IEEE P802.11  
Wireless LANs

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | D2.0 Comment Resolution for CID 13988 | | | | | | Date: 2022-08-15 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Alice Chen | Qualcomm |  |  | alicel@qti.qualcomm.com | | Sameer Vermani | Qualcomm |  |  | svverman@qti.qualcomm.com | | Youhan Kim | Qualcomm |  |  | youhank@qti.qualcomm.com | | Leonardo Lanante | Ofinno |  |  | llanante@ofinno.com | | Bin Tian | Qualcomm |  |  | btian@qtil.qualcomm.com | | Bo Sun | ZTE |  |  | sun.bo1@zte.com.cn | | Wook Bong Lee | Samsung |  |  | wookbong.lee@samsung.com | |

Abstract

This submission proposes resolutions for the following comment on P802.11be D2.0: CID 13988 in 36.3.12.7.2.

NOTE – Set the Track Changes Viewing Option in the MS Word to “All Markup” to clearly see the proposed text edits.

**Revision History:**

R0: Initial version. Resolve CID 13988.

R1: Minor revision.

R2: Correct one typo.

# CID 13988

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** | **Resolution** |
| 13988 | 36.3.12.7.2 | 642.37 | According to this sentence, a STA reports information from the version independent fields within the RXVECTOR regardless of the PHY Version Identifier field. However, the RXVECTOR parameter FORMAT and other RXVECTOR parameters are not defined when the PHY Version Identifier field does not indicate EHT. | Define the RXVECTOR parameter FORMAT for the case when the PHY Version Identifier field does not indicate EHT, and define other RXVECTOR parameters for that case. | Revised.  Agree to the comment that need to define one RXVECTOR parameter FORMAT for beyond EHT versions, and a few other RXVECTOR parameters for the version independent fields of that FORMAT case.  Instruction to editor:  *Please make changes for CID 13988 as shown in the following document*  [*https://mentor.ieee.org/802.11/dcn/22/11-22-1347-02-00be-d2.0-comment-resolution-for-cid-13988.docx*](https://mentor.ieee.org/802.11/dcn/22/11-22-1347-02-00be-d2.0-comment-resolution-for-cid-13988.docx) |

***Instructions to the editor:***

**Please make the changes to subclause 36.2.2 in P563L49-P576L41 in 802.11be spec draft D2.1.1 (corresponding to P547L49-P560L41 in 802.11be spec draft D2.0) as shown below for CID 13988:**

**36.2.2 TXVECTOR and RXVECTOR parameters**

The parameters in Table 36-1 (TXVECTOR and RXVECTOR parameters) are defined as part of the TXVECTOR parameter list in the PHY-TXSTART.request primitive for PPDU transmitting and/or as part of the RXVECTOR parameter list in the PHY-RXSTART.indication and PHY-RXEND.indication primitives for PPDU receiving. For forward compatibility, an EHT STA may receive a PPDU with an unknown PPDU format that is defined after clause 36, which contains the L-STF, L-LTF, L-SIG, RL-SIG and U-SIG fields, and has the PHY Version Identifier field in the U-SIG field set to a Validate value. In such cases, it shall still report the information from the version independent fields in the U-SIG field within the RXVECTOR. A value of PHY\_VER\_UNKNOWN is defined in the RXVECTOR parameter FORMAT to indicate such a PPDU format.. When the RXVECTOR parameter FORMAT is PHY\_VER\_UNKNOWN, the RXVECTOR contains only six parameters – FORMAT, RSSI\_LEGACY, CH\_BANDWIDTH, TXOP\_DURATION, BSS\_COLOR and UPLINK\_FLAG.

