IEEE P802.11
Wireless LANs

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| LB187 resolutions for various CIDs |
| Date: 2012-05-03 |
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Abstract

This document proposes resolutions for the following CIDs:

MAC: 4509, 4512, 4027, 4173, 4909, 4978, 4640, 4964, 4654, 4285, 4527, 4528, 5349, 5407, 4784, 4349, 4350, 5351

COEX: 4043

CIDs with Resolution in RED need more discussion.

Editing instructions based on P802.11ac/D2.1.

r0 Discussion on 2012-05-03 telecon

r1 Edits as discussion on 2012-05-03 telecon.

## Comment on the frame name NDPA (MAC)

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| **CID** | **Commenter** | **Clause Number(C)** | **Page(C)** | **Line(C)** | **Comment** | **Proposed Change** | **Resolution** |
| 4509 | David Hunter | 3.3 | 6 | 19 | There are dozens of frame names that are each used multiple times, without requiring new acronyms. This draft is far too laden with acronyms already; we don't need such superfluous ones as "NDPA". | Throughout the draft delete the definition of "NDPA" and replace "NDPA" with "NDP Announcement" (retain the capital "A" in this, since it is part of the name of a frame). | REVISEDD. Change to VHT NDP Announcement. Also, delete the acronym definition for NDPA. See #4921 |

## Discussion

This change has already been approved with #4921 and appears in D2.1 (grrr…).

## Comment on 4.3.10a (MAC)

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| 4512 | David Hunter | 4.3.10a | 8 | 65 | This line conflicts directly with line 17 above. Line 17 says a VHT STA is an HT STA, but line 65 says it does not support RIFS, which HT STAs can do. | Is a VHT STA that is operating as an HT STA not allowed to support RIFS in its HD transmission / receipt? Or is a VHT STA that currently operating as an HT STA currently not a VHT STA. Specify when a VHT STA stops operating as a VHT STA. | <see below> |

## Resolution

REJECT. There is no conflict. A VHT STA is an HT STA with additional features and restrictions, some of which may affect operation with HT frames and elements defined in 802.11n. For example, the setting of the HT Capabilities element is constrained when operating as a VHT AP or VHT non-AP STA. Not transmtting PPDUs (including HT PPDUs) with RIFS is another such restriction. None of these restrictions affect interoperability with (non-VHT) HT STAs. A VHT STA is defined as a STA that transmits a VHT Capabilities element (see 8.4.2.160.1), i.e. it has nothing to do with the capabilities of the implementation. A (non-VHT) HT STA does not transmit this element and is thus not bound by requirements applicable to a VHT STA.

## Comment on RA field of CTS frame (MAC)

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| 4027 | Adrian Stephens | 8.3.1.3 | 34 | 31 | "the RA field of the CTS frame is copied from the TA field of the immediately previous RTS frame to which the CTS is a response and the Individual/Group bit in the RA field is set to 0."This is not strictly true. The I/G bit of the RA field of the CTS can't both be set from the previous RTS frame and set to 0. | replace the "and the" with "except that the" | ACCEPT |

## Discussion

With the proposed change the text reads:

When the CTS frame follows an RTS frame, the RA field of the CTS frame is copied from the TA field of

the immediately previous RTS frame to which the CTS is a response except that the Individual/Group bit in the RA field is set to 0. When the CTS is the first frame in a frame exchange, the RA field is set to the MAC address

of the transmitter.

## Comment on TA field of RTS frame (MAC)

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| 4173 | Alex Ashley | 8.3.1.2 | 34 | 20 | "Otherwise the TA field is the address of the STA transmitting the RTS frame." is a duplicate of the normative rule specified on line 16. There is no need for this sentence. | Remove "Otherwise the TA field is the address of the STA transmitting the RTS frame." | <see below> |

## Discussion

Signaling TA has the following definition:

**signaling transmitter address (signaling TA)**: a TA that is used by a VHT STA to indicate the presence of additional signaling related to the establishment of an EDCA TXOP. It is represented by the IEEE MAC individual address of the transmitting VHT STA but with the Individual/Group bit set to 1.

