SUMMARY

[6] Non-limiting and exemplary embodiments facilitate providing communication apparatuses and communication methods for control signaling in context of EHT WLAN.

[7] According to an embodiment of the present disclosure, there is provided a communication apparatus comprising circuitry which, in operation, generates a transmission signal comprising a plurality of user fields and a data field, the data field comprising a plurality of resource units (RUs); and a transmitter, which, in operation, transmits the generated transmission signal, wherein a single transmission scheme is applied to one or more RUs of the plurality of RUs, which are assigned to another wireless communication apparatus, and wherein one or more user fields of the plurality of user fields are addressed to the another wireless communication apparatus and a number of the one or more user fields addressed to the another wireless communication apparatus is equal to a number of the one or more RUs assigned to the another wireless communication apparatus, and the one or more user fields addressed to the another wireless communication apparatus correspond to the one or more RUs assigned to the another wireless communication apparatus respectively, wherein each of the plurality of user fields is either a type 1 user field or a type 2 user field and contains a signaling for indicating its type; and the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 1 user field, and wherein the type 1 user field contains user-specific allocation information while the type 2 user field does not contain user-specific allocation information.

[8] According to another embodiment of the present disclosure, there is provided a communication apparatus comprising a receiver, which, in operation, receives a signal comprising a plurality of user fields and a data field, the data field comprising a plurality of RUs; and circuitry, which, in operation, processes the received signal, wherein a single transmission scheme is applied to one or more RUs of the plurality of RUs, which are assigned to the wireless communication apparatus, and wherein one or more user fields of the plurality of user fields are addressed to the wireless communication apparatus and a number of the one or more user fields addressed to the wireless communication apparatus is equal to a number of the one or more RUs assigned to the wireless communication

apparatus, and the one or more user fields addressed to the wireless communication apparatus correspond to the one or more RUs assigned to the wireless communication apparatus respectively, wherein each of the plurality of user fields is either a type 1 user field or a type 2 user field and contains a signaling for indicating its type; and the one or more user fields addressed to the wireless communication apparatus comprises at least one type 1 user field, and wherein the type 1 user field contains user-specific allocation information while the type 2 user field does not contain user-specific allocation information.

[9] According to yet another embodiment of the present disclosure, there is provided a communication method comprising generating a transmission signal comprising a plurality of user fields and a data field, the data field comprising a plurality of RUs; and transmitting the generated transmission signal, wherein a

single transmission scheme is applied to one or more RUs of the plurality of RUs, which are assigned to another wireless communication apparatus, and wherein one or more user fields of the plurality of user fields are addressed to the another wireless communication apparatus and a number of the one or more user fields addressed to the another wireless communication apparatus is equal to a number of the one or more RUs assigned to the another wireless communication apparatus, and the one or more user fields addressed to the another wireless communication apparatus correspond to the one or more RUs assigned to the another wireless communication apparatus respectively, wherein each of the plurality of user fields is either a type 1 user field or a type 2 user field and contains a signaling for indicating its type; and the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 1 user field, and wherein the type 1 user field contains user-specific allocation information while the type 2 user field does not contain user-specific allocation information.

[10] It should be noted that general or specific embodiments may be implemented as a system, a method, an integrated circuit, a computer program, a storage medium, or any selective combination thereof.

[11] Additional benefits and advantages of the disclosed embodiments will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various embodiments and features of the specification and drawings, which need not all be provided in order to obtain one or more of such benefits and/or advantages.

BRIEF DESCRIPTION OF THE DRAWINGS

[12] Embodiments of the disclosure will be better understood and readily apparent to one of ordinary skilled in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[13] Fig. 1A depicts a schematic diagram of uplink and downlink single-user (SU) multiple input multiple output (MIMO) communications between an access point (AP) and a station (STA) in a MIMO wireless network.

[14] Fig. 1B depicts a schematic diagram of downlink multi-user MIMO (MU-MIMO) communications between an AP and multiple STAs in a MIMO wireless network.