**Table 36-1—TXVECTOR and RXVECTOR parameters**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | | **Value** | | **TXVECTOR** | | | **RXVECTOR** |
| FORMAT |  | | Determines the format of the PPDU. Enumerated type:  NON\_HT indicates Clause 15, Clause 16, Clause 17, Clause 18, or non-HT duplicate PPDU format. In this case, the modulation is determined by the NON\_HT\_MODULA- TION parameter defined in Table 19-1 (TXVECTOR and RXVECTOR parameters).  HT\_MF indicates HT-mixed format. HT\_GF indicates HT-greenfield format. VHT indicates VHT format.  HE\_SU indicates HE SU PPDU format. HE\_MU indicates HE MU PPDU format. HE\_ER\_SU indicates HE ER SU PPDU format. HE\_TB indicates HE TB PPDU format.  EHT\_MU indicates EHT MU PPDU format. EHT\_TB indicates EHT TB PPDU format.  PHY\_VER\_UNKNOWN indicates a PPDU format that contains the L-STF, L-LTF, L-SIG, RL-SIG and U-SIG fields, and has the PHY Version Identifier field in the U-SIG field set to a Validate value. Refer to Table 36-28 and Table 36-31.  The enumerated type PHY\_VER\_UNKNOWN is not used in the TXVECTOR. | | Y | | | Y |
| EHT\_PPDU\_TYPE | | | FORMAT is EHT\_MU and UPLINK\_FLAG is 0 | | Set to 0 to indicate a DL OFDMA transmission (including non-MU-MIMO and MU-MIMO).  Set to 1 to indicate a transmission to a single user or EHT sounding NDP not addressed to an AP.  Set to 2 to indicate a DL MU-MIMO (non-OFDMA) transmission. | | Y | Y | | |
| FORMAT is EHT\_MU and UPLINK\_FLAG is 1 | | Set to 1 to indicate an UL transmission to a single user or EHT sounding NDP. | | Y | Y | | |
| FORMAT is EHT\_TB | | Set to 0. | | O | O | | |
| FORMAT is PHY\_VER\_UNKNOWN | | Not present. | | | | | |
| L\_LENGTH | | | FORMAT is EHT\_MU | | Not present.  NOTE—The LENGTH field of the L-SIG field for EHT MU PPDU is defined in [Equation (36-17)](file:///C:\Users\alicel\AppData\Local\Temp\Temp1_Draft%20P802.11be_D2.1.1%20-%20Word.zip\Draft%20P802.11be_D2.1.1%20-%20Word\TGbe_Cl_36.doc#bookmark97) using the TXTIME value defined in [36.4.3 (TXTIME and PSDU\_LENGTH](file:///C:\Users\alicel\AppData\Local\Temp\Temp1_Draft%20P802.11be_D2.1.1%20-%20Word.zip\Draft%20P802.11be_D2.1.1%20-%20Word\TGbe_Cl_36.doc#bookmark334) [calculation)](file:///C:\Users\alicel\AppData\Local\Temp\Temp1_Draft%20P802.11be_D2.1.1%20-%20Word.zip\Draft%20P802.11be_D2.1.1%20-%20Word\TGbe_Cl_36.doc#bookmark334), which in turn depend on other parameters including the TXVECTOR parameter APEP\_LENGTH. | | N | N | | |
| FORMAT is EHT\_TB | | Indicates the value used to calculate the LENGTH field of the L-SIG field. See [36.3.12.5 (L-SIG)](file:///C:\Users\alicel\AppData\Local\Temp\Temp1_Draft%20P802.11be_D2.1.1%20-%20Word.zip\Draft%20P802.11be_D2.1.1%20-%20Word\TGbe_Cl_36.doc#bookmark96) for details.  The value of this parameter comes from the triggering frame to which the EHT TB PPDU is the response (see 9.3.1.22.2 (Common Info field) for details). | | Y | N | | |
| FORMAT is PHY\_VER\_UNKNOWN | | Not present. | | | | | |
| Otherwise | | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters), Table 21-1 (TXVECTOR and RXVECTOR parameters), or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | | | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| L\_DATARATE | FORMAT is NON\_HT | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | Data rate signaled in L-SIG field: 6 Mb/s | Y | N |
| N\_TX | FORMAT is EHT\_MU or EHT\_TB | Indicates the number of transmit chains. | Y | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| EXPANSION\_MAT | FORMAT is EHT\_MU and PSDU\_LENGTH > 0 | For each user, contains a vector in the number of all the subcarriers in an RU or MRU that is assigned to this user. The vector for each subcarrier contains feedback matrices as defined in [36.3.17.2 (EHT beamforming feedback matrix V)](#bookmark276) based on the channel measured during the training symbols of previous EHT sounding NDPs, HE NDPs or VHT NDPs. | MU | N |
| FORMAT is EHT\_TB | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in [36.3.17.2 (EHT](#bookmark276) [beamforming feedback matrix V)](#bookmark276) based on the channel measured during the training symbols of previous EHT sounding NDPs, HE NDPs or VHT NDPs. | O | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| CHAN\_MAT | FORMAT is EHT\_MU and PSDU\_LENGTH is 0 | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in [36.3.17.2 (EHT](#bookmark276) [beamforming feedback matrix V)](#bookmark276) based on the channel measured during the training symbols of the currently received EHT sounding NDP. | N | Y |
