IEEE P802.11
Wireless LANs

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| LB188 Annex B Comment Resolution |
| Date: 2012-12-09 |
| Author(s): |
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|  |  |  |  |  |

Abstract

This submission includes proposed resolutions for CIDs, 6068, 6135, 6136, 6137, 6138, 6139, 6140, 6141, 6142, 6143, 6161, 6162, 6163, 6164, 6165, 6166, 6438.

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| 6068 | 323.31 | 31 | B | In the PICS, VHTM12 doesn't comprehend that a non-VHT STA can implement this feature. | Move VHTM12 to B.4.4.1 and rename/renumber accordingly.Change the Status of the old VHTM12.1 to "O".Change the Status of the old VHTM12.2 to "O<linefeed>CF29:M" |

Proposed Resolution: Accepted

Context:

*From 8.5.23.4*

The Operating Mode Notification frame is an Action frame of category VHT. It is used to notify STAs that the transmitting STA is changing its operating channel width, the maximum number of spatial streams it can receive, or both. The Operating Mode Notification frame is an Action frame of category VHT. It is used to notify STAs that the transmitting STA is changing its operating channel width, the maximum number of spatial streams it can receive, or both.

Discussion:

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| 6135 | 319.15 | B4.4.1 | A SU beamformer doesn't have to implement Beamforming Report Poll. | Change to "VHTM4.1:O" |

Proposed Resolution: Revised

Context:

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| --- | --- | --- | --- | --- |
| Item | MAC frame | References | Status | Support |
|  | Is transmission of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FT27 | VHT NDP Announcement(#4921) | Clause 8 | VHTM4.1:M(#4850) | Yes  No  N/A  |
| FT28 | Beamforming Report Poll | Clause 8 | VHTM4.1:M(#4850) | Yes  No  N/A  |
|  | Is reception of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FR27 | VHT NDP Announcement(#4921) | Clause 8 | VHTM4.2:M(#4850) | Yes  No  N/A  |
| FR28 | Beamforming Report Poll | Clause 8 | VHTM4.2:M(#4850) | Yes  No  N/A  |

Discussion: In addition to the changes proposed by the commenter, there is the need to account for MU Beamformer.

Proposed Changes:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | MAC frame | References | Status | Support |
|  | Is transmission of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FT27 | VHT NDP Announcement(#4921) | Clause 8 | VHTM4.1:M(#4850) | Yes  No  N/A  |
| FT28 | Beamforming Report Poll | Clause 8 | VHTM4.1:OVHTM4.3:M(#4850) | Yes  No  N/A  |
|  | Is reception of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FR27 | VHT NDP Announcement(#4921) | Clause 8 | VHTM4.2:M(#4850) | Yes  No  N/A  |
| FR28 | Beamforming Report Poll | Clause 8 | VHTM4.2:M(#4850) | Yes  No  N/A  |

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| 6136 | 319.23 | B4.4.1 | A SU beamformee doesn't have to implement Beamforming Report Poll. | Change to "VHTM4.2:O" |

Proposed Resolution: Revised

Context: as in CID 6135

Discussion: In addititon to the changes requested by the commenter, there is the need to account for the case of MU Beamformee.

Proposed Changes

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| --- | --- | --- | --- | --- |
| Item | MAC frame | References | Status | Support |
|  | Is transmission of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FT27 | VHT NDP Announcement(#4921) | Clause 8 | VHTM4.1:M(#4850) | Yes  No  N/A  |
| FT28 | Beamforming Report Poll | Clause 8 | VHTM4.1:M(#4850) | Yes  No  N/A  |
|  | Is reception of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FR27 | VHT NDP Announcement(#4921) | Clause 8 | VHTM4.2:M(#4850) | Yes  No  N/A  |
| FR28 | Beamforming Report Poll | Clause 8 | VHTM4.2:OVHTM4.4:M(#4850) | Yes  No  N/A  |

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| 6137 | 319.03 | B4.4.1 | Why are MU beamformer and MU beamforme missing from here? | Clarify it. |

Proposed Resolution: Revised

Context: as in CID 6135 and 6136

Proposed Changes: See resolutions to CIDs 6135 and 6136.

