IEEE P802.11
Wireless LANs

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| CIDs 8009 and 8013 |
| Date: 2013-02-14 |
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##### This submission presents proposed resolution to CIDs 8009 and 8013. Changes indicated by a mixture of Word track-changes and instructions.

##### CID 8009

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| CID | Commenter | Clause | Page | Line | Comment | Proposed Change |
| 8009 | Yusuke Asai | 13 | 7 | 13 | "MU PPDU" is not defined in TGac Draft. | Replace "MU PPDU" with "VHT MU PPDU" throughout the draft. Ditto P126L35, P127L4, P167L4,P192L56, P193L28,P265L39,P280L9, P280L46, P280L62,P321L1,P385L32, P385L46, P385L59, **P399L13, P399L16, P399L20, P399L33, P399L37, P399L43 and P400L12.** Otherwise, define the term of "MU PPDU". |

***Discussion:***

MU PPDU is defined in Section 3.1 “Definition” as follows:

***multi-user (MU) physical layer protocol data unit (PPDU):*** *A PPDU that carries one or more PSDUs for one or more STAs using the DL-MU-MIMO technique.*

There is also definition on VHT MU PPDU in Section 3.2 “Definitions specific to IEEE 802.11” as follows:

***very high throughput (VHT) multi-user (MU) physical layer protocol data unit (PPDU):*** *A VHT PPDU transmitted with the TXVECTOR parameters FORMAT equal to VHT and GROUP\_ID in the range 1 to 62.*

***Proposed Resolution:***

**Rejected. There is a definition on the term “MU PPDU” in Section 3.1.**

### *Alternative Resolution:*

### Counter. Transfer the CID to TGac Editor because the comment is editorial in nature. Suggested editorial changes are detailed as follows.

***Page 126 Line 35 and Page 127 Line 4:***

As referred to Page 126 Line 35 and Page 127 Line 4, the commenter is right that “MU PPDU” in Figure 9-9a and Figure 9-9b, respectively, should be replaced with “VHT MU PPDU” because the description therein is related to an acknowledgment procedure performed by a STA that receives MPDUs that were transmitted within a VHT MU PPDU.

### TGac Editor: Please replace Figure 9-9a with the following figure:

|  |
| --- |
|  |
| * An example of a TXOP containing a VHT MU PPDU transmission with an immediate acknowledgement to the VHT MU PPDU(#7005)
 |
| TGac Editor: Please replace “MU PPDU” with “VHT MU PPDU” in Figure 9-9b:  |
| * An example of a TXOP containing a VHT MU PPDU transmission with no immediate acknowledgement to the VHT MU PPDU(#7005)
 |

***Page 167 Line 4:***

Referring to Page 167 Line 4, the commenter is right that the term “MU PPDU” should be replaced with “VHT MU PPUD” because the description therein (c.f., Clause 9.30) is related to the transmission of a VHT MU PPDU by an MU beamformer:

### TGac Editor: Please apply the following changes to the last paragraph of Clause 9.29.4:

When transmitting a VHT MU(#MDR) PPDU, an(#MDR) MU Beamformer shall order the per-user arrays of TXVECTOR parameters so that the per-user USER\_POSITION array is in ascending order.(#7262)

***Page 192 Line 56 and Page 193 Line 28:***

Referring to Clause 10.40, it is about Group ID Management operation applied to VHT STA. The text therein uses the terms “MU PPDU” and “VHT MU PPDU” interchangeably. Note here that the term “SU PPDU” in this clause should also be replaced with “VHT SU PPDU”.

### TGac Editor: Please apply the following changes to the first paragraph of Clause 10.40:

An AP determines the possible combinations of STAs that can be addressed by a VHT MU PPDU by assigning STAs to groups and to specific user positions within those groups.(#7126)

### TGac Editor: Please apply the following changes to the nineth paragraph of Clause 10.40:

Group ID values of 0 and 63 are used for VHT SU PPDU and the PHY filtering of such PPDUs is controlled by the PHYCONFIG\_VECTOR primitive LISTEN\_TO\_GID00 and LISTEN\_TO\_GID63 parameters. The User Position in Group ID information is interpreted by a STA receiving a VHT MU PPDU as explained in 22.3.11.4 (Group ID).(#7126)

***Page 265 Line 39:***

Referring to the associated Clause 22.3.8.3.3, it is about the structures of VHT-SIG-A1 and VHT-SIG-A2. The text is specially related to VHT PPDU. Note here that the term “SU PPDUs” should also be replaced with “VHT SU PPDUs”.

