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.

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: Defer

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 Clause 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: Revised

Mesh STA and independent STA are added as requested by the commenter. Make the changes in 11-12/0807r1 under CID 6139.

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,*

Mesh STA and Independent STAs also tranmsit Operating element in theor Beacon.

Proposed Changes:

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| VHTM2 | Signaling of VHT operation | 8.4.2.161 (VHT Operation element) | (CF29 AND CF1):M(CF29 AND CF21):M(CF29 AND CF2.2):M | Yes  No  N/A  |

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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

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

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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

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

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

Make changes as in doc 11-12/807r1 for CID 6142.

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 if the STA is capab;le of dynamic.

It seems that reference in the PICS table is not correct. The reference should be 9.3.2.5a.

Proposed Changes:

Instructions to the Editor:

***Replace VHTM10 with the following table***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VHTM10 | BandWidth Signaling |  |  |  |
| VHTM10.1 | Support for non-HT Bandwidth signaling and Static operation | 9.3.2.5a (VHT RTS Procedure) | CF29:M | Yes  No  N/A  |
| VHTM10.2 | Support for non-HT Bandwidth signaling and Dynamic operation | 9.3.2.5a (VHT RTS Procedure) | CF29:O | 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

It is not clear how the Extended BSS element will be used in a MBSS. The commenter is encouraged to submit a proposal for how the element is applicable to MBSS.

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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

Make changes in doc 11-12/807r1 for CID 6161.

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 operation | 10.39.1 (Basic VHT BSS functionality) | CF29:OVHTP3.5:M | Yes  No  N/A  |
| VHTP3.5 | 80+80 MHz operation | 10.39.1 (Basic VHT BSS functionality) | CF29:O | 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

The ability to signal the bandwidth is mandatory. However performing dynamic bamdwidth operation is optional. CID 6142 resolution higlihted the fact that Dynamic bandwidth operation is optional while the signalling is mandaotry

Context:

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

Discussion:

The ability to signal the bandwidth is mandatory. However performing dynamic bamdwidth operation is optional.

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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 resolution: Rejected

The commenter doesn’t indicate a problem to be fixed or a change to be made. In reply to the commenter, this material follows the precedent established by .11n.

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  |

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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: Revised

Chnges are in doc11-12/807r1 in CID 6164.

Context:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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:

The commentor is correct.

Proposed Changes:

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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 CF2.2 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) | CF21AND (CF10 OR CF13) AND CF29:M | Yes  No  N/A  |

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

Proposed Resolution: Rejected

The terminology is defined in B.2.1 in the baseline.

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  |

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

Proposed Resolution: Rejected

The terminology is defined in B.2.1 in the baseline.

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  |

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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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| \*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:**