

CLAIMS

1. A method for soliciting a trigger-based (TB) physical layer protocol data unit (PPDU) transmission in a wireless local area network (WLAN), the method comprising:

generating (1301), by an access point (AP), a trigger frame based on a type of TB PPDU transmissions to be solicited from a plurality of stations (STAs) in the WLAN, wherein the type of TB PPDU transmissions comprises high efficiency (HE) TB PPDU transmissions, or extremely high throughput (EHT) TB PPDU transmissions, and one or two subfields in the trigger frame indicate a bandwidth (BW) of the solicited TB PPDU;

transmitting (1302), by the AP, the generated trigger frame to the plurality of STAs; and

receiving, by the AP, the solicited TB PPDU in the BW indicated by the one or two subfields in the trigger frame,

wherein a common info field of the trigger frame comprises an uplink (UL) bandwidth (BW) subfield indicating a BW of the solicited HE TB PPDU;

wherein the common info field of the trigger frame further comprises an enhanced trigger frame flag subfield which indicates whether the trigger frame is an 802.11ax trigger frame or an enhanced trigger frame, when the enhanced trigger frame flag subfield indicates that the trigger frame is the enhanced trigger frame, both the UL BW subfield and a Delta EHT UL BW subfield indicate a BW of the solicited EHT TB PPDU; and

wherein the UL BW subfield occupies 2 bits in the common info field of the trigger frame and the Delta EHT UL BW subfield occupies 2 bits of the enhanced trigger frame.

2. The method according to claim 1, wherein the enhanced trigger frame flag subfield is located between a UL spatial reuse subfield and a trigger dependent common info subfield in the common info field of the trigger frame.

3. The method according to claim 2, wherein the enhanced trigger frame flag subfield occupies 1 bit in the common info field of the trigger frame, the UL spatial reuse subfield occupies 16 bits in the common info field of the trigger frame, and a length of the trigger dependent common info subfield is variable.

4. The method according to claim 2, wherein the common info field of the trigger frame further comprises:

a trigger type subfield, a UL length subfield, a more trigger frame (TF) subfield, a carrier sensing (CS) required subfield, which are all before the UL BW subfield in the common info field of the trigger frame; and

a guard interval (GI) and HE-long training field (HE-LTF) type subfield, a multi-user multiple-input multiple-output (MU-MIMO) HE-LTF mode subfield, a number of HE-LTF symbols and midamble periodically subfield, a UL space-time block coding (STBC) subfield, a low density parity check (LDPC) extra symbol segment subfield, an access point transmission (AP TX) power subfield, a pre-forward error correction (pre-FEC) padding factor subfield, a package extension (PE) dis-ambiguity subfield, which are all between the UL BW subfield and

the UL spatial reuse subfield in the common info field of the trigger frame.

5. The method according to claim 4, wherein the trigger type subfield, the UL length subfield, the more TF subfield, the CS required subfield, the GI and HE-LTF type subfield, the MU-MIMO HE-LTF mode subfield, the number of HE-LTF symbols and midamble periodically subfield, the UL STBC subfield, the LDPC extra symbol segment subfield, the AP TX power subfield, the pre-FEC padding factor subfield, and the PE dis-ambiguity subfield occupy 4 bits, 12 bits, 1 bit, 1 bit, 2 bits, 1 bit, 3 bits, 1 bit, 1 bit, 1 bit, 2 bits, and 1 bit in the common info field of the trigger frame, respectively.

6. The method according to claim 1, wherein the BW of the solicited HE TB PPDU indicated by the UL BW subfield in the common info field of the trigger frame is in the HE SIGNAL A (HE SIG-A) field of the solicited HE TB PPDU.

7. A method for soliciting a trigger-based (TB) physical layer protocol data unit (PPDU) transmission in a wireless local area network (WLAN), the method comprising:

receiving (1401), by a station (STA), a trigger frame which is used to solicit a type of TB PPDU transmissions from a plurality of STAs in the WLAN, wherein the type of TB PPDU transmissions comprises high efficiency (HE) trigger-based (TB) PPDU transmissions, or extremely high throughput (EHT) TB PPDU transmissions, and one or two subfields in the trigger frame indicate a bandwidth (BW) of the solicited TB PPDU, and

transmitting (1402), by the STA, the solicited TB PPDU in the BW indicated by the one or two subfields in the trigger frame;

wherein a common info field of the trigger frame comprises an uplink (UL) bandwidth (BW) subfield indicating a BW of the solicited HE TB PPDU;

wherein the common info field of the trigger frame further comprises an enhanced trigger frame flag subfield which indicates whether the trigger frame is an 802.11ax trigger frame or an enhanced trigger frame, when the enhanced trigger frame flag subfield indicates that the trigger frame is the enhanced trigger frame, both the UL BW subfield and a Delta EHT UL BW subfield indicate a BW of the solicited EHT TB PPDU; and

wherein the UL BW subfield occupies 2 bits in the common info field of the trigger frame and the Delta EHT UL BW subfield occupies 2 bits of the enhanced trigger frame.

