

Description

Title of Invention

COMMUNICATION APPARATUS AND COMMUNICATION METHOD

Technical Field

[0001]

The present disclosure relates to communication apparatuses and communication methods.

Background Art

[0002]

Wireless local area networks (LANs), typified by IEEE (Institute of Electrical and Electronics Engineers) 802.11, have in recent years been widespread, leading to an increase in the number of wireless LAN-capable products.

[0003]

Here, wireless LAN-capable products are classified into, for example, access points (hereinafter, also referred to as “APs”) and stations (hereinafter, also referred to as “STAs”). Further, communication from an AP to an STA called downlink (hereinafter, also referred to as “DL”) communication and communication from an STA to an AP called uplink (hereinafter, also referred to as “UL”) are performed.

[0004]

With the increase in the number of wireless LAN-capable products, the number of STAs also increases, and thus there is a possibility that the incidence of frame (packet) collision in uplink communication will increase.

[0005]

In this regard, Patent Literature 1 discloses a communication method of multiplexing UL transmission such that an STA having received a predetermined frame such as group polling from an AP transmits frames using a channel notified of through the predetermined frame. Thus, collision of UL transmission frames can be suppressed.

Citation List

Patent Literature

[0006]

Patent Literature 1:

JP 2015-511077T

Disclosure of Invention

Technical Problem

[0007]

However, the communication method disclosed in Patent Literature 1 is a method belonging to a so-called control access scheme in which UL transmission of the STA is controlled in accordance with a notification given from the AP. For this reason, UL communication of a so-called random access scheme in which the STA arbitrarily performs UL transmission is not a subject thereof.

[0008]

Embodiments of the present invention propose a communication apparatus and a communication method, which are novel and improved and capable of suppressing a decrease in communication efficiency in the UL communication of the random access scheme.

Solution to Problem

[0009]

According to a first aspect of the present invention, there is provided a communication apparatus, including: a communication unit configured to transmit a trigger frame to another communication apparatus being capable of random access, the trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources and receive a response frame to the trigger frame, the response frame being transmitted using at least one wireless communication resource selected from the sub area, wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area, wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.

[0010]

According to a second aspect of the present invention, there is provided a communication apparatus, including : a communication unit being capable of random access configured to receive a trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources and transmit a response frame to the trigger frame, wherein the communication unit transmits the response frame using at least one of the wireless communication resources selected from the sub area specified from the sub area information; wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area, wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.

[0011]

According to a third aspect of the present invention, there is provided a communication method, including: transmitting a trigger frame including sub area

information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources for random access; and receiving a response frame to the trigger frame, the response frame being transmitted using at least one wireless communication resource selected from the sub area; wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area, wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.

[0012]

According to a fourth aspect of the present invention, there is provided a communication method, including: receiving a trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources for random access; and transmitting a response frame to the trigger frame using at least one of the wireless communication resource selected from the sub area specified from the sub area information; wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area, wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.

[0012a]

According to a fifth aspect of the present invention, there is provided a communication system for wireless communication in a wireless local area network, said communication system including: a first communication apparatus according to the first aspect; and a second communication apparatus according to the second aspect.

Advantageous Effects of Invention

[0013]

As described above, according to the present disclosure, a communication apparatus and a communication method which are capable of suppressing a decrease in communication efficiency in the UL communication of the random access scheme are provided. Note that the above advantageous effects are not necessarily limiting. In addition to or instead of the above advantageous effects, any of the advantageous effects described in the present specification or other advantageous effects apparent from the present specification may be provided.

Brief Description of Drawings

[0014]

[FIG. 1] FIG. 1 is a diagram illustrating an example of a configuration of a communication system according to an embodiment of the present disclosure.

[FIG. 2] FIG. 2 is a diagram illustrating an example of a frame exchange sequence in

CLAIMS:

1. A communication apparatus, comprising:
a communication unit configured to transmit a trigger frame to another communication apparatus being capable of random access, the trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources and receive a response frame to the trigger frame, the response frame being transmitted using at least one wireless communication resource selected from the sub area,
wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area,
wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.
2. The communication apparatus according to claim 1, wherein the trigger frame further includes information corresponding to a data size of the response frame.
3. The communication apparatus according to any preceding claim, wherein the trigger frame includes information corresponding to a modulation and coding scheme, MCS.
4. The communication apparatus according to any preceding claim, wherein the trigger frame includes information corresponding to a type of uplink frame to be transmitted as a response to the trigger frame.
5. The communication apparatus according to any preceding claim, wherein the sub area information includes at least a field including information corresponding to a frequency channel and a field including information corresponding to a spatial stream.
6. The communication apparatus according to any preceding claim, wherein the trigger frame includes sub area information regarding a plurality of sub areas.
7. The communication apparatus according to any preceding claim, wherein the communication unit receives the response frame on the basis of the sub area information.

8. The communication apparatus according to any preceding claim, wherein the sub area is decided on the basis of attribute information associated with transmission of an uplink frame related to the response frame

9. The communication apparatus according to claim 8, wherein the attribute information associated with the transmission of the uplink frame includes at least one of a type of frame, a size of data to be transmitted, and a modulation scheme.

10. The communication apparatus according to any preceding claim, wherein the trigger frame is transmitted for each channel of a channel bonding target.

11. A communication apparatus, comprising:

a communication unit being capable of random access configured to receive a trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources and transmit a response frame to the trigger frame, wherein the communication unit transmits the response frame using at least one of the wireless communication resources selected from the sub area specified from the sub area information;

wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area,

wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.

12. The communication apparatus according to claim 11, wherein, in a case where the communication apparatus is able to use a plurality of channels at the same time, the communication unit transmits the response frame using a plurality of wireless communication resources selected from the sub area on the basis of the plurality of channels.

13. A communication system for wireless communication in a wireless local area network, said communication system comprising:

a first communication apparatus according to any of claims 1 to 10; and

a second communication apparatus according to claim 11 or 12.

14. A communication method, comprising:

transmitting a trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources for random access; and

receiving a response frame to the trigger frame, the response frame being transmitted using at least one wireless communication resource selected from the sub area;

wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area,

wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.

15. A communication method, comprising:

receiving a trigger frame including sub area information in which a sub area is specified from a resource area including wireless communication resources selectable as uplink resources for random access; and

transmitting a response frame to the trigger frame using at least one of the wireless communication resource selected from the sub area specified from the sub area information;

wherein the sub area information includes a plurality of sub area fields, each of the sub area fields including a condition parameter field associated with a sub area,

wherein each of the condition parameter fields includes information related to a modulation scheme and a coding rate.