IEEE P802.11  
Wireless LANs

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| Resolutions for Misc CIDs | | | | |
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Abstract

This document provides resolution for the comments listed below

Comments are from: 11-11-0276-09-00ac-tgac-d0-1-comments.xls

Comments refer to: Draft P802.11ac\_D0.1.pdf

Changes in the text refer to: Draft P802.11ac\_D0.3.pdf

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| 765 | Liu, Yong | Marvell | 7.2.3.1 | Modify the notes to the HT Capabilities element and HT Operation element with "the HT Capabilities element / HT Operation element is present when the dot11VHTOptionImplemented attribute is true" | AGREE.  See changes below. |

***Editor: Please add the following sentence***

**10.24 VHT BSS operation**

**10.24.1 Basic VHT BSS functionality**

A STA that has a value of true for dot11VHTOptionImplemented shall set dot11HighThroughputOptionImplemented to true.

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| 1014 | Seok, Yongho | LG Electronics | 7.3.1.11 | TBD for Robust | Further specification required. |
| 142 | Banerjea, Raja | Marvell Semiconductor | 7.3.1.11 | VHT Action Management packets contain time critical information, so they should not be Robut Action Management Packets. | Change Robust value from TBD to No. |
| 701 | Kneckt, Jarkko | Nokia Corporation | 7.3.1.11 | TBD should not exists in the standard | Define appropriate value for TBD fields. |
| 1583 | Zhu, Chunhui | Samsung Electronics | 7.3.1.11 | Robust field is TBD | resolve TBDs |
| 1154 | Stacey, Robert | Intel | 7.4.12.3 | The Group ID management frame needs to be classified for management frame encryption. | Since this is a real-time frame - table update is immediate on receipt of the frame - the frame should be classified as non-encrypted. |
| 1047 | Seok, Yongho | LG Electronics | 7.4.12.3 | TBD whether the action frame is "robust". TBD on the location of the field. | Define details. |

**Discussion: Agree in principle**

***Editor: Please make the following change***

**8.4 Management frame body components**

**8.4.1 Fields that are not information elements**

**8.4.1.11 Action field**

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| **Code** | **Meaning** | **See subclasue** | **Robust** |
| **<ANA>** | **VHT** | **8.5.16 (VHT Action frame details)** | **~~TBD~~No** |

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| 774 | Liu, Yong | 9.2.0b.4.2 | A VHT STA shall set the RIFS capability bit to 0 | as comment |

**Discussion: Disagree**

**There is already a sentence in 10.24.1 saying:**

The use of RIFS in a VHT BSS is deprecated. As such, a VHT AP shall set the RIFS Mode field in the HT

Operation element to 0.

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| 1488 | Lv, Kaiying | 9.21.6 | When a STA transmits a VHT format NDP，TXVECTOR parameters STBC shall be set to 0 | On line 13,add"STBC shall be set to 0" |

**Discussion: Disagree**

Different from 11n NDP (where STBC=0 is required), in VHT NDP the number of space-time streams is explicitly indicated by NUM\_STS. No need to fix the setting of STBC for NDP.

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| 1196 | Stephens, Adrian | Intel Corporation | 9.21.6 | "the STA that is the intended recipient of the VHT NDP." - this does not allow for the MU case | Describe the MU case |

**Discussion: Agree in principle**

***Editor: Please make the following change in 9.30.6***

**9.30.6 Transmission of a VHT NDP**

The number of space-time(#1082) streams sounded and as indicated by the NUM\_STS parameter shall not exceed the value indicated in the Compressed Steering Number of Beamformer Antennas Supported field in the VHT Capability element of ~~the~~ any STA that is the intended recipient or one of the intended recipients of the VHT NDP frame(#1084).