The current text in 8.3.1.2 reads:

The TA field is the address of the STA transmitting the RTS frame or a signaling TA. The TA field is set to a signaling TA in an RTS frame transmitted by a VHT STA in a non-HT or non-HT duplicate format to indicate that the scrambling sequence carries the TXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT (see 9.3.2.5a (VHT RTS procedure)). Otherwise the TA field is the address of the STA transmitting the RTS frame.

The comment refers to the last sentence.

However, the text in this paragraph is misleading. Even if the field carries the signaling TA it still carries the address of the transmitting STA. Clarify that a signaling TA still carries the transmitter’s address. Clarify when the signaling TA is used.

I have reviewed this against Reza’s changes in 12/508r1 and see no conflict.

## Resolution

REVISED. Change the cited paragraph as shown in <this document>.

The TA field is the address of the STA transmitting the RTS frame or a signaling TA, which is the address of the STA transmitting the RTS frame but with the Individual/Group bit set to 1. A signaling TA is used by a VHT STA in a non-HT or non-HT duplicate format to indicate that the scrambling sequence carries the TXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT

and DYN\_BANDWIDTH\_IN\_NON\_HT (see 9.3.2.5a (VHT RTS procedure)).

## Comments on HT Control field (MAC)

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| **CID** | **Commenter** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4909 | Matthew Fischer | 29.04 | 4 | 8.2.4.6.1 | Need a real name for "fields specific to the HT or VHT variant". The better way to describe this is to assign a specific name to these bits and then use that field name in the individual descriptions of the contents which appear in each of the variant descriptions. | Rename "fields specific to the HT or VHT variant" to "HT Control Midfield" - include individual descriptions of the sub-fields within this field within the subclauses the describe each of the variants of the larger field. | REVISED. Name the bits “HT Control Middle” (to avoid using field in the name). Editing instructions for CID 4909 in <this document>. |
| 4978 | Osama Aboulmagd | 29.04 | 4 | 8.2.4.6.1 | I think some of the figures in Clause 8 are mis-numbered | coorect numbering if necessary | ACCEPT |
| 4640 | Juho Pirskanen | 29.38 | 38 | 8.2.4.6.2 HT variant | The figure 1-5a modifies HT variant of HT control field. The link Adaptation control field modification is OK as there is one reserved bit but the modification of last reserved bit B29 is unclear. It is marked as DEI but there is no definition of it in draft 2.0 nor latest REVmb\_D12. This seems to modify .11n functionality | Clarify why DEI - field is inserted and in where it is defined. | REJECT. The DEI field is inserted by P802.11aa, which is part of the P802.11ac baseline. |

## Discussion

4909: Editing instructions below

4978: Numbering errors have been corrected as of D2.1

## Resolution

Editing instructions for 4909:

***Change the field name for B1-B29 of Figure 8-5 to “HT Control Middle”.***

***Change the 3rd paragraph of 8.2.4.6.1 as follows:***

The HT Control field has two forms, the HT variant and the VHT variant. The two forms differ in the format of the HT Control Middle subfield, described in 8.2.4.6.2 (HT variant) for the HT variant and in 8.2.4.6.3 (VHT variant) for the VHT variant.

***Change the 1st paragraph of 8.2.4.6.2 as follows:***

The format of the HT Control Middle subfield of the HT variant HT Control field is shown in Figure 8-5a.

***Replace the title of Figure 8-5a with “HT Control Middle subfield of the HT variant HT Control field”***

***Change the 1st paragraph of 8.2.4.6.3 as follows:***

The format of the HT Control Middle subfield of the VHT variant HT Control field is shown in Figure 8-8a.

***Replace the title of Figure 8-8a with “HT Control Middle subfield of the VHT variant HT Control field”***

## Comment on MSI/STBC subfield in HT Control field (MAC)

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| **CID** | **Commenter** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4964 | Nir Shapira | 31.25 | 25 | 8.2.4.6.3 | I think it is more accurate to say "STBC was/was not" instead of "is/is not" | change as suggested | REVISED. The STBC Indication is for the frame on which the MFB estimate was made and this should be reflected in the field description. Editing instructions provided for CID 4964 provided in <this document>. |

## Resolution

Editing instructions for CID 4964:

***Change the subfield description in Table 8-13a as follows:***

The STBC Indication subfield indicates whether or not the estimate in the MFB subfield is computed based on a PPDU using STBC encoding:

Set to 0 if the PPDU was not STBC encoded

Set to 1 if the PPDU was STBC encoded

5240 is on the same topic. Resolve both with this resolution.

