), time division multiple access (TDMA), frequency division multiple access (FDMA), orthogonal frequency-division multiple access (OFDMA), single carrier FDMA (SC-FDMA), or carrier sense multiple access with collision avoidance. According to different network capacities, speeds, delays and other factors, the network can be divided into a second generation (2G) network, a third generation (3G) network, a fourth generation (4G) network, or a future evolution network such as a 5G network. The 5G network can also be called a new radio (NR) network. For the convenience of description, the wireless communication network is sometimes referred to as a network for short in this disclosure.

[0052] Further, the network device involved in the disclosure may also be referred to as a wireless access network device. The wireless access network device may be a base station, an evolved base station (evolved node B), a home base station, an access point (AP) in a wireless fidelity (WIFI) system, a wireless relay node, a wireless backhaul node, a transmission point (TP), a transmission and reception point (TRP), a gNB in an NR system, or a component or part of a device constituting the base station. When it is a vehicle-to-vehicle (V2X) communication system, the network device may also be a vehicle-mounted device. In

hardware structures and/or software modules for implements various functions. In combination with units and algorithm steps of examples disclosed in embodiments of the disclosure, embodiments of the disclosure can be implemented in the form of hardware or a combination of hardware and computer software. Whether a certain function is executed by hardware or computer software-driven hardware depends on the specific application and design constraint conditions of technical solutions. Those skilled in the art can use different manners for each specific application to implement the described functions, and such implementation should not be considered as going beyond the scope of technical solutions of embodiments of the disclosure.

[00101] FIG. 6 is a block diagram illustrating an apparatus for cell reselection, according to some embodiments. Referring to FIG. 6, the apparatus 100 for cell reselection includes an obtaining unit 101 and a processing unit 102. The obtaining unit 101 is configured to obtain a reference distance of a cell and determine an actual distance between a terminal and a center of the cell. The processing unit 102 is configured to perform cell reselection based on the reference distance and the actual distance.

[00102] In an implementation manner, the cell includes a serving cell of the terminal and the processing unit 102 is further configured to: in response to a cell selection receive level value being greater than a cell selection receive level threshold for intra-frequency measurements~~reference signal received power threshold for intra-frequency measurements~~, a cell selection quality value being greater than a cell selection quality threshold for intra-frequency measurements~~reference signal received quality threshold for intra-frequency measurements~~, and the reference distance of the serving cell being greater than the actual distance between the terminal and the center of the serving cell, not measure intra-frequency neighboring cells. This is presented as Srxlev>SIntraSearchP and Squal>SIntraSearchQ, where Srxlev is the cell selection receive level value, SIntraSearchP is the cell selection receive level threshold for intra-frequency measurements, Squal is the cell selection quality value, and SIntraSearchQ is the cell selection quality threshold for intra-frequency measurements.

[00103] In another implementation manner, a target cell obtained by performing the cell reselection based on the reference distance and the actual distance satisfies: a cell selection receive level value of the target cell being greater than 0, a cell selection quality value of the target cell being greater than 0, and the reference distance of the target cell being greater than the actual distance between the terminal and the center of the target cell.

[00104] In another implementation manner, the processing unit 102 is configured to perform the cell reselection based on the reference distance and the actual distance by: determining R values of a plurality of cells based on R-criteria for cell reselection, in which

CLAIMS

1. A method for cell reselection, performed by a terminal, comprising:

obtaining a ~~reference distance~~reference distance threshold of a cell and determining an actual distance between ~~a~~ the terminal and a center of the cell; and

performing cell reselection based on the ~~reference distance~~reference distance threshold and the actual distance.

2. The method as claimed in claim 1, wherein the cell comprises a serving cell of the terminal and the method further comprises:

in response to a cell selection receive level value being greater than a cell selection receive level~~reference signal received power~~ threshold for intra-frequency measurements, a cell selection quality value being greater than a cell selection quality~~reference signal received quality~~ threshold for intra-frequency measurements, and the ~~reference distance~~reference distance threshold of the serving cell being greater than the actual distance between the terminal and the center of the serving cell, not measuring intra-frequency neighboring cells.

3. The method as claimed in claim 1, wherein a target cell obtained by performing the cell reselection based on the ~~reference distance~~reference distance threshold and the actual distance satisfies: a cell selection receive level value of the target cell being greater than 0, a cell selection quality value of the target cell being greater than 0, and the ~~reference distance~~reference distance threshold of the target cell being greater than the actual distance between the terminal and the center of the target cell.

