IEEE P802.11  
Wireless LANs

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| CID 5914 | | | | |
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Abstract

This document contains a proposed resolution for CID 5914.

**CID 5914**

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| --- | --- | --- | --- | --- | --- |
| 5914 | 22.2.2 | 2458 | 40 | In Table 22-1, sometimes reference is made to Table 20-1 for HT-related values, while sometimes content of Table 20-1 is copied explicitly. | Propose to consistently refer to Table 20-1 when appropriate rather than duplicating text in both Table 22-1 and Table 20-1. |

This CID was discussed earlier in 802.11-15/1090r2 and it was agreed in principle to modify Table 22-1 to avoid duplicating parts of Table 20-1.

The Table below shows Table 22-1 and the proposed modifications. Some issues that require further discussion are highlighted.

**Proposed Resolution:**

**Modify Table 22-1 as shown below**

**Table 22-1—TXVECTOR and RXVECTOR parameters**

| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| --- | --- | --- | --- | --- |
| FORMAT |  | Determines the format of the PPDU.  Enumerated type:  NON\_HT indicates Clause 18 (Orthogonal frequency division  multiplexing (OFDM) PHY specification) (Orthogonal  frequency division multiplexing (OFDM) PHY specification)  or non-HT duplicate PPDU format. In this case, the  modulation is determined by the NON\_HT\_MODULATION  parameter.  HT\_MF indicates HT-mixed format.  HT\_GF indicates HT-greenfield format.  VHT indicates VHT format. | Y | Y |
| NON\_HT\_MODULATION | FORMAT is NON\_HT | In TXVECTOR, indicates the format type of the transmitted non-  HT PPDU.  In RXVECTOR, indicates the estimated format type of the  received non-HT PPDU.  Enumerated type:  OFDM indicates Clause 18 (Orthogonal frequency division  multiplexing (OFDM) PHY specification) (Orthogonal  frequency division multiplexing (OFDM) PHY specification)  format  NON\_HT\_DUP\_OFDM indicates non-HT duplicate format | Y | Y |
| Otherwise | Not Present | N | N |
| L\_LENGTH |  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| FORMAT is VHT | Not present  NOTE—The Length field of the L-SIG in VHT PPDUs is  defined in Equation (22-24) using the TXTIME value defined by  Equation (22-110) and Equation (22-111), which in turn depend  on other parameters including the TXVECTOR parameter  APEP\_LENGTH. | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | |
| L\_DATARATE |  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| FORMAT is VHT | Not present  NOTE—The RATE field in the L-SIG field in a VHT PPDU is  set to the value representing 6 Mb/s in the 20 MHz channel  spacing column of Table 18-6 (Contents of the SIGNAL field). | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| LSIGVALID | FORMAT is VHT | Not present | | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| SERVICE | FORMAT is VHT | Not present | | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| SMOOTHING | FORMAT is VHT | Not present | | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| AGGRGATION | FORMAT is VHT | Not present | | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| NUM\_EXTEN\_SS | FORMAT is VHT | Not present | | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| ANTENNA\_SET | FORMAT is VHT | Not present | | N | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| N\_TX | FORMAT is VHT | Indicates the number of transmit chains. | | Y | N |
|  |  | |  |  |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| EXPANSION\_MAT\_TYPE | FORMAT is VHT and  EXPANSION\_MAT  is present. | Set to COMPRESSED\_SV | Y | | Y |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| EXPANSION\_MAT | FORMAT is VHT and  EXPANSION\_MAT  is present. | Contains a vector in the number of selected subcarriers  containing feedback matrices as defined in 22.3.11.2  (Beamforming Feedback Matrix V) based on the channel  measured during the training symbols of a previous VHT NDP  PPDU. | MU | | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| CHAN\_MAT\_TYPE | FORMAT is VHT and  PSDU\_LENGTH equals 0 | Set to COMPRESSED\_SV | N | | Y |
