

WHAT IS CLAIMED IS:

1. A user equipment comprising:

means for determining that a plurality of resources for a two-step contention-free random access have been configured for the user equipment by a network device, wherein
5 the plurality of resources comprises a preamble and a time frequency resource for a payload of the two-step contention-free random access, wherein the time frequency resource comprises a Physical Uplink Shared Channel, PUSCH, resource,

means for selecting, for a contention-based random access message, a preamble group of a plurality of preamble groups configured for the user equipment, in a case that the plurality
10 of resources for the two-step contention-free random access have been configured, wherein the means for selecting is configured to select the preamble group, for the contention-based random access message, based on whether a first transport block size indicating a size of the payload that can be transmitted using the time frequency resource for the two-step contention-free random access corresponds to a second transport block size configured for
15 the preamble group configured for the user equipment, and

means for transmitting the contention-based random access message to the network device using a preamble from the preamble group.

2. The user equipment according to claim 1, wherein the contention-based random access message is Msg1 of a four-step random access procedure or MsgA of a two-step
20 random access procedure.

3. The user equipment according to claim 1 or claim 2,

wherein the plurality of preamble groups includes at least a preamble group A and a preamble group B, and

wherein the means for selecting is configured to select the preamble group B if the first
25 transport block size corresponds to the second transport block size.

4. The user equipment according to claim 3, wherein in a case of switching from the two-step contention-free random access to four-step contention-based random access, the means for selecting is configured to select the preamble group B if the first transport block

size corresponds to the second transport block size.

5. The user equipment according to claim 3,

wherein the means for selecting is configured to select the preamble group A if the first transport block size does not correspond to the second transport block size.

5 6. The user equipment according to claim 5, wherein in a case of switching from the two-step contention-free random access to four-step contention-based random access, the means for selecting is configured to select the preamble group A if the first transport block size does not correspond to the second transport block size.

7. A method performed by a user equipment, the method comprising:

10 determining that a plurality of resources for a two-step contention-free random access has been configured for the user equipment by a network device, wherein the plurality of resources comprises a preamble and a time frequency resource for a payload of the two-step contention-free random access, wherein the time frequency resource comprises a Physical Uplink Shared Channel, PUSCH, resource;

15 selecting, for a contention-based random access message, a preamble group of a plurality of preamble groups configured for the user equipment, in a case that the plurality of resources for the two-step contention-free random access have been configured, wherein the selecting the preamble group, for the contention-based random access message, is based on whether a first transport block size indicating a size of the payload that can be transmitted
20 using the time frequency resource for the two-step contention-free random access corresponds to a second transport block size configured for the preamble group configured for the user equipment; and

transmitting the contention-based random access message to the network device using a preamble from the preamble group.

25 8. The method according to claim 7, wherein the contention-based random access message is Msg1 of a four-step random access procedure or MsgA of a two-step random access procedure.

9. The method according to claim 7 or claim 8,

wherein the plurality of preamble groups includes at least a preamble group A and a preamble group B, and

wherein the method comprises selecting the preamble group B if the first transport block size corresponds to the second transport block size.

5 10. A network device comprising:

means for configuring, for a user equipment, a plurality of resources for a two-step contention-free random access, wherein the plurality of resources comprises a preamble and a time frequency resource for a payload of the two-step contention-free random access, wherein the time frequency resource comprises a Physical Uplink Shared Channel, PUSCH,
10 resource, and

means for receiving, from the user equipment, in a case that the plurality of resources for the two-step contention-free random access have been configured for the user equipment, a contention-based random access message using a preamble from a preamble group selected, from a plurality of preamble groups configured for the user equipment, based on whether a
15 first transport block size indicating a size of the payload that can be transmitted using the time frequency resource for the two-step contention-free random access corresponds to a second transport block size configured for the preamble group configured for the user equipment.

11. A method performed by a network device, the method comprising:

20 configuring, for a user equipment, a plurality of resources for a two-step contention-free random access, wherein the plurality of resources comprises a preamble and a time frequency resource for a payload of the two-step contention-free random access, wherein the time frequency resource comprises a Physical Uplink Shared Channel, PUSCH, resource, and

receiving, from the user equipment, in a case that the plurality of resources for the
25 two-step contention-free random access have been configured for the user equipment, a contention-based random access message using a preamble from a preamble group selected, from a plurality of preamble groups configured for the user equipment, based on whether a first transport block size indicating a size of the payload that can be transmitted using the time frequency resource for the two-step contention-free random access corresponds to a

second transport block size configured for the preamble group configured for the user equipment.

12. A computer readable medium comprising program instructions for causing an
5 apparatus to perform at least the method of claims 7-9.