4. The method as claimed in claim 1 or 3, wherein performing the cell reselection based on the ~~reference distance~~reference distance threshold and the actual distance comprises:

determining (S31) R values of a plurality of cells based on R-criteria for cell reselection, wherein the plurality of cells comprise neighboring cells and a serving cell;

in response to there being neighboring cells with the R values higher than the R value of the serving cell and satisfying S-criteria for cell reselection, selecting a neighboring cell with the ~~reference distance~~reference distance threshold greater than or equal to the actual distance from the neighboring cells with the R values higher than the R value of the serving cell;

in response to neighboring cells with the ~~reference distance~~reference distance thresholds greater than or equal to the actual distances existing in the neighboring cells with the R values

higher than the R value of the serving cell, selecting a neighboring cell with a largest R value among the neighboring cells with the ~~reference distance~~reference distance thresholds greater than or equal to the actual distances as a reselected cell; and

in response to no neighboring cell with the ~~reference distance~~reference distance threshold greater than or equal to the actual distance existing in the neighboring cells with the R values higher than the R value of the serving cell, performing the cell reselection based on the ~~reference distance~~reference distance threshold of the serving cell and the actual distance between the terminal and the center of the serving cell.

5. The method as claimed in claim 4, wherein performing the cell reselection based on the ~~reference distance~~reference distance threshold of the serving cell and the actual distance between the terminal and the center of the serving cell comprises:

in response to the ~~reference distance~~reference distance threshold of the serving cell being greater than or equal to the actual distance between the terminal and the center of the serving cell, residing in the serving cell; and

in response to the ~~reference distance~~reference distance threshold of the serving cell being less than the actual distance between the terminal and the center of the serving cell, selecting a neighboring cell with a largest R value among the neighboring cells with the R values higher than the R value of the serving cell as the reselected cell.

6. The method as claimed in claim 1 or 3, wherein performing the cell reselection based on the ~~reference distance~~reference distance threshold and the actual distance comprises:

selecting cells that satisfy conditions of cell selection receive level values being greater than 0, cell selection quality values being greater than 0, and ~~reference distance~~reference distance thresholds being greater than actual distances;

determining R values of a plurality of cells in the selected cells based on R-criteria for cell reselection; and

in response to there being neighboring cells with the determined R values higher than the R value of the serving cell, selecting a neighboring cell with a largest R value among the neighboring cells with the determined R values higher than the R value of the serving cell as a reselected cell.

7. The method as claimed in any one of claims 1 to 6, wherein determining the actual

distance between the terminal and the center of the cell comprises:

determining location information of the terminal and obtaining ~~cell location information~~cell reference location information provided by a network device; and

determining the actual distance between the terminal and the center of the cell based on the location information of the terminal and the ~~cell location information~~cell reference location information.

8. The method as claimed in any one of claims 1 to 7, wherein determining the actual distance between the terminal and the center of the cell comprises:

determining location information of the terminal and sending the location information to a network device; and

obtaining the actual distance between the terminal and the center of the cell, determined by the network device based on the location information of the terminal and ~~cell location information~~cell reference location information.

9. The method as claimed in any one of claims 1 to 8, wherein obtaining the ~~reference distance~~reference distance threshold of the cell comprises:

obtaining the ~~reference distance~~reference distance threshold of the cell based on a broadcasted system ~~broadcast~~ message of at least one of a serving cell ~~and/~~or a neighboring cell.

10. A method for cell reselection, performed by a network device, comprising:

sending a ~~reference distance~~reference distance threshold of a cell, wherein the ~~reference distance~~reference distance threshold is configured for a terminal to perform cell reselection based on the ~~reference distance~~reference distance threshold and an actual distance between the terminal and a center of the cell.

11. The method as claimed in claim 10, further comprising:

sending ~~cell location information~~cell reference location information, wherein the ~~cell location information~~cell reference location information is configured for the terminal to determine the actual distance.

12. The method as claimed in claim 10, further comprising:

obtaining location information of the terminal;

determining the actual distance between the terminal and the center of the cell based on the location information of the terminal and ~~cell location information~~cell reference location information; and

sending the actual distance to the terminal.

13. The method as claimed in any one of claims 10 to 12, wherein a target cell obtained by performing the cell reselection by the terminal based on the ~~reference distance~~reference distance threshold and the actual distance satisfies: a cell selection receive level value of the target cell being greater than 0, a cell selection quality value of the target cell being greater than 0, and the ~~reference distance~~reference distance threshold of the target cell being greater than the actual distance between the terminal and the center of the target cell.

14. An apparatus for cell reselection, comprising:

an obtaining unit, configured to obtain a reference distance threshold of a cell and determine an actual distance between a terminal and a center of the cell; and

a processing unit, configured to perform cell reselection based on the reference distance threshold and the actual distance.

~~15. The apparatus as claimed in claim 14, wherein the cell comprises a serving cell of the terminal and the processing unit is further configured to:~~

~~in response to a cell selection receive level value being greater than a reference signal received power threshold for intra-frequency measurements, a cell selection quality value being greater than a reference signal received quality threshold for intra-frequency measurements, and the reference distance of the serving cell being greater than the actual distance between the terminal and the center of the serving cell, not measure intra-frequency neighboring cells.~~

~~16~~15. The apparatus as claimed in claim 14, wherein a target cell obtained by performing the cell reselection based on the reference distance threshold and the actual distance satisfies: a cell selection receive level value of the target cell being greater than 0, a cell selection quality value of the target cell being greater than 0, and the reference distance threshold of the target cell being greater than the actual distance between the terminal and the center of the target cell.