## Comments on subclause 8.2.5 (MAC)

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| **CID** | **Commenter** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4654 | kaiying Lv | 33.37 | 37 | 8.2.5 | "Acknowledgement" is not accurate. Currently, only ACK/BACK and poll response are defined as acknowledgement. Beamforming report frame is not clarified yet. | change to "response frame" | REJECTED. “pending frame and its acknowledgement” refers to the sequences Data-ACK, Data-BA or management-ACK. The term “acknowledgement is correctly used since it refers to the ACK or BA in these sequences. |
| 4285 | Brian Hart | 33.38 | 38 | 8.2.5.2 | NDP should be VHT NDP, 2x in this para | NDP -> VHT NDP, 2x. Search for NDP elsewhere and verify NDP and VHT NDP are used correctly - -e.g. Table 8-18a | <see below> |
| 4527 | David Hunter | 33.38 | 38 | 8.2.5.2 | The Duration/ID field is a field in each of these frames, not an attribute of the frames. | Replace "For an NDPA frame," with "In an NDP Announcement frame" and on line 47 replace "For a Beamforming Poll frame," with "In a Beamforming Poll frame" (note the deletion of the commas). Yes, we understand that this is equally botched in 11mb; that is a problem for 11mc. | <see below> |
| 4528 | David Hunter | 33.62 | 62 | 8.2.5.2 | What is a Compressed Beamforming response frame? | Either define somewhere what frames count as Compressed Beamforming response frames, or defined this as a frame that contains a Compressed Beamforming Report field, or ? This change also affects lines 39 and 44 of this page. | <see below> |

## Discussion for 4654

The new bullets 7) and 8) refer to the following sequences:

* VHT NDP Announcement-VHT NDP-VHT Compressed Beamforming followed by a “pending frame and its acknowledgement”
* Beamforming Report Poll-VHT Compressed Beamforming followed by a “pending frame and its acknowledgement”

The phrase “pending frame and its acknowledgement” refers to the sequences Data-ACK, Data-BA or Management-ACK and is correctly used in this context.

## Discussion For 4527 and 4528:

The “single protection settings” and “multiple protection settings” are introduced as follows:

In single protection, the value of the Duration/ID field of the frame can set a NAV value at receiving STAs that protects up to the end of any following data, management, or response frame plus any additional overhead frames as described below. In multiple protection, the value of the Duration/ID field of the frame can set a NAV that protects up to the estimated end of a sequence of multiple frames.

I interpret this to mean that single protection paragraph deals with simple, common exchanges of known duration while multiple protection deals with more complex sequences of unknown duration (hence “estimated end of sequence”).

The comments refer to the two new bullets under “single protection settings” that refer to the following sequences:

* VHT NDP Announcement-VHT NDP-VHT Compressed Beamforming followed by a “pending frame and its acknowledgement”
* Beamforming Report Poll-VHT Compressed Beamforming followed by a “pending frame and its acknowledgement”

These do not belong under “single protection settings” since

1. These are complex sequences that are not likely to be widely implemented (the benefit over using a separately contended TXOP is small)
2. These sequences are of unknown duration since the MCS and field sizes of the VHT Compressed Beamforming frame is not known to the beamformer
3. They do not account for additional extensions to the sequence such as VHT NDP Announcement-VHT NDP-VHT Compressed Beamforning-Data-ACK-Data-ACK (i.e. “pending frames and their acknowledgements” - plural)

Also, as complex multi-frame sequences, these cases are already covered by the “multiple protection settings” paragraph case 3) where the Duration/ID setting D must conform to:

min(T\_pending, T\_txop – T\_ppdu) <= D <= T\_txop – T\_ppdu

For D in the VHT NDP Announcement frame:

T\_pending = duration of VHT NDP + VHT Compressed Beamforming + “Pending MPDUs of the same AC” + “Any associated immediate response frames” + “Applicable IFS durations”

## Resolution for 4527 and 4528:

REVISED. Bullets 7) and 8) are unnecessary since the condition described is adequately covered by the “multiple protection settings” paragraph. Delete bullets 7) and 8) and add a sentence and note to the introductory pragraph:

 “VHT NDP Announcement frames and Beamforming Report Poll frames always use multiple protection settings.