| FORMAT is EHT\_TB, or  FORMAT is EHT\_MU and PSDU\_LENGTH is greater than 0, or FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| DELTA\_SNR | FORMAT is EHT\_MU and PSDU\_LENGTH is 0 | Contains an array of delta SNR values as defined in 9.4.1.72 (EHT MU Exclusive Beamforming Report field) based on the channel measured during the training symbols of the received EHT sounding NDP. | N | Y |
| FORMAT is EHT\_TB, or  FORMAT is EHT\_MU and PSDU\_LENGTH is greater than 0, or FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| NO\_SIG\_EXTN | FORMAT is EHT\_MU or EHT\_TB | Indicates whether signal extension needs to be applied at the end of transmission.  Boolean:  true indicates that no signal extension is present. false indicates that a signal extension is present. | Y | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| SNR | FORMAT is EHT\_MU and PSDU\_LENGTH is 0 | Contains an array of average values of received SNR measurements for each spatial stream. SNR indications of 8 bits are supported. Average value of SNR shall be the sum of the decibel values of SNR per subcarrier divided by the number of subcarriers represented in each stream as described in 9.4.1.71 (EHT Compressed Beamforming Report field). | N | Y |
| FORMAT is EHT\_TB, or  FORMAT is EHT\_MU and PSDU\_LENGTH is greater than 0, or FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters), Table 21-1 (TXVECTOR and RXVECTOR parameters), or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| CQI | FORMAT is EHT\_MU and PSDU\_LENGTH is 0 | Contains an array of received per-RU average SNRs for each spatial stream, where each per-RU average SNR is the arithmetic mean of the SNR in decibels over a 26-tone RU as described in 9.4.1.73 (EHT CQI Report field). | N | Y |
| FORMAT is EHT\_TB, or  FORMAT is EHT\_MU and PSDU\_LENGTH is greater than 0, or FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| GI\_TYPE | FORMAT is EHT\_MU or EHT\_TB | Indicates the length of the GI for the EHT-LTF and Data fields. Enumerated type:  0u8s\_GI indicates 0.8 µs. 1u6s\_GI indicates 1.6 µs. 3u2s\_GI indicates 3.2 µs.  NOTE—The length of GI for pre-EHT modulated fields is  0.8 µs | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| FEC\_CODING | FORMAT is EHT\_MU or EHT\_TB | Indicates the FEC encoding used. Enumerated type:  BCC\_CODING indicates BCC coding. LDPC\_CODING indicates LDPC coding. | MU | MU |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| LDPC\_EXTRA\_SYMBOL | FORMAT is EHT\_TB | Indicates the presence of the LDPC extra symbol segment in an EHT TB PPDU.  Integer:  1 indicates that an LDPC extra symbol segment is present. 0 indicates that an LDPC extra symbol segment is not pres- ent. | Y | N |
| FORMAT is EHT\_MU or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| TXPWR\_ LEVEL\_INDEX | FORMAT is EHT\_MU or EHT\_TB | The allowed values for the TXPWR\_LEVEL\_INDEX parameter are in the range from 1 to numberOfOctets (dot11TxPowerLevelExtended)/2. This parameter is used to indicate which of the available transmit power levels defined in dot11TxPowerLevelExtended shall be used for the current transmission. | Y | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| RSSI | FORMAT is EHT\_MU or EHT\_TB | The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antennas used to receive the current PPDU measured during the reception of the EHT-LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. | N | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| RSSI\_LEGACY | FORMAT is EHT\_MU or EHT\_TB | The allowed values for the RSSI\_LEGACY parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antennas used to receive the current PPDU measured during the reception of non-EHT portion of the EHT PPDU preamble. RSSI\_LEGACY is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. | N | Y |
