

CLAIMS

What is claimed is:

1. A method for determining a random-access resource, which is performed by a first communication node, the method comprising:

5 determining at least one coverage enhancement level for at least one carrier of the first communication node, with each of the at least one coverage enhancement level corresponding to a respective one of the at least one carrier;

 determining a target coverage enhancement level based on the determined at least one coverage enhancement level;

10 selecting a carrier from the at least one carrier according to the target coverage enhancement level; and

 selecting the random-access resource on the selected carrier based on the coverage enhancement level of the selected carrier;

 wherein,

15 the at least one carrier comprises one anchor carrier and at least one non-anchor carrier, and determining the at least one coverage enhancement level for the at least one carrier comprises:

 determining the coverage enhancement level of the at least one non-anchor carrier according to a Reference Signal Receiving Power (RSRP) value of the anchor carrier and
20 second RSRP thresholds of the coverage enhancement levels; wherein,

 the second RSRP thresholds comprise a threshold of the first coverage enhancement level, a threshold of the second coverage enhancement level, and a plurality of thresholds of the third coverage enhancement level; the level value of the third coverage enhancement level is lower than the level value of the first coverage enhancement level which is in turn lower than the level
25 value of the second coverage enhancement level; each of the at least one non-anchor carrier corresponds to a respective one of the plurality of thresholds of the third coverage enhancement level; or, each of the at least one non-anchor carrier corresponds to a same one of the plurality of thresholds of the third coverage enhancement level; each of the plurality of thresholds of the third coverage enhancement level is lower than the threshold of the first coverage enhancement
30 level which is in turn lower than the threshold of the second coverage enhancement level; and
 wherein

 in response to: a determination of the coverage enhancement level of a respective non-

anchor carrier of the at least one non-anchor carrier being a non-third coverage enhancement level based on the respective one of the plurality of thresholds of the third coverage enhancement level corresponding to the respective non-anchor carrier, and the determination of the coverage enhancement level of the respective non-anchor carrier to be a third coverage enhancement level based on the threshold of the first coverage enhancement level, adjusting the coverage enhancement level of the respective non-anchor carrier.

2. The method according to claim 1, wherein determining the at least one coverage enhancement level for the at least one carrier comprises:

determining the coverage enhancement level for the at least one carrier according to the RSRP value of the anchor carrier and first RSRP thresholds for coverage enhancement levels; wherein,

the first RSRP thresholds comprise a threshold of a first coverage enhancement level and a threshold of a second coverage enhancement level; and the threshold of the first coverage enhancement level is greater than the threshold of the second coverage enhancement level.

3. The method according to claim 2, wherein the at least one carrier comprises one anchor carrier, and at least one non-anchor carrier each having an identical or different narrowband reference signal (NRS) power offset from one another, with respect to an NRS power of the anchor carrier; and

the RSRP value of each of the at least one non-anchor carrier is determined according to the RSRP value of the anchor carrier and the NRS power offset of the respective one of the at least one non-anchor carrier with respect to the NRS power of the anchor carrier.

4. The method according to claim 1, wherein the at least one carrier comprises one anchor carrier, and at least one non-anchor carrier, determining at least one coverage enhancement level for at least one carrier comprises, determining a plurality of coverage enhancement levels for the anchor carrier and the at least one non-anchor carrier;

and selecting the carrier from the at least one carrier according to the target coverage enhancement level comprises:

forming a set of carriers each configured with random access resources corresponding to the target coverage enhancement level, from the at least one carrier, and selecting the carrier from the set of carriers; wherein the target coverage enhancement level is the coverage enhancement level of the anchor carrier or a lowest coverage enhancement level among the plurality of coverage enhancement levels.

5. The method according to claim 1, wherein adjusting the coverage enhancement level of the one of the at least one non-anchor carrier comprises:

adjusting the coverage enhancement level of the one of the at least one non-anchor carrier to be the first coverage enhancement level.

6. The method according to claim 5, wherein adjusting the coverage enhancement level of the one of the at least one non-anchor carriers comprises:

increasing the coverage enhancement level of the one of the at least one non-anchor carrier by a preset number of levels; or, adjusting the coverage enhancement level of the one of the at least one non-anchor carrier to the maximum coverage enhancement level of the random-access resource configured by a cell.

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

in response to the number of times of attempts for random access based on the selected random-access resource being greater than or equal to a preset threshold, select the random-access resource on the carrier with the largest coverage enhancement level; or, after adjusting the coverage enhancement level of each carrier, continue the carrier selection.

8. A method for determining a random-access resource, which is performed by a first communication node, the method comprising:

determining at least one coverage enhancement level for at least one carrier of the first communication node, with each of the at least one coverage enhancement level corresponding to a respective one of the at least one carrier;

determining a target coverage enhancement level based on the determined at least one coverage enhancement level;

selecting a carrier from the at least one carrier according to the target coverage enhancement level; and

selecting the random-access resource on the selected carrier based on the coverage enhancement level of the selected carrier;

wherein the at least one carrier comprises one anchor carrier and at least one non-anchor carrier, and determining the at least one coverage enhancement level for the at least one carrier comprises:

determining the coverage enhancement level of one of the at least one non-anchor carrier according to a Reference Signal Receiving Power (RSRP) value of the anchor carrier and a third RSRP threshold of the coverage enhancement level; wherein,

the third RSRP threshold comprises a threshold of a first coverage enhancement level, a

threshold of a second coverage enhancement level and a threshold of an uplink coverage decision; the threshold of the uplink coverage decision is utilized to determine the coverage enhancement level of the one of the at least one non-anchor carrier; and the threshold of the uplink coverage decision is lower than the threshold of the first coverage enhancement level which is in turn lower than the threshold of the second coverage enhancement level; and wherein,

in response to: a determination of the coverage enhancement level of the one of the at least one non-anchor carrier being a non-third coverage enhancement level based on the threshold of the uplink coverage decision, and a further determination of the coverage enhancement level of the one of the at least one non-anchor carrier to be a third coverage enhancement level based on the threshold of the first coverage enhancement level, wherein the level value of the third coverage enhancement level is lower than the level value of the first coverage enhancement level which is in turn lower than the level value of the second coverage enhancement level, adjusting the coverage enhancement level of the one of the at least one non-anchor carrier.

9. The method according to claim 8, wherein adjusting the coverage enhancement level of the one of the at least one non-anchor carrier comprises:

adjusting the coverage enhancement level of the one of the at least one non-anchor carrier to be the first coverage enhancement level.

10. The method according to claim 9, wherein adjusting the coverage enhancement level of the one of the at least one non-anchor carriers comprises:

increasing the coverage enhancement level of the one of the at least one non-anchor carrier by a preset number of levels; or, adjusting the coverage enhancement level of the one of the at least one non-anchor carrier to the maximum coverage enhancement level of the random-access resource configured by a cell.

11. The method according to any one of claims 8 to 10, further comprising:

in response to the number of times of attempts for random access based on the selected random-access resource being greater than or equal to a preset threshold, select the random-access resource on the carrier with the largest coverage enhancement level; or, after adjusting the coverage enhancement level of each carrier, continue the carrier selection.

12. A first communication node, comprising:

at least one processor; and

a storage device configured to store at least one program which,

when executed by the at least one processor, causes the at least one processor to carry out the method according to any one of claims 1 to 11.

13. A storage medium storing at least one computer program which, when executed by a processor, causes the processor to carry out the method according to any one of claims 1 to 11.