### TGac Editor: Please apply the following changes to the second paragraph of Clause 22.3.8.3.3:

The mapping of the fields is also described in Table 22-12 (Fields in the VHT-SIG-A field). Note that the mapping of the NSTS/Partial AID field, the SU/MU[0] Coding field, the SU VHT-MCS/MU[1-3] Coding field, and the Beamformed field is different for VHT SU and MU PPDUs.

***Page 280 Line 9, Line 46, and Line 62:***

As referred to the corresponding Clause 22.3.10.1, it discusses on the data field of VHT PPDU. Throughout the whole clause, “MU PPDU” and “VHT MU PPDU” as well as “PPDU” and “VHT PPDU” are used interchangeably. Note here that the term “SU PPDU” should also be replaced with “VHT SU PPDU”.

As a side remark, there is nothing wrong in Page 280 Line 62. Both “VHT PPDU” and “VHT MU PPDU” are correctly presented.

### TGac Editor: Please apply the following changes to the third paragraph of Clause 22.3.10.1:

The padding flow is as follows. The MAC delivers a PSDU that fills the available octets in the Data field of the VHT PPDU for each user *u*. The PHY determines the number of pad bits to add and appends them to the PSDU. The number of pad bits added will always be 0 to 7 per user. When user *u* of a VHT MU PPDU uses BCC encoding, the number of pad bits is calculated using (22-56). In the case of SU ignore *u* in (22-56).(#7267)

### TGac Editor: Please apply the following changes to the fourth paragraph of Clause 22.3.10.1:

For a VHT SU PPDU, if LDPC encoding is used then(#7059) the PHY padding bits are calculated using (22-57).

### TGac Editor: Please apply the following changes to the fifth paragraph of Clause 22.3.10.1:

For a VHT MU PPDU, if LDPC encoding is used for user *u* then the PHY padding bits are calculated using (22-58).(#7059)

***Page 321 Line 1:***

It is NOTE 1 in Clause 22.3.20 that describes the transmit PHY operation of VHT PPDUs. The term “VHT MU PPDU”, rather than “MU PPDU”, should be used in order to provide a clear differentiation with respect to the transmit procedure for NON\_HT format as described in NOTE 2.

### TGac Editor: Please apply the following changes to NOTE 1 of Clause 22.3.20:

NOTE 1—For a VHT MU PPDU(#MDR) the A-MPDU is per user in the MAC sublayer and the VHT Training Symbols, VHT-SIG-B, and Data are per user in the PHY layer in Figure 22-32 with the number VHT Training Symbols depending on the total number of space-time streams across all users(#7278).

***Page 385 Line 32, Line 46, and Line 59:***

The associated clause in Annex C.3 presents the dot11 Phy VHT TABLE and dot11 VHT Transmit Beamforming table. The term “MU PPDU” described therein is actually “VHT MU PPDU”.

### TGac Editor: Please apply the following changes to the object type “dot11VHTMUMaxUsersImplemented” in Annex C.3:

dot11VHTMUMaxUsersImplemented OBJECT-TYPE

 SYNTAX Unsigned32

 MAX-ACCESS read-only

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

 This attribute indicates the maximum number of users to which this device is capable of transmitting within a VHT MU PPDU."

 DEFVAL { 1 }

 ::= { dot11PhyVHTEntry 15 }

### TGac Editor: Please apply the following changes to the object type “dot11VHTMUMaxNSTSPerUserImplemented” in Annex C.3:

dot11VHTMUMaxNSTSPerUserImplemented OBJECT-TYPE

 SYNTAX Unsigned32

 MAX-ACCESS read-only

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

 This attribute indicates the maximum number of space-time streams per user that this device is capable of transmitting within a VHT MU PPDU."

 DEFVAL { 1 }

 ::= { dot11PhyVHTEntry 16 }

### TGac Editor: Please apply the following changes to the object type “dot11VHTMUMaxNSTSTotalImplemented” in Annex C.3:

dot11VHTMUMaxNSTSTotalImplemented OBJECT-TYPE

 SYNTAX Unsigned32

 MAX-ACCESS read-only

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

 This attribute indicates the maximum number of space-time streams for all users that this device is capable of transmitting within a VHT MU PPDU."

 DEFVAL { 1 }

 ::= { dot11PhyVHTEntry 17 }

***Page 399 Line 16, Line 20, Line 33, Line 37, and Line 43, Page 400 Line 12:***

For the attritubes “mu-ppdu-end”, “mu-user-respond”, and “mu-user-not-respond” in Annex G.1 and G.4, they are related to VHT MU PPDUs.

