CLAIMS

What is claimed is:

1. A method for determining a random access resource configuration, performed by a user equipment (UE), comprising:

obtaining at least one of a first random access resource configuration or a second random access resource configuration sent by a network device; wherein the first random access resource configuration and the second random access resource configuration each comprise at least one random access resource configuration; and each random access resource configuration in the second random access resource configuration corresponds to at least one specific function; and

in response to the UE triggering a random access process, determining a random access resource configuration from the at least one of the first random access resource configuration or the second random access resource configuration based on a usage rule for random access resource configurations and a specific function corresponding to the random access process, and performing random access based on the random access resource configuration;

wherein the specific function comprises any one of or any combination of:

a reduced capability (RedCap) function;

a small data transmission (SDT) function;

a coverage enhancement (CovEnh) function; or

a slicing function.

2. The method of claim 1, wherein the first random access resource configuration comprises at least one of:

a contention-based random access resource configuration;

a contention-free random access resource configuration; or

a system information-request random access resource configuration;

or

wherein the second random access resource configuration comprises a contention-based random access resource configuration.

3. The method of claim 2, wherein the usage rule for random access resource configurations is determined by:

determining a first usage rule for random access resource configurations in response to the UE triggering a contention-free random access process.

4. The method of claim 3, wherein the first usage rule comprises at least one of:

a rule 1: determining the random access resource configuration based on the contention-free random access resource configuration in the first random access resource configuration;

a rule 2: determining the random access resource configuration based on at least one of: the contention-free random access resource configuration in the first random access resource configuration, or a portion of the contention-based random access resource configuration in the first random access resource configuration;

a rule 3: determining the random access resource configuration based on at least one of: all of random access resource configurations in the first random access resource configuration or all of random access resource configurations in the second random access resource configuration;

a rule 4: determining the random access resource configuration based on at least one of: the contention-free random access resource configuration in the first random access resource configuration, a portion of the contention-based random access resource configuration in the first random access resource configuration, or a random access resource configuration corresponding to a first specific function in the second random access resource configuration; or

a rule 5: determining the random access resource configuration based on at least one of: the contention-free random access resource configuration in the first random access resource configuration, or a random access resource configuration corresponding to a first specific function in the second random access resource configuration.

5. The method of claim 2, wherein the usage rule for determining the random access resource configurations is determined by:

determining a second usage rule for random access resource configurations in response to the UE triggering a contention-based random access process.

6. The method of claim 5, wherein the second usage rule comprises at least one of:

a rule 6: determining the random access resource configuration based on all of random access resource configurations in the first random access resource configuration in response to the contention-based random access process being triggered by a function other than the specific function;

a rule 7: determining the random access resource configuration based on at least one of: all of random access resource configurations in the first random access resource configuration or a random access resource configuration corresponding to a first specific function in the second random access resource configuration in response to the contention-based random access process being triggered by a function other than the specific function;

a rule 8: determining the random access resource configuration based on a random access resource configuration corresponding to a second specific function in the second random access resource configuration in response to the contention-based random access process being triggered by a specific function, wherein the second specific function is the specific function that triggers the contention-based random access process; or

a rule 9: determining the random access resource configuration based on at least one of: a random access resource configuration corresponding to a second specific function in the second random access resource configuration or at least a portion of random access resource configurations in the first random access resource configuration in response to the contention-based random access process being triggered by a specific function, wherein the second specific function is the specific function that triggers the contention-based random access process.

7. The method of any one of claims 2-6, wherein the contention-based random access resource configuration comprises at least one of:

a contention-based two-step random access resource configuration; or

a contention-based four-step random access resource configuration;

or

wherein the contention-free random access resource configuration comprises at least one of:

a contention-free two-step random access resource configuration; or

a contention-free four-step random access resource configuration.