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| 6138 | 321.19 | B4.23.1 | This is not right. A STA in independent BSS or a mesh STA can also transmit beacon etc. | Harmonize with STAs in independent BSS and mesh STAs. |

Proposed Resolution: Revised

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VHTM1 | VHT capabilities signaling |  |  |  |
| VHTM1.1 | VHT capabilities element | 8.4.2.160.1 (VHT Capabilities element structure) | CF29:M | Yes  No  N/A  |
| VHTM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 8.4.2.160.1 (VHT Capabilities element structure), 8.3.3.9 (Probe Request frame format), 8.3.3.5 (Association Request frame format), 8.3.3.7 (Reassociation Request frame format) | (CF29 AND CF2):M(#5460)(#4856) | Yes  No  N/A  |
| VHTM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 8.4.2.160 (VHT Capabilities element), 8.3.3.2 (Beacon frame format), 8.3.3.10 (Probe Response frame format), 8.3.3.6 (Association Response frame format), 8.3.3.8 (Reassociation Response frame format) | (CF29 AND CF1):M(#4856) | Yes  No  N/A  |

Discussion:

As the commenter indicated, Mesh STA supports Beacon, Probe Request/Response, etc. Mesh STA relies on these frames for mesh discovery as mentioned in Cluase 4.13.5.15.2 of IEEE 802.11-2012. In Cluse 13.2.4 a VHT mesh STAs must have identica VHTBSSBasicMCSSet parameters, information that is available in VHT capabilities.

Proposed Chnages:

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| --- | --- | --- | --- | --- |
| VHTM1 | VHT capabilities signaling |  |  |  |
| VHTM1.1 | VHT capabilities element | 8.4.2.160.1 (VHT Capabilities element structure) | CF29:M | Yes  No  N/A  |
| VHTM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 8.4.2.160.1 (VHT Capabilities element structure), 8.3.3.9 (Probe Request frame format), 8.3.3.5 (Association Request frame format), 8.3.3.7 (Reassociation Request frame format) | (CF29 AND CF2):M(CF29 AND CF21):M(#5460)(#4856) | Yes  No  N/A  |
| VHTM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 8.4.2.160 (VHT Capabilities element), 8.3.3.2 (Beacon frame format), 8.3.3.10 (Probe Response frame format), 8.3.3.6 (Association Response frame format), 8.3.3.8 (Reassociation Response frame format) | (CF29 AND CF1):M(CF29 AND CF21):M(#4856) | Yes  No  N/A  |

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| 6139 | 321.37 | B4.23.1 | This is not right. A STA in independent BSS, a TDLS peer STA or a mesh STA can also transmit VHT operation etc. | Harmonize with STAs in independent BSS, TDLS peer STA and mesh STAs. |

Proposed Resolution: Rejected

Context:

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| --- | --- | --- | --- | --- |
| VHTM2 | Signaling of VHT operation | 8.4.2.161 (VHT Operation element) | (CF29 AND CF1):M | Yes  No  N/A  |

Discussion:

*From Clause 8.4.2.161,*

 “The operation of VHT STAs in the BSS is controlled by the HT Operation element and the VHT Operation element”

It indicates that the VHT Operation element is used to control the operation of VHT STAs in BSS and doesn’t address MBSS or TDLS arrangement. For example in an MBSS all Mesh STAs needs to support the same VHTBsicBSSMCSSet and there is no need to exchange VHT operating elements between Mesh STA.

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| 6140 | 323.13 | B4.23.1 | To make it accurate, it is better to add AP/STA identifier (CF1, CF2, CF2.1 etc.). | As in comment |

Proposed Resolution: Rejected

Context:

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| --- | --- | --- | --- | --- |
| VHTM9 | Group ID |  |  |  |
| VHTM9.1 | Transmission of Group ID Management frame | 8.5.23.3 (Group ID Management frame format) | VHTM4.3:M(#4129) | Yes  No  N/A  |
| VHTM9.2 | Reception of Group ID Management frame | 8.5.23.3 (Group ID Management frame format) | VHTM4.4:M(#4129) |  |

Discussion:

VHTM4.3 and VHTM4.4 includes the desired references proposed by the commenter. Therefore the dependencies proposed by the commnter are already included.

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| 6141 | 323.18 | B4.23.1 | To make it accurate, it is better to add AP/STA identifier (CF1, CF2, CF2.1 etc.). | As in comment |

Proposed resolution: Rejected

Context: as in CID 6140

Discussion: See CID 6140.