| FORMAT is VHT and  PSDU\_LENGTH is  greater than 0 | Not present | N | | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| CHAN\_MAT | FORMAT is VHT and  PSDU\_LENGTH equals 0 | Contains a set of compressed beamforming feedback matrices as  defined in 22.3.11.2 (Beamforming Feedback Matrix V) based  on the channel measured during the training symbols of the  received VHT NDP PPDU. | N | | Y |
| FORMAT is VHT and  PSDU\_LENGTH is  greater than 0 | Not present | N | | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| DELTA\_SNR | FORMAT is VHT | (MU Exclusive Beamforming Report field) based on the channel  measured during the training symbols of the received VHT NDP  PPDU.  NOTE—In the RXVECTOR this parameter is present only for  VHT NDP PPDUs for MU sounding. | MU | | Y |
| Otherwise | Not Present | N | | N |
| RCPI |  | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) |  | |  |
| SNR | FORMAT is VHT | Contains an array of received SNR measurements for each  spatial stream. SNR indications of 8 bits are supported. SNR  shall be the sum of the decibel values of SNR per tone divided by  the number of tones represented in each stream as described in  8.4.1.48 (VHT Compressed Beamforming Report field) | N | | Y |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| NO\_SIG\_EXTN | FORMAT is VHT | Not present | N | | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| FEC\_CODING | FORMAT is VHT | Indicates which FEC encoding is used.  Enumerated type:  BCC\_CODING indicates binary convolutional code.  LDPC\_CODING indicates low-density parity check code. | MU | | Y |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| STBC | FORMAT is VHT | Indicates whether STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.*  This parameter is 0 for a VHT MU PPDU. | Y | | Y |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| GI\_TYPE | FORMAT is VHT | Indicates whether a short guard interval is used in the  transmission of the Data field of the PPDU.  Enumerated type:  LONG\_GI indicates short GI is not used in the Data field of  the PPDU.  SHORT\_GI indicates short GI is used in the Data field of the  PPDU. | Y | | Y |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| TXPWR\_LEVEL | FORMAT is VHT | The allowed values for the TXPWR\_LEVEL parameter are in  the range from 1 to  numberOfOctets(dot11TxPowerLevelExtended)/2. This  parameter is used to indicate which of the available transmit  output power levels defined in dot11TxPowerLevelExtended  shall be used for the current transmission. | Y | | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| RSSI | FORMAT is VHT | 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 VHT-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 |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| MCS | FORMAT is VHT | Indicates the modulation and coding scheme used in the  transmission of the PPDU.  Integer: range 0 to 9 | MU | | Y |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| REC\_MCS | FORMAT is VHT | Indicates the modulation and coding scheme used in the  transmission of the PPDU.  Integer: range 0 to 9 | N | | O |
| Otherwise | Not present | N | | N |
| CH\_BANDWIDTH | FORMAT is HT\_MF or  HT\_GF | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| FORMAT is VHT | Indicates the channel width of the transmitted PPDU:  Enumerated type:  CBW20 for 20 MHz  CBW40 for 40 MHz  CBW80 for 80 MHz  CBW160 for 160 MHz  CBW80+80 for 80+80 MHz | Y | | Y |
| FORMAT is NON\_HT | In TXVECTOR, indicates the channel width of the transmitted  PPDU.  In RXVECTOR, indicates the estimated channel width of the  received PPDU.  Enumerated type:  CBW40, CBW80, CBW160, or CBW80+80 if  NON\_HT\_MODULATION equals  NON\_HT\_DUP\_OFDM  CBW20 if NON\_HT\_MODULATION equals OFDM | Y | | Y |
| DYN\_BANDWIDTH\_IN\_NON\_HT | FORMAT is NON\_HT | In TXVECTOR, if present, indicates whether the transmitter is  capable of Static or Dynamic bandwidth operation.  In RXVECTOR, if valid, indicates whether the transmitter is  capable of Static or Dynamic bandwidth operation.  Enumerated type:  Static if the transmitter is capable of Static bandwidth  operation  Dynamic if the transmitter is capable of Dynamic bandwidth  operation  NOTE—In the RXVECTOR, the validity of this parameter is  determined by the MAC based on the contents of the received  MPDU. | O | | Y |
| Otherwise | Not present | N | | N |