17. The apparatus as claimed in claim 14 or 16, wherein the processing unit is configured to perform the cell reselection based on the reference distance and the actual distance by:

determining R values of a plurality of cells based on R-criteria for cell reselection, wherein the plurality of cells comprise neighboring cells and a serving cell;

in response to there being neighboring cells with the R values higher than the R value of the serving cell and satisfying S-criteria for cell reselection, selecting a neighboring cell with the reference distance greater than or equal to the actual distance from the neighboring cells with the R values higher than the R value of the serving cell;

in response to neighboring cells with the reference distances greater than or equal to the actual distances existing in the neighboring cells with the R values higher than the R value of the serving cell, selecting a neighboring cell with a largest R value among the neighboring cells with the reference distances greater than or equal to the actual distances as a reselected cell; and

in response to no neighboring cell with the reference distance greater than or equal to the actual distance existing in the neighboring cells with the R values higher than the R value of the serving cell, performing the cell reselection based on the reference distance of the serving cell and the actual distance between the terminal and the center of the serving cell.

18. The apparatus as claimed in claim 17, wherein the processing unit is configured to perform the cell reselection based on the reference distance of the serving cell and the actual distance between the terminal and the center of the serving cell by:

in response to the reference distance of the serving cell being greater than or equal to the actual distance between the terminal and the center of the serving cell, residing in the serving cell; and

in response to the reference distance of the serving cell being less than the actual distance between the terminal and the center of the serving cell, selecting a neighboring cell with a largest R value among the neighboring cells with the R values higher than the R value of the serving cell as the reselected cell.

19. The apparatus as claimed in claim 14 or 16, wherein the processing unit is configured to perform the cell reselection based on the reference distance and the actual distance by:

selecting cells that satisfy conditions of cell selection receive level values being greater than 0, cell selection quality values being greater than 0, and reference distances being greater

~~than actual distances;~~

~~determining R values of a plurality of cells in the selected cells based on R-criteria for cell reselection; and~~

~~in response to there being neighboring cells with the determined R values higher than the R value of the serving cell, selecting a neighboring cell with a largest R value among the neighboring cells with the determined R values higher than the R value of the serving cell as a reselected cell.~~

~~20. The apparatus as claimed in claim 14, wherein the obtaining unit is configured to determine the actual distance between the terminal and the center of the cell by:~~

~~determining location information of the terminal and obtaining cell location information provided by a network device; and~~

~~determining the actual distance between the terminal and the center of the cell based on the location information of the terminal and the cell location information.~~

~~21. The apparatus as claimed in claim 14, wherein the obtaining unit is configured to determine the actual distance between the terminal and the center of the cell by:~~

~~determining location information of the terminal and sending the location information to a network device; and~~

~~obtaining the actual distance between the terminal and the center of the cell, determined by the network device based on the location information of the terminal and cell location information.~~

~~22. The apparatus as claimed in claim 14, wherein the obtaining unit is configured to obtain the reference distance of the cell by:~~

~~obtaining the reference distance of the cell based on a system broadcast message of a serving cell and/or a neighboring cell.~~

~~23~~16. An apparatus for cell reselection, comprising:

a sending unit, configured to send a reference distance threshold of a cell, wherein the reference distance threshold is configured for a terminal to perform cell reselection based on the reference distance threshold and an actual distance between the terminal and a center of the cell.

~~24. The apparatus as claimed in claim 23, wherein the sending unit is further configured to:~~

~~send cell location information, wherein the cell location information is configured for the terminal to determine the actual distance.~~

~~25. The apparatus as claimed in claim 23, further comprising:~~

~~an obtaining unit, configured to obtain location information of the terminal; and~~

~~a processing unit, configured to determine the actual distance between the terminal and the center of the cell based on the location information of the terminal and cell location information,~~

~~wherein the sending unit is further configured to send the actual distance to the terminal.~~

~~26. The apparatus as claimed in any one of claims 23 to 25, wherein a target cell obtained by performing the cell reselection by the terminal based on the reference distance and the actual distance satisfies: a cell selection receive level value of the target cell being greater than 0, a cell selection quality value of the target cell being greater than 0, and the reference distance of the target cell being greater than the actual distance between the terminal and the center of the target cell.~~

~~27~~17. A device for cell reselection, comprising:

a processor; and

a memory for storing instructions executable by the processor,

wherein, the processor is configured to perform the method as claimed in any one of claims 1-9.

~~28~~18. A device for cell reselection, comprising:

a processor; and

a memory for storing instructions executable by the processor,

wherein, the processor is configured to perform the method as claimed in any one of claims 10-13.

~~29~~19. A non-transitory computer-readable storage medium having stored therein

instructions that, when executed by a processor of a mobile terminal, cause the mobile terminal to perform the method as claimed in any one of claims 1-9.

~~30~~20. A non-transitory computer-readable storage medium having stored therein instructions that, when executed by a processor of a network device, cause the network device to perform the method as claimed in any one of claims 10-13.