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| 6142 | 323.23 | B4.23.1 | This is not right. Transmitting dynamic bandwidth signaling is not mandatory. | As in comment |

Proposed Resolution: Revised

Context:

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| --- | --- | --- | --- | --- |
| VHTM10 | Support for NON-HT channel bandwidth and static/dynamic signaling | 10.39.4 (NAV assertion in a VHT BSS) | CF29:M | Yes  No  N/A  |

*From Clause 9.3.2.5a*

“A VHT STA transmitting an RTS frame carried in non-HT or non-HT duplicate format and addressed to a VHT STA **shall** set the TA field to a bandwidth signaling TA and shall set the TXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT and CH\_BANDWIDTH to the same value. If the STA sending the RTS frame is capable of dynamic bandwidth operation (see 9.3.2.6 (CTS and DMG CTS procedure)), it shall set the TXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT to Dynamic. Otherwise, the STA shall set the TXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT to Static.”

Which indicates that VHT STAs are mandated to set the TA field to a BW signalling TA. However it seems that reference in the PICS table is not correct. The reference should be 9.3.2.5a.

Proposed Changes:

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| VHTM10 | Support for NON-HT channel bandwidth and static/dynamic signaling | 9.3.2.5a (VHT RTS Procedure)  | CF29:M | Yes  No  N/A  |

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| 6143 | 323.61 | B4.23.1 | This not right. A mesh can also transmit Extended BSS Load element. | As in comment |

Proposed Resolution: Rejected

Context:

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| VHTM14 | Extended BSS Load Element | 8.4.2.162 (Extended BSS Load element) | CF29:O | Yes  No  N/A  |

*From 8.4.2.162*

“The Extended BSS Load element reported by the AP contains information on bandwidth utilization and MIMO spatial stream underutilization by MU capable STAs”

As implied by its name, this load element is intended for use in a BSS and is sent by the AP. It may or may not be applicable to MBSS. For instance, it is not clear who in a MBSS will be responsible for generating the element. The commenter is encouraged to submit a proposal for how the element is applicable to MBSS.

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| 6161 | 326.11 | B.4.23.2 | Change to VHTP3.4:O since if 80+80MHz Operation is supported, 160MHz operation must be supported. | As in comment |

Proposed Resolution: Revised

Context:

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| --- | --- | --- | --- | --- |
| VHTP3.4 | 160 MHz operation | 10.39.1 (Basic VHT BSS functionality) | CF29:O | Yes  No  N/A  |
| VHTP3.5 | 80+80 MHz operation | 10.39.1 (Basic VHT BSS functionality) | CF29:O | Yes  No  N/A  |

Discussion: The observation by the commenter is correct. It is not clear if one operation depends on the other.

Proposed Changes:

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| VHTP3.4 | 160 MHz and 80+80 MHz operation  | 10.39.1 (Basic VHT BSS functionality) | CF29:O | Yes  No  N/A  |
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| VHTM8.2 | Use of secondary 80 MHz channels for 160 and 80+80 MHz | 10.39.1 (Basic VHT BSS functionality) | VHTP3.4:M | Yes  No  N/A  |

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| VHTM8.4 | CCA on secondary 80 MHz channels for 160 and 80+80 MHz | 10.39.4 (NAV assertion in a VHT BSS) | VHTP3.4):M | Yes  No  N/A  |

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| VHTP5.4 | Values in 160 MHz channel | 22.3.6 (Timing-related parameters) | VHTP3.4:M | Yes  No  N/A  |
| VHTP5.5 | Values in 80+80 MHz channel | 22.3.6 (Timing-related parameters) | VHTP3.4:M | Yes  No  N/A  |

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| VHTP8.3 | CBW80+80(#4743) | 22.5 (Parameters for VHT MCSs) |  |  |
| VHTP8.3.1 | MCS with Index 0-7 and *NSS* = 1 | 22.5 (Parameters for VHT MCSs) | VHTP3.4:M | Yes  No  N/A  |

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| 6162 | 326.15 | B.4.23.2 | Dynamic bandwidth negotiation transmission is not mandatory feature in 11ac. | fix the problem. |

Proposed Resolution: Rejected

Context:

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| VHTP4 | Bandwidth indication | 18.3.5.5 (PLCP DATA scrambler and descrambler) | CF29:M | Yes  No  N/A  |

Discussion: See discussion related to CID 6142 in this document.