| FORMAT is PHY\_VER\_UNKNOWN | The allowed values for the RSSI\_LEGACY parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antennas used to receive the current PPDU measured during the reception of the preamble portion before U-SIG. RSSI\_LEGACY is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. | N | Y |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| MCS | FORMAT is EHT\_MU or EHT\_TB | Indicates the modulation and coding schemes used in the transmission of the Data field of the PPDU.  Integer: range 0 to 15. | MU | MU |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters), Table 21-1 (TXVECTOR and RXVECTOR parameters), or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| MCS\_EHT\_SIG | FORMAT is EHT\_MU | Indicates the modulation and coding scheme used for the EHT\_SIG field.  Integer:   1. indicates EHT-MCS 0. 2. indicates EHT-MCS 1. 3. indicates EHT-MCS 3. 4. indicates EHT-MCS 15. | Y | N |
| Otherwise | Not present. | | |
| REC\_MCS | FORMAT is EHT\_MU | Indicates the EHT-MCS that the receiver recommends. | N | O |
| FORMAT is EHT\_TB or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| CH\_BANDWIDTH | FORMAT is EHT\_MU or EHT\_TB | Indicates the channel width of the PPDU. Enumerated type:  CBW20 for 20 MHz. CBW40 for 40 MHz. CBW80 for 80 MHz. CBW160 for 160 MHz. CBW320-1 for 320 MHz-1. CBW320-2 for 320 MHz-2. | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Indicates the channel width of the PPDU. Enumerated type:  CBW20 for 20 MHz. CBW40 for 40 MHz. CBW80 for 80 MHz. CBW160 for 160 MHz. CBW320-1 for 320 MHz-1. CBW320-2 for 320 MHz-2. | N | Y |
| Otherwise | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters), Table 21-1 (TXVECTOR and RXVECTOR parameters), or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| INACTIVE\_SUBCHANNELS | FORMAT is EHT\_MU, or  FORMAT is NON\_HT and NON\_HT\_MODULATION is NON\_HT\_DUP\_  OFDM, or FORMAT is EHT\_TB | Indicates the 20 MHz subchannels that are punctured.  A bitmap indexed by the 20 MHz subchannels in ascending order with the LSB indicating the lowest frequency 20 MHz subchannel. A bit is set to 1 to indicate that the corresponding 20 MHz subchannel is punctured and set to 0 to indicate the corresponding 20 MHz subchannel is not punctured.  See 35.12.5 (INACTIVE\_SUBCHANNELS) for details. | Y | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| CH\_BANDWIDTH\_IN\_NON\_HT | FORMAT is EHT\_MU, EHT\_TB or PHY\_VER\_UNKNOWN | Not present. | | |
| FORMAT is NON\_HT and NON\_HT\_MODULATION is NON\_HT\_DUP\_OFDM | In TXVECTOR, if present, indicates the channel width of the transmitted PPDU, which is signaled via the scrambling sequence and SERVICE field.  In RXVECTOR, if valid, indicates the channel width of the received PPDU, which is signaled via the scrambling sequence and SERVICE field.  Enumerated type:  CBW20 for 20 MHz,  CBW40 for 40 MHz CBW80 for 80 MHz, CBW160 for 160 MHz,  CBW320 for 320 MHz–1 and 320 MHz–2.  NOTE—In the RXVECTOR, the validity of this parameter is determined by the MAC based on the contents of the currently received MPDU (e.g., RTS) or the previous MPDU in an exchange (e.g., the RTS preceding a CTS). | O | Y |
| Otherwise | Not present. | | |
| APEP\_LENGTH | FORMAT is EHT\_MU or EHT\_TB | Integer.  If 0 and FORMAT is EHT\_MU, indicates an EHT sounding NDP. Otherwise, indicates the number of octets in the range 1 to aPSDUMaxLength in the A-MPDU pre-EOF padding (see [Table 36-70 (EHT PHY characteristics)](#bookmark347)) that is carried in the PSDU. | MU | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| PSDU\_LENGTH | FORMAT is EHT\_MU or EHT\_TB | Indicates the number of octets in the PSDU in the range 0 to aPSDUMaxLength octets (see [Table 36-70 (EHT PHY](#bookmark347) [characteristics)](#bookmark347)). A value of 0 indicates an EHT sounding NDP. | N | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| NUM\_STS | FORMAT is EHT\_MU | Indicates the number of spatial streams. Note that the terms “space-time stream” and “spatial streams” are equivalent because the EHT PHY does not support STBC.  Integer in the range:  1–4 per user per MU-MIMO RU in the TXVECTOR. 1–4 per MU-MIMO RU in the RXVECTOR.  1–8 per RU assigned to no more than 1 user in the TXVEC- TOR and RXVECTOR.  NUM\_STS summed over all users per RU is not greater than 8. | MU | Y |