| CH\_BANDWIDTH\_IN\_NON\_HT | FORMAT is NON\_HT | In TXVECTOR, if present, indicates the channel width of the  transmitted PPDU, which is signaled via the scrambling  sequence.  In RXVECTOR, if valid, indicates the channel width of the  received PPDU, which is signaled via the scrambling sequence.  Enumerated type:  CBW20, CBW40, CBW80, CBW160, CBW80+80  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 | N | | N |
| LENGTH | FORMAT is VHT | Not present | N | | N |
| Otherwise | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR parameters) | | | |
| APEP\_LENGTH | FORMAT is VHT | If equal to 0, indicates a VHT NDP PPDU for both RXVECTOR  and TXVECTOR.  If greater than 0 in the TXVECTOR, indicates the number of  octets in the range 1 to 1 048 575 in the A-MPDU pre-EOF  padding (see 9.13.2 (A-MPDU length limit rules)) carried in the  PSDU.  If greater than 0 in the RXVECTOR, this parameter is the value  obtained from the VHT-SIG-B Length field multiplied by 4. | MU | | O |
| Otherwise | Not present | N | | N |
| PSDU\_LENGTH | FORMAT is VHT | Indicates the number of octets in the VHT PSDU in the range of  0 to 1 048 575 octets. A value of 0 indicates a VHT NDP PPDU. | N | | Y |
| Otherwise | Not present | N | | N |
| USER\_POSITITION | FORMAT is VHT and  1 ≤ GROUP\_ID ≤ 62 | Index for user in MU transmission. Integer: range 0-3.  NOTE—The entries in the USER\_POSITION array are in  ascending order. | MU | | O |
| Otherwise | Not present | N | | N |
| NUM\_STS | FORMAT is VHT | Indicates the number of space-time streams.  Integer: range 1-8 for SU, 1-4 per user in the TXVECTOR and 0-  4 in the RXVECTOR for MU.  NUM\_STS summed over all users is in the range 1 to 8. | MU | | Y |
| Otherwise | Not present | N | | N |
| GROUP\_ID | FORMAT is VHT | Indicates the group ID.  Integer: range 0-63 (see Table 22-12 (Fields in the VHT-SIG-A  field))  A value of 0 or 63 indicates a VHT SU PPDU. A value in the  range 1 to 62 indicates a VHT MU PPDU. | Y | | Y |
| Otherwise | Not present | N | | N |
| PARTIAL\_AID | FORMAT is VHT and  GROUP\_ID is 0 or 63 | Provides an abbreviated indication of the intended recipient(s) of  the PSDU (see 9.20 (Group ID and partial AID in VHT  PPDUs)).  Integer: range 0-511. | Y | | Y |
| Otherwise | Not present | N | | N |
| NUM\_USERS | FORMAT is VHT | Indicates the number of users with nonzero space-time streams.  Integer: range 1 to 4. | Y | | N |
| Otherwise | Not present | N | | N |
| BEAMFORMED | FORMAT is VHT and  GROUP\_ID is 0 or 63 | Set to 1 if a beamforming steering matrix is applied to the  waveform in an SU transmission as described in 20.3.11.11.2  (Spatial mapping). Set to 0 otherwise.  NOTE—When BEAMFORMED is set to 1, frequency domain  smoothing as part of channel estimation is not recommended. | Y | | O |
| Otherwise | Not present | N | | N |
| TXOP\_PS\_NOT\_ALLOWED | FORMAT is VHT | Indicates whether a VHT AP allows non-AP VHT STAs in VHT  TXOP power save mode to enter doze state during the TXOP.  0 indicates that the VHT AP allows non-AP VHT STAs to enter  doze state during a TXOP.  1 indicates that the VHT AP does not allow non-AP VHT STAs  to enter doze state during a TXOP. | Y | | Y |
| Otherwise | Not present | N | | N |
| TIME\_OF\_DEPARTURE\_REQUESTED |  |  |  | |  |
|  | See corresponding entry in Table 20-1 (TXVECTOR and RXVECTOR  parameters) | | | |
| RX\_START\_OF\_FRAME\_OFFSET | dot11TimingMsmtActivat  ed is true | 0 to 232– 1. An estimate of the offset (in 10 ns units) from the  point in time at which the start of the preamble corresponding to  the incoming frame arrived at the receive antenna connector to  the point in time at which this primitive is issued to the MAC. | N | | Y |
| Otherwise | Not present | N | | N |
| NOTE 1—In the “TXVECTOR” and “RXVECTOR” columns, the following apply:  Y = Present;  N = Not present;  O = Optional;  MU indicates that the parameter is present once for a VHT SU PPDU and present per user for a VHT MU PPDU.  Parameters specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u*  takes values 0 to NUM\_USERS-1.  NOTE 2—On reception, where valid, the CH\_BANDWIDTH\_IN\_NON\_HT parameter is likely to be a more reliable  indication of subformat and channel width than the NON\_HT\_MODULATION and CH\_BANDWIDTH parameters,  since for non-HT or non-HT duplicate frames, CH\_BANDWIDTH is a receiver estimate of the bandwidth, whereas  CH\_BANDWIDTH\_IN\_NON\_HT is the signaled bandwidth. | | | | | |