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| 6163 | 321.36 | B.4.23.1 | Why are management frames for VHT Capabilities element listed for VHT1.2, VHT1.3 and management frames for VHT operation element not listed as VHTM2.1 etc.? | Clarify it. |

Proposed Change: Rejected

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VHTM1 | VHT capabilities signaling |  |  |  |
| VHTM1.1 | VHT capabilities element | 8.4.2.160.1 (VHT Capabilities element structure) | CF29:M | Yes  No  N/A  |
| VHTM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 8.4.2.160.1 (VHT Capabilities element structure), 8.3.3.9 (Probe Request frame format), 8.3.3.5 (Association Request frame format), 8.3.3.7 (Reassociation Request frame format) | (CF29 AND CF2):M(#5460)(#4856) | Yes  No  N/A  |
| VHTM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 8.4.2.160 (VHT Capabilities element), 8.3.3.2 (Beacon frame format), 8.3.3.10 (Probe Response frame format), 8.3.3.6 (Association Response frame format), 8.3.3.8 (Reassociation Response frame format) | (CF29 AND CF1):M(#4856) | Yes  No  N/A  |
| VHTM2 | Signaling of VHT operation | 8.4.2.161 (VHT Operation element) | (CF29 AND CF1):M | Yes  No  N/A  |

Discussion:

I cannot find any partuclar reason why those relevant management frames are not explicitly listed in VHTM2, other than they will be replica of these frames in VHTM1.3.

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| 6164 | 319.52 | B4.12 | CF2 AND CF2.2 makes no sense since if CF2.2 is true, CF2 must be true. | fix the problem. |

Proposed Resolution: Rejected

Context:

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| --- | --- | --- | --- | --- |
| SM20.4(#4252) | Transmission of channel wrapper element and procedures in conjunction with channel switch announcement or extended channel switch announcement | 10.39.1 (Basic VHT BSS functionality) | (CF1 OR (CF2 AND CF2.2) or CF21) AND (CF10 OR CF13) AND CF29:M | Yes  No  N/A  |
| SM20.5(#4252) | Reception of channel wrapper element and procedures, in conjunction with channel switch announcement or extended channel switch announcement  | 10.39.1 (Basic VHT BSS functionality) | (CF2 OR CF21) AND (CF10 OR CF13) AND CF29:M | Yes  No  N/A  |

Discussion:

While the commentor seems to be correct, (CF2 AND CF2.2) is inherited from IEEE 802.11-2012. It is preferred to deal with it as part of Revmc.

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| 6165 | 324.52 | B.4.23.1 | What does "O.1" mean? | Clarify it. |

Proposed Resolution: Revised

Context:

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| --- | --- | --- | --- | --- |
| VHTM16.2(#5395) | Transmission of at least 2x1 STBC | 8.4.2.160.2 (VHT Capabilities Info field) | VHTP9:O.1 | Yes  No  N/A  |

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| VHTP9(#5395) | Space-time block coding (STBC) | 22.3.10.9.4 (Space-time block coding) | CF29:O | Yes  No  N/A  |

Proposed Change:

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| --- | --- | --- | --- | --- |
| VHTM16.2(#5395) | Transmission of at least 2x1 STBC | 8.4.2.160.2 (VHT Capabilities Info field) | VHTP9:O. | Yes  No  N/A  |

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| 6166 | 324.57 | B.4.23.1 | What does "O.1" mean? | Clarify it. |

Proposed Resolution: Revised

Context:

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| --- | --- | --- | --- | --- |
| VHTM16.3(#5395) | Reception of 1 STBC spatial stream | 8.4.2.160.2 (VHT Capabilities Info field) | VHTP9:O.1 | Yes  No  N/A  |

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| --- | --- | --- | --- | --- |
| VHTP9(#5395) | Space-time block coding (STBC) | 22.3.10.9.4 (Space-time block coding) | CF29:O | Yes  No  N/A  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VHTM16.3(#5395) | Reception of 1 STBC spatial stream | 8.4.2.160.2 (VHT Capabilities Info field) | VHTP9:O. | Yes  No  N/A  |

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| --- | --- | --- | --- | --- |
| 6438 | 318.51 | B.4.3 | It should be OK to implement an 11ac-only device (in the same way as it's OK to implement an ERP-only device) | Change the condition to "O.2" |

Proposed Resolution: Rejected

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| \*CF29(#4125) | Very High Throughput (VHT) Features | 8.4.2.160 (VHT Capabilities element) | O | Yes  No  |

Discussion: An 11ac (or VHT) only device is not possible since the device has to be an HT device as well.

**References:**