| FORMAT is EHT\_TB | Indicates the number of spatial streams. Integer in the range:  1–4 for an MU-MIMO RU.  1–8 for an RU assigned to no more than 1 user.  NUM\_STS summed over all users per RU is not greater than 8. | Y | N |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| TXOP\_DURATION | FORMAT is EHT\_MU or EHT\_TB | Indicates the TXOP duration. Enumerated type or integer:  UNSPECIFIED indicates no NAV value specified. 0–8448 indicates a value in units of 1 µs that is used to update the NAV for this TXOP (see 26.2.4 (Updating two NAVs)).  The TXOP subfield in U-SIG is computed from the TXVECTOR parameter TXOP\_DURATION as follows:  TXOP\_DURATION = UNSPECIFIED: TXOP = 127. TXOP\_DURATION < 512:  TXOP = 2  floor(TXOP\_DURATION/8).  Otherwise: TXOP = 2  floor((TXOP\_DURATION – 512)/  128) + 1.  The RXVECTOR parameter TXOP\_DURATION is computed from the value of the TXOP subfield in U-SIG as follows:  TXOP = 127: TXOP\_DURATION = UNSPECIFIED.  TXOP is an even number: TXOP\_DURATION = 8  TXOP/2.  Otherwise: TXOP\_DURATION = 512 + 128  (TXOP – 1)/2. | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Indicates the TXOP duration. Enumerated type or integer:  UNSPECIFIED indicates no NAV value specified. 0–8448 indicates a value in units of 1 µs that is used to update the NAV for this TXOP (see 26.2.4 (Updating two NAVs)).  The RXVECTOR parameter TXOP\_DURATION is computed from the value of the TXOP subfield in U-SIG as follows:  TXOP = 127: TXOP\_DURATION = UNSPECIFIED.  TXOP is an even number: TXOP\_DURATION = 8 × TXOP/2.  Otherwise: TXOP\_DURATION = 512 + 128 × (TXOP – 1)/2. | N | Y |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| SPATIAL\_REUSE | FORMAT is EHT\_MU | Indicates the spatial reuse parameter value. There is one value of the parameter for an EHT MU PPDU. See the Spatial Reuse field definition [36.3.12.8.3 (Common field for OFDMA](#bookmark120) [transmission)](#bookmark120) and [36.3.12.8.4 (Common field for non-](#bookmark124) [OFDMA transmission)](#bookmark124).  See 35.11 (EHT Spatial reuse operation) and 35.12.2 (SPATIAL\_REUSE). | Y | Y |
| FORMAT is EHT\_TB | ndicates the spatial reuse parameter value. There are one to two values of the parameter for an EHT TB PPDU, with the number of values present dependent on the bandwidth of the PPDU. See the Spatial Reuse field definition in [36.3.12.7.2](#bookmark102) [(Content)](#bookmark102).  See 35.11 (EHT Spatial reuse operation) and 35.12.2 (SPATIAL\_REUSE). | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| [RU\_ALLOCATION](#bookmark120) | FORMAT is EHT\_MU and EHT\_PPDU\_TYPE is equal to 0 | For the TXVECTOR, indicates the 9-bit RU Allocation-1 and RU Allocation-2 (if present) subfields in the Common field for a DL OFDMA transmission.  9 bits for a 20 MHz PPDU; 18 bits for a 40 MHz PPDU; 36 bits for a 80 MHz PPDU; 72 bits for a 160 MHz PPDU;  144 bits for a 320 MHz-1 or 320 MHz-2 PPDU.  See [36.3.12.8.3 (Common field for OFDMA transmission)](#bookmark120) for details.  (#11337)For the RXVECTOR, 9 bits are used to indicate the RU or MRU allocated to the user in the whole band using the same encoding of PS160 (B39) and RU Allocation (B12–B19) subfields in the EHT variant User Info field of a Trigger frame.  See 9.3.1.22 (Trigger frame format) for details. | Y | Y |
| FORMAT is EHT\_MU and EHT\_PPDU\_TYPE is not equal to 0, or FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| FORMAT is EHT\_TB | 9 bits are used to indicate the RU or MRU allocated to the user in the whole band (#11338)using the same encoding of PS160 (B39) and RU Allocation (B12–B19) subfields in the EHT variant User Info field of a Trigger frame.  See 9.3.1.22 (Trigger frame format) for details. | Y | N |
| FORMAT is NON\_HT, NON\_HT\_MODULATION is  NON\_HT\_DUP\_OFDM, and CH\_BANDWIDTH is not CBW20 or CBW40 | For the TXVECTOR, indicates the active RU(s) or MRU(s).  36 bits for an 80 MHz PPDU; 72 bits for a 160 MHz PPDU; 144 bits for a 320 MHz PPDU.  For each 9 bits, only the following values are allowed: 26 (000011010 in binary representation)  64 (001000000 in binary representation)  See [36.3.12.8.3 (Common field for OFDMA transmission)](#bookmark120) and  [36.3.15 (Non-HT duplicate transmission)](#bookmark267) for details. | O | N |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| BEAMFORMED | FORMAT is EHT\_MU and APEP\_LENGTH is not 0 | For an RU or MRU with no more than 1 user allocated, set to 1 if a beamforming steering matrix is applied to this non-MU MIMO allocation and set to 0 otherwise. | MU | O |
| FORMAT is EHT\_MU and APEP\_LENGTH is 0 | Set to 1 if a beamforming steering matrix is applied to the EHT modulated fields and set to 0 otherwise. | Y | O |
