IEEE P802.11  
Wireless LANs

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| TGac SB 01 Comment Resolution – Osama. | | | | |
| Date: 2013-05-12 | | | | |
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Abstract

This submission included proposed resolutions to CIDs, 10142, 10183, 10244, 10245, 10246, 10247, 10248, 10311, and 10312.

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| CID |  |  | Comment | Proposed Resolution | Resolution |
| 10142 | 365.27 | B4.23.2 | LDPC is a significant coding efficiency improvement over legacy coding techniques when errors are present. The WLAN industry needs to endorse efficiency improvements when available. The WLAN industry needs to make this coding techniques mandatory ASAP | Change LDPC from Optional to Mandatory | Rejected: Mandating LDPC affects backward compatability with other WLAN devices operating in the 5 GHz band. Bacward compatability is a VHT PAR requirement. |

Discussion:

LDPC coding is optional feature in both HT and VHT devices. This is consistent with the statement that a VHT device is also an HT device. Mandating LDPC in VHT breaks backward compatability with some of HT devices. Furthermore the coding efficiency can always be realized by implementing the optional LDPC feature in scenarios where its full benefits can be achieved.

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| 10183 | 145.61 | 9.12.8 | What is the reason for defining this special case within an A-MPDU? Seems to have more defects than merits. | Delete VHT single MPDUs throughout the draft. Or explain enough reason. | Rejected: the commenter need to provide more information related to the defects he identified. See also discussion in <this document> |

Discussion:

The commenter didn’t provide sufficient information related to his statement; “Seems to have more defects than merits” for the group to address his concerns. Since VHT PPDU always carries frames in A-MPDU format, it is necessary to define a compatible format when a single MPDU is transmitted. The use of A-MPDU format was mandated in VHT since the MPDU Delimiter includes information that is not available anywhere else in the VHT PPDU header.

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| 10244 | 10.12 | 4.3.10a | This statement about VHT bands specifically includes the < 1 GHz, 3 GHz and 4 GHz bands. Are any of these real possibilities? Why not just say "in the 5 GHz band"? | Replace "in frequency bands below 6 GHz excluding the 2.4 GHz band" with "in the 5 GHz frequency band". | Rejected: The sentence is is copied from the VHT PAR and is factually correct. While the current specs describe only operation in the 5GHz band, there is no fundamental reason why a later amendment shouldn’t change this. |

Discussion:

The sentence is is copied from the VHT PAR and is factually correct. While the current cpecs describes only operation in the 5GHz band, there is no fundamental reason why a later amendment shouldn’t change this. For example P802.11af is applying VHT PHY spec for operation in the white spaces.

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| 10245 | 10.16 | 4.3.10a | Clause 4 is an \_introduction\_, not a table of contents, nor a dictionary. | Replace: "that, in addition to features supported as an HT STA, supports VHT features identified in Clause 8, Clause 9, Clause 10, Clause 13, Clause 18 and Clause 22." with "that supports an additional set of features, called 'VHT features'." | Revised: see changes in <this document> |
| 10246 | 10.18 | 4.3.10a | Statements of "optional" and "mandatory" are normative and are treated normatively in the IEEE 802.11 standard. So they do not belong in an introductory clause. Shorter paragraphs can include all of the relevant introductory information. | Replace the PHY list: "are the following: -- Mandatory ... MCSs 8 and 9." with: "are support for 40 and 80 MHz channel widths and VHT single user (SU) PPDUs, as well as potential support for 160 and 80+80 MHz channel widths, the beamforming sounding protocol, multi-user (MU) PPDUs, and VHT MCSs 8 and 9." Replace the MAC list (beginning on line 29): "are the following: -- Mandatory ... link adaptation." with: "are support for A-MPDU padding of a PPDU, the VHT single MPDU, response to a bandwidth indication in non-HT and non-HT duplicate RTS frames, as well as potential support for MPDUs of up to 11 454 octets, A-MPDU pre-end-of-frame (pre-EOF) padding up to 1 048 575 octets, and VHT link adaptation." | Revised: see changes in <this document> |
| 10247 | 10.29 | 4.3.10a | Assuming the validity of the very tenuous claim that stating "mandatory" is not stating a requirement, the point remains: where are the actual VHT MAC requirements and permissions stated? | Create a new paragraph in 9.2.1 that directly specifies the normative VHT MAC statements (with "shall" in place of "mandatory" and "may" in place of "optional"). | Revised: see changes in <this document> |
| 10248 | 10.65 | 4.3.10a | "is not permitted" is a normative statement, but this is an informative clause (and this is not a statement describing what some other standard permits -- it a normative specification of VHT STA operation). | Replace "The use of certain" with "Certain" and replace "is not permitted for STAs operating as VHT STAs." with "are not used in VHT STAs." | Revised: see changes in <this document> |