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| 158 | Carney, Bill | 9.7d.6 | Clarify whether the padding is only inserted at the end of the AMPDU or if it can be dispersed/distributed and if so, how. | Clarify/specify. |

**Discussion: Agree in principle**

***Editor: Please make the following changes***

**7.4a Aggregate MPDU (A-MPDU)**

**7.4a.1 A-MPDU format**

**Table 8-235—MPDU delimiter fields**

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| **Field** | **Size (bits)** | **See subclasue** |
| EOF | 1 | End of Frame indication.  Set to 1 in all ~~zero length~~ A-MPDU subframes with MPDU Length 0 ~~following the last non-zero length A-MPDU subframe~~ that are used to pad an A-MPDU in a VHT PPDU as described in 9.12.6.  May be set to 1 in ~~a single A-MPDU subframe of non-zero length~~ the delimiter associated with a VHT single MPDU as described in ~~9.7d.7~~ 9.12.7.  Set to 0 otherwise. |

**9.12.6 A-MPDU padding for VHT format PPDU**

A VHT STA that delivers an A-MPDU to the PHY (using PHY-DATA.request primitives) as the PSDU for a VHT format PPDU shall pad the A-MPDU as described in this subclause. An A-MPDU pre-EOF padding (see 9.12.2) is constructed from the MPDUs available for transmission and meeting the A-MPDU content, length limit and MPDU start spacing constraints. The length of the resulting A-MPDU pre-EOF padding, A-MPDU\_Length, is used as the LENGTH parameter in the PLME-TXTIME.request (see 10.4.6) primitive and in the MAC padding procedure of this subclause. The PLME-TXTIME.confirm (see 10.4.7) primitive provides the TXTIME and PSDU\_LENGTH parameters for the transmission. Padding is then added to the A-MPDU such that the resulting A-MPDU contains exactly PSDU\_LENGTH octets.

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An A-MPDU subframe with EOF set to 1 and with MPDU Length set to 0 shall not be added before any A-MPDU subframe with EOF set to 0.

An A-MPDU subframe with EOF set to 1 and with MPDU Length set to 0 shall not be added before a non-zero length A-MPDU subframe with the EOF field set to 1 in a VHT single MPDU (see 9.12.7).

An EOF pad shall not be added before any A-MPDU subframe.

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| 161 | Chu, Liwen | 7.4a.3 | Why do you need to put a RTS/CTS/ACK etc… in A-MDPU in single MPDU context? One possible use that I can imagine is carrying VHTC field. But Control wrapper frame can be used to carry VHTC field. It should be single data MPDU or MMPDU. | Change to Any single data MPDU/MMPDU |

**Discussion: Disagree.**

Don’t see why we need to disallow control frames from using VHT PPDU format.

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| 162 | Chu, Liwen | 7.4a.3 | Again, why do you need to put a RTS/CTS/ACK etc… in A-MDPU in MU MPDU context?  Data MPDUs will be part of this kind of A-MPDU. Does 11ac still allow to use Action no ACK frame? If the answer is yes, it should be part of this kind of A-MPDU. If the answe is no, it should not be part of this kind of A-MPDU. And the table "Data Enabled Immediate Response", "Data Enabled No Immediate Response", "Control Response" should also be changed by removing Action no ACK items. | Change to Any data MPDUs / Action no ACK |

**Discussion: Disagree.**

Don’t see why we need to disallow control frames from using VHT PPDU and MU PPDU format.

Note that a MU PPDU can include one VHT Single MPDU, which can contain any MPDU.

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| 1270 | Stephens, Adrian | 7.4a.3 | "At most one A-MPDU in the MU PPDU is allowed to contain one or more MPDUs that" - this is too broad, for example, it would allow an RTS to be aggregated. solicit an immediate response | Replace with the following: "The multi-user PPDU consists of at multiple A-MPDUs, each directed to a different user. At most one of these A-MPDUs generates an immediate response, and its contents are described in Table 7-57z. The remaining A-MPDUs generate no immediate response, and their contents are described in Table 7-57aa." Delete the "Any MPDU" to the left. |

**Discussion: Disagree.**

A MU PPDU can include one VHT Single MPDU, which is not limited by the A-MPDU contents in Table 7-57z and 7-57aa.