| FORMAT is EHT\_TB | For an RU or MRU with no more than 1 user allocated, set to 1 if a beamforming steering matrix is applied to this non-MU MIMO allocation and set to 0 otherwise. | Y | O |
| FORMAT is PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) or Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| EHT\_LTF\_TYPE | FORMAT is EHT\_MU or EHT\_TB | Indicates the type of EHT-LTF. Enumerated type:  1EHT-LTF indicates an 1 EHT-LTF. 2EHT-LTF indicates a 2 EHT-LTF. 4EHT-LTF indicates a 4 EHT-LTF.  See [36.3.12.10 (EHT-LTF)](#bookmark159). | Y | Y |
| Otherwise | Not present. | | |
| NUM\_EHT\_LTF | FORMAT is EHT\_MU or EHT\_TB | Indicates the number of OFDM symbols in the EHT-LTF field.  See [Table 36-33 (Common field for OFDMA transmission)](#bookmark121), [Table 36-36 (Common field for non-OFDMA transmission to](#bookmark125) [a single user and non-OFDMA transmission to multiple users)](#bookmark125), [Table 36-37 (Common field for EHT sounding NDP)](#bookmark126), and  [36.3.12.10 (EHT-LTF)](#bookmark159). | Y | N |
| Otherwise | Not present. | | |
| STARTING\_STS\_NUM | FORMAT is EHT\_TB | Set to the starting spatial stream number minus 1 (spatial streams in a given PPDU transmission are numbered starting from 1) | Y | N |
| FORMAT is EHT\_MU or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| NOMINAL\_ PACKET\_PADDING | FORMAT is EHT\_MU | The nominal packing padding as defined in 9.4.2.313.5 (EHT PPE Thresholds field).  Possibles values are 0 µs, 8 µs, 16 µs, and 20 µs. | MU | N |
| FORMAT is EHT\_TB or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| TRIGGER\_ METHOD | FORMAT is EHT\_TB | Indicates the method used to trigger this EHT TB PPDU transmission.  Enumerated type:  TRIGGER\_FRAME for Trigger frame. TRS for TRS Control subfield. | Y | N |
| FORMAT is EHT\_MU or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| DEFAULT\_PE\_ DURATION | FORMAT is EHT\_TB | When TRIGGER\_METHOD is TRS, indicates the duration of the PE field to be transmitted. A value 0, 4, 8, 12, 16 or 20 indicating the PE field duration in µs. Otherwise not present. | Y | N |
| FORMAT is EHT\_MU or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| BSS\_COLOR | FORMAT is EHT\_MU or EHT\_TB | Set to a value in the range of 0 to 63 (see 35.12.1.4 (BSS\_COLOR)). | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | A value in the range of 0 to 63 (see 35.12.1.4 (BSS\_COLOR)). | N | Y |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| UPLINK\_FLAG | FORMAT is EHT\_MU | Set to 1 if the PPDU is addressed to an AP. Set to 0 otherwise. | Y | Y |
| FORMAT is PHY\_VER\_UNKNOWN | A value of 1 indicates the PPDU is addressed to an AP. A value of 0 indicates the PPDU is addressed to a non-AP STA. | N | Y |
| FORMAT is EHT\_TB | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| STA\_ID | FORMAT is EHT\_MU | Indicates the list of STA-IDs for an EHT MU PPDU (see  35.12.1.1 (STA\_ID)). | MU | Y |
| FORMAT is EHT\_TB or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| EHT\_PRE\_FEC\_ PADDING\_FACTOR | FORMAT is EHT\_TB | When TRIGGER\_METHOD is TRIGGER\_FRAME,  indicates the pre-FEC padding factor used by the EHT TB PPDU transmission. Otherwise not present. | Y | N |
| FORMAT is EHT\_MU or PHY\_VER\_UNKNOWN | Not present. | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| EHT\_TB\_PE\_ DISAMBIGUITY | FORMAT is EHT\_TB and TRIGGER\_METHOD is TRIGGER\_FRAME | Indicates PE disambiguity for the EHT TB PPDU transmission.  Set to 0 to indicate no PE disambiguity Set to 1 to indicate PE disambiguity | Y | N |
| Otherwise | Not present. | | |
| TB\_DISREGARD\_ IN\_USIG1 | FORMAT is EHT\_TB | Indicates the value to be set for the Disregard field in U-SIG-1. | Y | N |
| Otherwise | Not present. | | |
| TB\_VALIDATE\_ IN\_USIG2 | FORMAT is EHT\_TB | Indicates the value to be set for the Validate field in U-SIG-2. | Y | N |
| Otherwise | Not present. | | |
| TB\_DISREGARD\_ IN\_USIG2 | FORMAT is EHT\_TB | Indicates the value to be set for the Disregard field in U-SIG-2. | Y | N |
| Otherwise | Not present. | | |
| POWER\_BOOST  \_FACTOR | FORMAT is EHT\_MU | For an RU or MRU, set to the power boost factor of the RU or MRU respectively in the range of 0.5 to 2 (see 35.12.1.2 (POWER\_BOOST\_FACTOR)). | MU | N |
| Otherwise | Not present. | | |