### TGac Editor: Please apply the following changes to Annex G.1:

|  |
| --- |
| * **Attributes applicable to frame exchange sequence definition**
 |
| **Attribute** | **Description** |
| *a-mpdu* | Frame is part of an A-MPDU aggregate. See NOTE 2. |
| *a-mpdu-end* | Frame is the last frame in an A-MPDU aggregate. See NOTE 2. |
| *mu-ppdu-end* | This attribute delineates the end of a VHT MU PPDU. See NOTE 3 and NOTE 4. |
| *mu-user-respond* | The preceding frame or A-MPDU is part of a VHT MU PPDU and is addressed to a user from which an immediate response is expected. See NOTE 3 and NOTE 4. |
| *mu-user-not-respond* | The preceding frame or A-MPDU is part of a VHT MU PPDU and is addressed to a user from which no immediate response is expected. See NOTE 3 and NOTE 4. |
| NOTE 1—A control frame that contains the HT Control field is always transmitted using the control wrapper frame.NOTE 2—In the case of VHT single MPDU, a single MPDU is carried in a A-MPDU, but the attributes *+a-mpdu* and *+a-mpdu-end* are not used.NOTE 3—*+mu-ppdu-end*, *+mu-user-respond* and *+mu-user-other* are used in productions that generate VHT MU PPDUs, according to the pattern: ["an A-MPDU (which might contain a VHT single MPDU) needing a response" *+mu-user-respond* ] {"an A-MPDU (which might contain a VHT single MPDU) not needing a response" *+mu-user-not-respond*} *+mu-ppdu-end*. There is at least one of *+mu-user-respond* or *+mu-user-not-respond* in a VHT(#MDR) MU PPDU. NOTE 4—In the sequence **A***+mu-user-respond* **B***+mu-user-not-respond* … *+mu-ppdu-end*, although the terms **A**, **B** … (which represent one or more frames) are listed sequentially in these productions, the per-user sequence of frames represented by **A**, **B**, ... are transmitted simultaneously per-user using a VHT MU PPDU. |

### TGac Editor: Please apply the following changes to Annex G.4:

Change the ht-ack-sequence as follows:

(\* The per-user parts of a VHT MU PPDU that do not require a response \*)

##### CID 8013

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| CID | Commenter | Clause | Page | Line | Comment | Proposed Change |
| 8013 | Yusuke Asai | 18.3.5.5 | 214 | 18 | CBW\_IN\_NON\_HT\_TEMP should be replaced with CbwInNonHtTemp according to Table 18-6a. | As in Comment. |

***Discussion:***

CBW\_IN\_NON\_HT\_TEMP is a temporary variable that shall be set to selected bits in the scrambing sequence as shown in Table 18-6a, followed by mapping to the RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT as shown in Table 18-6c. Throughout the Draft D5.0, both “CBW\_IN\_NON\_HT\_TEMP” and “CbwInNonHtTemp” are used interchangeably that may cause confusion to readers that these are two different variables.

***Proposed Resolution:***

**Rejected.** Throughout the Draft D5.0, both “CBW\_IN\_NON\_HT\_TEMP” and “CbwInNonHtTemp” are used interchangeably.

***Alternative Resolution:***

### Counter. The comment is editorial in nature. Transfer this CID to TGac editor with the following suggested editorial change.

### TGac Editor: Please apply the following editorial changes in Table 18-6a:

|  |
| --- |
| * Contents of the first 7 bits of the Scrambling Sequence
 |
| Parameter | Condition | First 7 bits of Scrambling Sequence |
| **B0 B3** | **B4** | **B5 B6** |
| Transmit order |
| TXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT is present and DYN\_BANDWIDTH\_IN\_NOT\_HT is not present in TXVECTOR | 5-bit pseudo-random nonzero integer if CH\_BANDWIDTH\_IN\_NON\_HT equals CBW20 and a 5-bit pseudo-random integer otherwise | CH\_BANDWIDTH\_IN\_NON\_HT |
| TXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT is present and DYN\_BANDWIDTH\_IN\_NOT\_HT is present in TXVECTOR | 4-bit pseudo-random nonzero integer if CH\_BANDWIDTH\_IN\_NON\_HT equals CBW20 and DYN\_BANDWIDTH\_IN\_NON\_HT equals Static, and a 4-bit pseudo-random integer otherwise | DYN\_BANDWIDTH\_IN\_NON\_HT |
| RXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NOT\_HT are present in RXVECTOR | - | DYN\_BANDWIDTH\_IN\_NON\_HT | CBW\_IN\_NON\_HT\_TEMP is set to this subfield of First 7 bits of Scrambling Sequence, then CBW\_IN\_NON\_HT\_TEMP is mapped according to Table 18-6c to CH\_BANDWIDTH\_IN\_NON\_HT(#7170) |