8. A method for determining a random access resource configuration, performed by a network device, comprising:

sending at least one of a first random access resource configuration or a second random access resource configuration to the UE; wherein the first random access resource configuration and the second random access resource configuration each comprise at least one random access resource configuration; and each random access resource configuration in the second random access resource configuration corresponds to at least one specific function; and

in response to a user equipment (UE) triggering a random access process, determining a random access resource configuration from the at least one of the first random access resource configuration or the second random access resource configuration based on a usage rule for random access resource configurations and a specific function corresponding to the random access process, and performing random access based on the random access resource configuration;

wherein the specific function comprises any one of or any combination of:

a reduced capability (RedCap) function;

a small data transmission (SDT) function;

a coverage enhancement (CovEnh) function; or

a slicing function.

9. The method of claim 8, wherein the first random access resource configuration comprises at least one of:

a contention-based random access resource configuration;

a contention-free random access resource configuration; or

a system information-request random access resource configuration;

or

wherein the second random access resource configuration comprises a contention-based random access resource configuration.

10. The method of claim 9, wherein the usage rule for random access resource configurations is determined by:

determining a first usage rule for random access resource configurations in response to the UE triggering a contention-free random access process.

11. The method of claim 10, wherein the first usage rule comprises at least one of:

a rule 1: determining the random access resource configuration based on the contention-free random access resource configuration in the first random access resource configuration;

a rule 2: determining the random access resource configuration based on at least one of: the contention-free random access resource configuration in the first random access resource configuration, or a portion of the contention-based random access resource configuration in the first random access resource configuration;

a rule 3: determining the random access resource configuration based on at least one of: all of random access resource configurations in the first random access resource configuration or all of random access resource configurations in the second random access resource configuration;

a rule 4: determining the random access resource configuration based on at least one of: the contention-free random access resource configuration in the first random access resource configuration, a portion of the contention-based random access resource configuration in the first random access resource configuration, or a random access resource configuration corresponding to a first specific function in the second random access resource configuration; or

a rule 5: determining the random access resource configuration based on at least one of: the

contention-free random access resource configuration in the first random access resource configuration, or a random access resource configuration corresponding to a first specific function in the second random access resource configuration.

12. The method of claim 9, wherein the usage rule for random access resource configurations is determined by:

determining a second usage rule for random access resource configurations in response to the UE triggering a contention-based random access process.

13. The method of claim 12, wherein the second usage rule comprises at least one of:

a rule 6: determining the random access resource configuration based on all of random access resource configurations in the first random access resource configuration in response to the contention-based random access process being triggered by a function other than the specific function;

a rule 7: determining the random access resource configuration based on at least one of: all of random access resource configurations in the first random access resource configuration or a random access resource configuration corresponding to a first specific function in the second random access resource configuration in response to the contention-based random access process being triggered by a function other than the specific function;

a rule 8: determining the random access resource configuration based on a random access resource configuration corresponding to a second specific function in the second random access resource configuration in response to the contention-based random access process being triggered by a specific function, wherein the second specific function is the specific function that triggers the contention-based random access process; or

a rule 9: determining the random access resource configuration based on at least one of: a random access resource configuration corresponding to a second specific function in the second random access resource configuration or at least a portion of random access resource configurations in the first random access resource configuration in response to the contention-based random access process being triggered by a specific function, wherein the second specific function is the specific function that triggers the contention-based random access process.

14. The method of any one of claims 9-13, wherein the contention-based random access resource configuration comprises at least one of:

a contention-based two-step random access resource configuration; or

a contention-based four-step random access resource configuration;

or

wherein the contention-free random access resource configuration comprises at least one of:

a contention-free two-step random access resource configuration; or

a contention-free four-step random access resource configuration.

15. A communication device, comprising:

a processor; and

a memory having a computer program stored thereon,

wherein the processor is configured to execute the computer program to cause the communication device to perform the method of any of claims 1 to 7 or the method of any of claims 9 to 14.

16. A computer-readable storage medium having instructions stored thereon, wherein when the instructions are executed, the method of any of claims 1 to 7 or the method of any of claims 9 to 14 is performed.