**Table 36-1—TXVECTOR and RXVECTOR parameters *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| SCRAMBLER\_ INITIAL\_VALUE | FORMAT is EHT\_MU | The first 11 bits of the scrambling sequence (the eleven LSB bits of the Scrambler Initialization field prior to descrambling), with the first bit of the scrambling sequence being the LSB of SCRAMBLER\_INITIAL\_VALUE. | N | Y |
| FORMAT is EHT\_TB or PHY\_VER\_UNKNOWN | Not present | | |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters). | | |
| Further TXVECTOR and RXVECTOR parameters for transmitting or receiving a DSSS, HR/DSSS, OFDM, ERP, HT, VHT or HE PPDU, as determined by the FORMAT and NON\_HT\_MODULATION parameters, are defined in:   * DSSS PPDU: Table 15-1 (TXVECTOR parameters) and Table 15-2 (RXVECTOR parameters), excepting the LENGTH and DATARATE parameters * HR/DSSS PPDU: Table 16-5 (Parameter vectors), excepting the LENGTH and DATARATE parameters * OFDM PPDU: Table 17-1 (TXVECTOR parameters) and Table 17-2 (RXVECTOR parameters), excepting the LENGTH and DATARATE parameters * ERP PPDU: Table 18-1 (TXVECTOR parameters) and Table 18-3 (RXVECTOR parameters), excepting the LENGTH and DATARATE parameters * HT PPDU: Table 19-1 (TXVECTOR and RXVECTOR parameters) * VHT PPDU: Table 21-1 (TXVECTOR and RXVECTOR parameters) * HE PPDU: Table 27-1 (TXVECTOR and RXVECTOR parameters) | | | | |
| NOTE—In the “TXVECTOR” and “RXVECTOR” columns, the following apply:  Y = Present; N = Not present; O = Optional;  MU is only present in the TXVECTOR column for an EHT MU PPDU and indicates that the TXVECTOR parameter is present per user. Parameters specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to the number of users minus 1. | | | | |