NOTE—Any TXOP involving transmission of VHT NDP Announcement frames and Beamforming Report Poll frames therefore uses multiple protection settings.”

REVISED. Delete the bullet “Any Beamforming Report Poll and VHT Compressed Beamforming response frames” and change the previous bullet to read “Any NDP or Beamforming Report Poll frame transmissions and explicit feedback response frames”.

Resolution for 4285:

See the resolution for 4527 and 4528. These delete the cited text. Search for NDP elsewhere and verify that NDP and VHT NDP are used correctly.

## Comment on “Category values” table in 8.1.11 (MAC)

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| **CID** | **Commenter** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5349 | Yasuhiko Inoue | 41.15 | 15 | 8.4.1.11 | Table 8-38 in IEEE 802.11REVmb D12.0 has column named "Group addressed privacy" but the table 8-38 in this draft does not. | Modify the table 8-38 to have the same format with the original one and add information on "Group addressed privacy" for VHT type. | REVISED. Add “Group addressed privacy” column with “No” for all VHT entries. |
| 5407 | Yusuke Asai | 41.15 | 15 | 8.4.1.11 | The column of "Group addressed privacy" is lost in Every existing row in Table 8-38. | Add a column of "Group addressed privacy" with the value of "No." | ACCEPTED |
| 4784 | Mark RISON | 41.16 | 16 | 8.4.1.11 | The "Group Addressed Privacy" of VHT Action frames is not specified | Add a column "Group addressed privacy" and give the value for VHT as No | ACCEPTED |

## Discussion

The “Group addressed privacy” column is missing from Table 8-38.

## Comments on the VHT Action field (MAC)

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| 4349 | Brian Hart | 81.25 | 25 | 8.5.13.7 | "frame formats are defined to support ... frames" doesn't add much | "several action frame formats are defined to support VHT functionality" | ACCEPTED |
| 4350 | Brian Hart | 81.26 | 26 | 8.5.23.1 | VHT Action field | Term not defined. "Action field for action frames of category VHT"? | REJECTED. The Action field consists of the Category field followed by the Action Details (see Figure 8-45). Each category of Action frame has its own Action Details field which typically begins with a field named <Category> Action field. For the VHT category, this field is the 1-octet VHT Action field. |

## Discussion

**For 4349:**

Using the proposed change, the paragraph would read:

Several Action frame formats are defined to support VHT functionality. A VHT Action field, in the octet immediately after the Category field, differentiates the VHT Action frame formats. The VHT Action field values associated with each frame format within the VHT category are defined in Table 8-281ah (VHT Action field values).

## Comment on RIFS (MAC)

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| 5351 | Yasuhiko Inoue | 91.48 | 48 | 9.3.2.3.2 | "RIFS in the OBand is an obsolete mechanism that is subject to removal in a future revision of this standard."I understand and agree with this text, but I do not think this text should be here. | Remove this text. | <see below> |

## Resolution

REVISED. The feature cannot be removed from the standard since is used and will continue to be used by DMG STAs. Change the cited paragraph to read: “The use of RIFS by non-DMG STAs is obsolete and support for such use may be subject to removal in a future revision of the standard. A VHT STA shall not transmit frames separated by a RIFS.”

## Comment (COEX)

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| 4043 | Adrian Stephens | 9.3.2.5a | 92 | 45 | "If the STA sending the RTS frame is using dynamic bandwidth operation,"This is a poorly defined term. It is not clear what "using" means at this point. | Reword: "If the STA sending the RTS frame is capable of dynamic bandwidth operation (see 9.3.2.6),"Add definition (to 3.2): "dynamic bandwidth operation: a feature of a VHT STA in which the RTS/CTS exchange negotiates a potentially reduced channel width for subsequent transmissions within the current TXOP using non-HT or non-HT duplicate RTS and CTS frames." | ACCEPTED |

## Discussion

Adopt the proposed change for the reasons given in the comment