

RESOURCE ALLOCATION SIGNALING IN A WIRELESS LOCAL AREA NETWORK

PREAMBLE

FIELD OF THE INVENTION

5 The present invention relates to a wireless communication, and more particularly, to a new method of resource allocation signaling in a WLAN and apparatus.

BACKGROUND OF THE INVENTION

10 In the IEEE 802.11ax standard, OFDMA modulation was first introduced. The description of which RUs are used for a given PPDU is given in its SIG-B field (and defined in details in the 802.11ax standard, illustrated in FIG. 1). This field is comprised of 2 main sub-field: the common field and the user specific field as depicted in the 802.11ax standard.

15 The 802.11ax standard limits each non-AP STA to use a single resource unit (RU) that is comprised of contiguous tones (sub-carriers). Although there are various RU sizes defined in the standard (e.g. 26, 52, 106, 242, 484, 996 tones), restricting the allocation to a single RU limits the usage of the channel resource.

20 As mentioned above, in the current 802.11ax standard (i.e. the prior art) there are 6 sizes of RUs. In the allocation process, the scheduler can allocate only a single RU to a given STA in a MU-PPDU (Multi-User Phy Protocol Data Unit – the transmitted packet) or SU-PPDU (Single-User PPDU) transmission.

 If there is an unallocated RU, it cannot be assigned to a STA that has already been given a RU.

What is claimed is:

1. An apparatus for wireless communication, comprising:

a memory that stores instructions; and

a processor coupled with the memory, wherein the processor and the memory are

5 configured to:

generate a signaling field, SIG, in a wireless local area network, WLAN, the SIG

comprises a resource unit, RU, allocation field, indicating a size and location of each RU in a

frequency resource, the SIG further comprises one or more user fields, each user field

comprises information of a scheduled station, STA; wherein a MRU which comprises

10 multiple RUs is allowed to be assigned to same one or more STA;

transmit the SIG.

2. An apparatus for wireless communication, comprising:

a memory that stores instructions; and

a processor coupled with the memory, wherein the processor and the memory are

15 configured to:

receive a signaling field, SIG, in a wireless local area network, WLAN, the SIG comprises

a resource unit, RU, allocation field, indicating a size and location of each RU in a frequency

resource, the SIG further comprises one or more user field, each user field comprises

information of a scheduled station, STA; wherein a MRU which comprises multiple RUs is

20 allowed to be assigned to same one or more STA;

process the SIG.

3. The apparatus according to claim 1 or 2, wherein the MRU is a small MRU, which

comprises combination of 26-RU, 52-RU, or 106-RU in a 20 MHz frequency segment; or, the

MRU is a large MRU which comprises combination of 242-RU, 484-RU, or 996-RU in a

25 transmission bandwidth.

4. The apparatus according to claim 1 or 2, wherein the MRU comprises a first RU and

a second RU, the SIG comprises a first user field corresponding to the first RU and a second

user field corresponding to the second RU; both of the first user field and the second user field comprising a same ID of the STA.

5. The apparatus according to claim 4, the second user field further includes one or any combination of the following:

- 5 the number of RUs assigned to the STA; or,
 the size and location of each RU in the MRU assigned to the STA.

6. The apparatus according to claim 1 or 2, wherein a common field of the SIG comprises information for small MRU allocated in a corresponding 20 MHz frequency segment; and/or information for a number of a large MRU allocated in a bandwidth of the
10 transmission.

7. The apparatus according to claim 1 or 2, the SIG comprises a Single-RU user field and a MRU user field; the Single-RU user field corresponds to a RU which is not a MRU; a MRU user field corresponds to a MRU, comprising at least the following: a STA_ID and a RU bitmap indicating size and location of each RU comprised in the MRU.

15 8. The apparatus according to claim 1 or 2, wherein the SIG comprises a Common-MRU field indicating which 26-RUs are comprised in a MRU in a corresponding 20 MHz frequency segment; and/or indicating which 242-RUs are comprised in a MRU in a bandwidth of the transmission.

9. The apparatus according to claim 1 or 2, wherein the SIG comprises one or more
20 Common-MRU fields, each Common-MRU field indicating which actual allocated RUs are in a MRU.

10. The apparatus according to claim 1 or 2, wherein the SIG comprises puncturing information, indicating a non-contiguous large RU and one or more user-fields corresponding to the non-contiguous large RU, each of the one or more user-fields comprises a different
25 station's information.

11. A method for wireless communication, comprising:

generating a signaling field, SIG, in a wireless local area network, WLAN, the SIG comprises a resource unit, RU, allocation field, indicating a size and location of each RU in a frequency resource, the SIG further comprises one or more user field, each user field
5 comprises information of a scheduled station, STA; wherein a MRU which comprises multiple RUs is allowed to be assigned to same one or more STA,;
transmitting the SIG.

12. An method for wireless communication, comprising:

receiving a signaling field, SIG, in a wireless local area network, WLAN, the SIG
10 comprises a resource unit, RU, allocation field, indicating a size and location of each RU in a frequency resource, the SIG further comprises one or more user field, each user field comprises information of a scheduled station, STA; wherein a MRU which comprises multiple RUs is allowed to be assigned to same one or more STA,;
processing the SIG.

15 13. The method according to claim 11 or 12, wherein the MRU is a small MRU which comprises combination of 26-RU, 52-RU, or 106-RU in a 20 MHz frequency segment; or, the MRU is a large MRU which comprises combination of 242-RU, 484-RU, or 996-RU in a transmission bandwidth.

14. The method according to claim 11 or 12, wherein the MRU comprises a first RU and
20 a second RU, the EHT-SIG comprises a first user field corresponding to the first RU and a second user field corresponding to the second RU; both of the first user field and the second user field comprising a same ID of the STA.

15. The method according to claim 14, the second user field further includes one or any combination of the following:

25 the number of RUs assigned to the STA; or
the size and location of each RU in the MRU assigned to the STA.

16. The method according to claim 11 or 12, a common field of the SIG comprises information for small MRU allocated in a corresponding 20 MHz frequency segment; and/or, information for a number of a large MRU allocated in a bandwidth of the transmission.

17. The method according to claim 11 or 12, the SIG comprises a Single-RU user field
5 and a MRU user field; the Single-RU user field corresponds to a RU which is not a MRU; a MRU user field corresponds to a MRU, comprising at least the following: a STA_ID and a RU bitmap indicating size and location of each RU comprised in the MRU.

18. The method according to claim 11 or 12, the SIG comprises a Common-MRU field
10 indicating which 26-RUs are comprised in a MRU in a corresponding 20 MHz frequency segment; and/or indicating which 242-RUs are comprised in a MRU in a bandwidth of the transmission.

19. The method according to claim 11 or 12, the SIG comprises one or more Common-MRU fields, each Common-MRU field indicating which actual allocated RUs are in a MRU.

20. The method according to claim 11 or 12, the SIG comprises puncturing information,
15 indicating a non-contiguous large RU and one or more user-fields corresponding to the non-contiguous large RU, each of the one or more user-fields comprises a different station's information.

21. A non-transitory computer-readable storage medium comprising instructions which,
20 when executed by a computer unit, the steps of the method of any one of claims 11 to 20 are carried out.