8. The method according to claim 7, wherein the enhanced trigger frame flag subfield is located between a UL spatial reuse subfield and a trigger dependent common info subfield in the common info field of the trigger frame.

9. The method according to claim 8, wherein the enhanced trigger frame flag subfield occupies 1 bit in the common info field of the trigger frame, the UL spatial reuse subfield occupies 16 bits in the common info field of the trigger frame, and a length of the trigger dependent common info subfield is variable.

10. The method according to claim 8, wherein the common info field of the trigger frame further comprises:

a trigger type subfield, a UL length subfield, a more trigger frame (TF) subfield, a carrier sensing (CS) required subfield, which are all before the UL BW subfield in the common info field of the trigger frame; and

5 a guard interval (GI) and HE-long training field (HE-LTF) type subfield, a multi-user multiple-input multiple-output (MU-MIMO) HE-LTF mode subfield, a number of HE-LTF symbols and midamble periodically subfield, a UL space-time block coding (STBC) subfield, a low density parity check (LDPC) extra symbol segment subfield, an access point transmission (AP TX) power subfield, a pre-forward error correction (pre-FEC) padding factor subfield, a package extension (PE) dis-ambiguity subfield, which are all between the UL BW subfield and
10 the UL spatial reuse subfield in the common info field of the trigger frame.

11. The method according to claim 10, wherein the trigger type subfield, the UL length subfield, the more TF subfield, the CS required subfield, the GI and HE-LTF type subfield, the MU-MIMO HE-LTF mode subfield, the number of HE-LTF symbols and midamble periodically subfield, the UL STBC subfield, the LDPC extra symbol segment subfield, the AP TX power
15 subfield, the pre-FEC padding factor subfield, and the PE dis-ambiguity subfield occupy 4 bits, 12 bits, 1 bit, 1 bit, 2 bits, 1 bit, 3 bits, 1 bit, 1 bit, 1 bit, 2 bits, and 1 bit in the common info field of the trigger frame, respectively.

12. The method according to claim 7, wherein the BW of the solicited HE TB PPDU indicated by the UL BW subfield in the common info field of the trigger frame is in the HE
20 SIGNAL A (HE SIG-A) field of the solicited HE TB PPDU.

13. The method according to claim 7, wherein the BW of the solicited EHT TB PPDU indicated by both the UL BW subfield and the Delta EHT UL BW subfield or by both the UL BW subfield and the UL BW extension subfield is in the universal SIGNAL (U-SIG) field of the solicited EHT TB PPDU.

25 14. The method according to claim 7, wherein the BW of the solicited EHT TB PPDU is 20 MHz, 40 MHz, 80 MHz, 160 MHz or 320 MHz.

15. The method according to any one of claims 7 to 14, wherein one of the following applies:

30 wherein the indicated BW of the solicited EHT TB PPDU is the same as the indicated BW of the solicited HE TB PPDU when the indicated BW of the solicited EHT TB PPDU is 20 MHz, 40 MHz, 80 MHz or 160 MHz;

wherein the indicated BW of the solicited EHT TB PPDU is the next available BW larger than the indicated BW of the solicited HE TB PPDU when the indicated BW of the solicited EHT TB PPDU is 320 MHz; or

35 wherein the indicated BW of the solicited EHT TB PPDU is the next available BW smaller than the indicated BW of the solicited HE TB PPDU when the indicated BW of the solicited EHT TB PPDU is 80 MHz.

16. The method according to any one of claims 7 to 15, wherein the enhanced trigger

frame includes a common info field and a user info list field comprising one or more user info fields.

17. The method according to any one of claims 7 to 16, wherein the BW of the solicited HE TB PPDU is 20 MHz, 40 MHz, 80 MHz or 160/80+80 MHz.

5 18. The method according to any one of claims 7 to 17, wherein the plurality of STAs comprises HE STAs and/or EHT STAs.

19. An access point (AP) for soliciting a trigger-based (TB) physical layer protocol data unit (PPDU) in a wireless local area network (WLAN), wherein the AP is configured to perform the method according to any one of claims 1 to 6.

10 20. A station (STA) for soliciting a trigger-based (TB) physical layer protocol data unit (PPDU) in a wireless local area network (WLAN), wherein the STA is configured to perform the method according to any one of claims 7 to 18.