Discussion: The commenter is correct in observing that is an introduction and is intended to provide an table of contents or a dictionary. The commenter is also correct in observing that normative language was used in an introductory clause.

**Proposed Changes**

The IEEE 802.11 VHT STA operates in frequency bands below 6 GHz excluding the 2.4 GHz band.

A VHT STA is an HT STA that, in addition to features supported as an HT STA, supports VHT features identified in Clause 8, Clause 9, Clause 10, Clause 13, Clause 18 and Clause 22. The main PHY features in a VHT STA that are not present in an HT STA are the following:

— PPDUs may be transmitted with 80 MHz, and 160 (contiguous and non contiguous) MHz.

— VHT sounding protocol to support beamforming

— VHT multi-user (MU) PPDUs

— VHT-MCSs 8 and 9

The main MAC features in a VHT STA that are not present in an HT STA are the following:

— A-MPDU padding of a VHT PPDU

—VHT single MPDU

— Bandwidth indication (provided by the TXVECTOR and RXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT) in a non-HT and

non-HT duplicate CTS and RTS frame

— MPDU lengths of up to 11 454 octets

— A-MPDU pre-end-of-frame (pre-EOF) padding (see 9.12.2 (A-MPDU length

limit rules)) of length up to 1 048 575 octets

— VHT link adaptation

Most VHT features, among other benefits, increase the maximum throughput achievable between two VHT

STAs over that achievable using HT features alone. The VHT features are available to VHT STAs associated

with a VHT AP in a BSS. A subset of the VHT features is available for use between two VHT STAs that are

members of the same IBSS. Similarly, a subset of the VHT features is available for use between two VHT

STAs that have established mesh peering. A subset of the VHT features is available for use between two VHT

STAs that have established a TDLS link.

The support for VHT transmit beamforming sounding and VHT MU PPDUs in a VHT AP and more than one

VHT STA within a VHT BSS enables the use of downlink MU multiple input, multiple output (DL MU-

MIMO). With DL-MU-MIMO the AP can create up to four A-MPDUs each carrying MPDUs destined

for an associated MU capable STA. The AP uses group identifiers (GIDs) to signal potential recipient STAs.

The AP transmits the A-MPDUs simultaneously in separate space-time streams such that each recipient STA

is able to demodulate the space-time streams carrying its A-MPDU. The simultaneous transmission of A-MPDUs

in a single VHT MU PPDU provides a means to increase aggregate throughput over that achieved by

sending the A-MPDUs in separate SU PPDUs.

The use of certain HT features, such as RIFS, is not permitted for STAs operating as VHT STAs

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| 10311 | 142.56 | 9.12.2 | "limits the LENGTH field ... to 4095." Wow: a 4095 octet LENGTH field doesn't seem like much of a limitation. | Replace "the LENGTH field in the L-SIG field of a VHT PPDU" with "the maximum value in the LENGTH subfield of the VHT PPDU L-SIG field" | Accepted. |

NOTE—This restriction limits the maximum value in the LENGTH subfield of the the VHT PPDU L-SIG field to 4095.

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| 10312 | 143.30 | 9.12.4 | Many of the changes being made here to the 11mc text are not marked as changes. Some seem to be unintentional and some can be made clearer. | Mark the changes being made to the 11mc "NOTE--", but also: a. Do not add the "1" to the 11mc NOTE. b. Do restore the missing "An" before "HT AP". c. Do not insert NOTE 2, but instead add the following sentence after the sentence in the 11mc NOTE: "Since a VHT STA is an HT STA, the VHT AP and VHT mesh STA can also transmit an A-MPDU containing an MPDU that has a group addressed RA." | Accepted |

**References:**