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| 1515 | RISON, Mark | various | The treatment of VHT single MPDUs is ambiguous/inconsistent. There are two fundamental questions:  1) Is a "VHT single MPDU" considered to be a type of A-MPDU or is it considered to be a non-A-MPDU?  2) May a "VHT single MPDU" contain zero-length MPDUs? If an A-MPDU "contains a single MPDU of non-zero length.", is that to be interpreted as "contains a single MPDU of non-zero length, and nothing else", or "contains a single MPDU of non-zero length, and any number (including zero) of MPDUs of zero length"?  There are three subsidiary questions:  3) Is a "VHT single MPDU" the MPDU itself, or the VHT (non-?)A-MPDU which contains it?  4) Does "an A-MPDU subframe of zero length" actually mean an A-MPDU subframe whose MPDU Length field contains a value of 0 (i.e. the A-MPDU subframe length is actually 4)?  5) Does an A-MPDU subframe with an MPDU Length field of 0 contain a zero-length MPDU, or not contain an MPDU at all?  Below are some quotes from the draft showing the confusion, for reference:  3.2 says that a non-A-MPDU includes:  a frame that is transmitted as a VHT single MPDU.  3.2 says that a VHT single MPDU is:  An MPDU that is the only MPDU carried in an A-MPDU carried in a VHT PPDU, and with the EOF subfield of the MPDU delimiter field equal to 1.  7.4a.1 says of the EOF bit that it is:  Set to 1 in all zero length A-MPDU subframes following the last non-zero length A-MPDU subframe in a VHT PPDU. May be set to 1 in a single A-MPDU subframe of non-zero length as described in 9.7d.7.  7.4a.3 says that:  An A-MPDU is a sequence of MPDUs carried in a single PPDU either with FORMAT set to VHT [...]  Table 7-57x says that the VHT single MPDU context is when:  The A-MPDU contains a single MPDU of non-zero length.  Table 7-57ab1 describes this context as:  Any single MPDU. The delimiter preceding the MPDU has the EOF field set to 1.  9.1.5, 9.6 and 9.9.1.2 talk of:  an A-MPDU that is not a VHT single MPDU [...]  9.7d.7 states that:  An MPDU contained within an A-MPDU that contains a single non-zero length A-MPDU subframe with the EOF field set to 1 is called a VHT single MPDU.  The EOF field in the non-zero length A-MPDU subframe of an A-MPDU that carries a single non-zero length A-MPDU subframe may be set to 1.  9.15 talks of:  a non-A-MPDU frame or a VHT single MPDU non-A-MPDU frame or VHT single MPDU | Answer the five questions posed and then update the spec accordingly. |

**Discussion: Agree in principle.**

*1) Is a "VHT single MPDU" considered to be a type of A-MPDU or is it considered to be a non-AMPDU?*

A: VHT single MPDU uses a special A-MPDU format, but is considered to be a non-AMPDU.

*2) May a "VHT single MPDU" contain zero-length MPDUs? If an A-MPDU "contains a single MPDU of non-zero length.", is that to be interpreted as "contains a single MPDU of non-zero length, and nothing else", or "contains a single MPDU of non-zero length, and any number (including zero) of MPDUs of zero length"?*

A: It means "contains a single MPDU of non-zero length, and any number (including zero) of A-MPDU subframes with MPDU Length 0".

*3) Is a "VHT single MPDU" the MPDU itself, or the VHT (non-?)A-MPDU which contains it?*

A: the MPDU itself.

*4) Does "an A-MPDU subframe of zero length" actually mean an A-MPDU subframe whose MPDU Length field contains a value of 0 (i.e. the A-MPDU subframe length is actually 4)?*

A: Yes.

*5) Does an A-MPDU subframe with an MPDU Length field of 0 contain a zero-length MPDU, or not contain an MPDU at all?*

A: Does not contain an MPDU at all.

***Editor: Please change all “non-zero length A-MPDU subframe” to “A-MPDU subframe with non-zero MPDU Length value”. Check other usage of “non-zero length” and make appropriate changes.***

***Editor: Please change all “an A-MPDU that is not a VHT single MPDU” to “an A-MPDU that does not contain a VHT single MPDU”.***