[15] Fig. 1C depicts a schematic diagram of uplink MU-MIMO communications between an AP and multiple STAs in a MIMO wireless network

CLAIMS

1. A wireless communication apparatus comprising:

circuitry, which, in operation, generates a transmission signal comprising a plurality of user fields and a data field, the data field comprising a plurality of resource units (RUs); and

a transmitter, which, in operation, transmits the generated transmission signal,

wherein a single transmission scheme is applied to one or more RUs of the plurality of RUs, which are assigned to another wireless communication apparatus,

wherein one or more user fields of the plurality of user fields are addressed to the another wireless communication apparatus and a number of the one or more user fields addressed to the another wireless communication apparatus is equal to a number of the one or more RUs assigned to the another wireless communication apparatus, and the one or more user fields addressed to the another wireless communication apparatus correspond to the one or more RUs assigned to the another wireless communication apparatus respectively,

wherein each of the plurality of user fields is either a type 1 user field or a type 2 user field and contains a signaling for indicating its type; and the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 1 user field, and

wherein the type 1 user field contains user-specific allocation information while the type 2 user field does not contain user-specific allocation information.

2. The wireless communication apparatus of claim 1, wherein the one or more user fields addressed to the another wireless communication apparatus contain same user-specific allocation information.

3. The wireless communication apparatus of claim 1, wherein each of the at least one type 1 user field contains a signaling for indicating whether a single RU is assigned to the another wireless communication apparatus.

4. The wireless communication apparatus of claim 1, wherein if the number of the one or more RUs assigned to the another wireless communication apparatus is more than one, the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 2 user field, and each of the at

least one type 2 user field contains a signaling for indicating the number of the one or more RUs assigned to the another wireless communication apparatus.

5. The wireless communication apparatus of claim 1, wherein if the number of the one or more RUs assigned to the another wireless communication apparatus is more than one, the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 2 user field, and each of the at least one type 2 user field contains a signaling for indicating whether the one or more RUs assigned to the another wireless communication apparatus are contiguous.

6. The wireless communication apparatus of claim 1, wherein if the number of the one or more RUs assigned to the another wireless communication apparatus is more than one, the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 2 user field, and each of the at least one type 2 user field contains a signaling for indicating a different RU among the one or more RUs assigned to the another wireless communication apparatus.

7. The wireless communication apparatus of claim 1, wherein if the number of the one or more RUs assigned to the another wireless communication apparatus is more than one, the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 2 user field, and each of the at least one type 2 user field contains a signaling for indicating a position of the RU corresponding to the each of the at least one type 2 user field among the one or more RUs assigned to the another wireless communication apparatus.

8. The wireless communication apparatus of claim 1, wherein only the last user field of the one or more user fields addressed to the another wireless communication apparatus is a type 1 user field.

9. A wireless communication apparatus comprising:

a receiver, which, in operation, receives a signal comprising a plurality of user fields and a data field, the data field comprising a plurality of resource units (RUs); and

circuitry, which, in operation, processes the received signal,

wherein a single transmission scheme is applied to one or more RUs of the plurality of RUs, which are assigned to the wireless communication apparatus,

wherein one or more user fields of the plurality of user fields are addressed to the wireless communication apparatus and a number of the one or more user fields

addressed to the wireless communication apparatus is equal to a number of the one or more RUs assigned to the wireless communication apparatus, and the one or more user fields addressed to the wireless communication apparatus corresponds to the one or more RUs assigned to the wireless communication apparatus respectively,

wherein each of the plurality of user fields is either a type 1 user field or a type 2 user field and contains a signaling for indicating its type; and the one or more user fields addressed to the wireless communication apparatus comprises at least one type 1 user field, and

wherein the type 1 user field contains user-specific allocation information while the type 2 user field does not contain user-specific allocation information.

10. The wireless communication apparatus of claim 11, wherein the one or more user fields addressed to the wireless communication apparatus contain same user-specific allocation information.

11. A wireless communication method comprising:

generating a transmission signal comprising a plurality of user fields and a data field, the data field comprising a plurality of resource units (RUs); and

transmitting the generated transmission signal,

wherein a single transmission scheme is applied to one or more RUs of the plurality of RUs, which are assigned to another wireless communication apparatus,

wherein one or more user fields of the plurality of user fields are addressed to the another wireless communication apparatus and a number of the one or more user fields addressed to the another wireless communication apparatus is equal to a number of the one or more RUs assigned to the another wireless communication apparatus, and the one or more user fields addressed to the another wireless communication apparatus corresponds to the one or more RUs assigned to the another wireless communication apparatus respectively,

wherein each of the plurality of user fields is either a type 1 user field or a type 2 user field and contains a signaling for indicating its type; and the one or more user fields addressed to the another wireless communication apparatus comprises at least one type 1 user field, and

wherein the type 1 user field contains user-specific allocation information while the type 2 user field does not contain user-specific allocation information.