IEEE P802.11  
Wireless LANs

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| SB02 resolutions for various comments | | | | |
| Date: 2013-09-05 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Robert Stacey | Intel |  | +1-503-724-0893 | rstacey@apple.com |

Abstract

This document proposes resolutions for various comments from SB02.

Editing instructions based on P802.11ac/D6.0.

## Editorial CIDs

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11011 | 256.00 | 1 | 22.3.10.5.4 | LDPC Extra OFDM Symbol field is in VHT-SIG-A2. From the context with the next sentence, VHT-SIG-A field should be VHT-SIG-A2 field instead. | As in comment. | REVISED. Change VHT-SIG-A2 to VHT\_SIG-A, i.e., to read “…then the LDPC Extra OFDM Symbol field of VHT-SIG-A shall be set to 1.  Otherwise, the LDPC Extra OFDM Symbol field of VHT-SIG-A shall be set to 0.” |
| 11017 | 6.00 | 3 | 3.2 | Typo: "HT tTransmit" | Correct | REJECTED - The autoreferencing causes this anomaly. The referenced title is removed in the published spec. |
| 11001 | 410.00 | 45 | M.6.4 | The CCMP test vector changes in D6.0 seem to have small editing issues with an extra "CS:" showing up next to "FCS". | Replace "(without FCS): CS):" with "(without FCS):" on page 410 line 45.  Replace "FCS: CS: " with "FCS: " on page 410 line 51. | ACCEPTED |
| 11009 | 145.00 | 7 | 9.12.2 | The Maximum A-MPDU Exponent Length fields should be the Maximum A-MPDU Length Exponent fields instead. | Change "the Maximum A-MPDU Exponent Length fields" to "the Maximum A-MPDU length Exponent fields". | ACCEPTED |
| 11008 | 202.00 | 13 | 11.4.4.5 | The integrity value can now be longer than 64 bits. | Remove '64-bit' from the phrase 'insert the 64-bit output into the MME MIC field' | ACCEPTED |
| 11004 |  |  |  | This draft meets all editorial requirements. |  | REJECTED – We reject comments that do not identify a problem in the draft. |
| 11031 | 247.00 | 37 | 22.3.4.6 | Missing "is" | Replace "and constructed as follows" with "and is constructed as follows" | ACCEPTED |
| 11027 | 188.00 | 32 | 10.22.6.4.1 | Typo: VHT STAT | Replace STAT with STA | ACCEPTED |
| 11037 | 274.00 | 9 | 22.3.8.3.5 | Subscript of N\_STS,total should be italic (compare with line 6) | Correct | ACCEPTED |

# CID 11020

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11020 | 42.00 | 16 | 8.2.4.7.1 | What is the purpose of NOTE 3? If someone implements proprietary cipher suites, aren't they already out of the standard? Why impose standard behavior on such a system? | Clarify | REVISED – Delete NOTE 3 and apply editorial changes outlined in <this doc> |

## Discussion

In a VHT PPDU, the maximum MPDU size is constrained. In an HT, non-HT or DMG PPDU it is the MSDU size that is constrained. In the former case the encryption overhead needs to be accounted for when forming the MPDU. This is clear from the normative paragraph in this subclause.

The commenter is pointing out that vendor specific cypher suites are beyond the scope of the standard and thus there is no need for a NOTE alerting the reader to the impact the use of such a cipher suites would have on MPDU formation.

While reviewing the subclause I noticed a few editorial issues that should be corrected.

1. The Mesh Control field is mentioned in the security encapsulation. This is better mentioned as a separate bullet.
2. The NOTEs are new inserts and should be underlined.

## Editing instructructions

***Editor: change 8.2.4.7.1 as follows (underlining is missing from NOTEs):***

The Frame Body is a variable-length field that contains information specific to individual frame types and subtypes. The minimum length of the frame body is 0 octets. The maximum length of the frame body is ~~defined by the maximum length MSDU plus the length of Mesh Control field as defined in 8.2.4.7.3, if present, plus any overhead for encryption as defined in Clause 11, or by the maximum length A-MSDU plus any overhead for encryption as defined in Clause 11.~~constrained or affected by:

* The maximum MMPDU, MSDU, A-MSDU and MPDU sizes supported by the recipient(s) for the PPDU format in use, as specified in Table 8-13c (Maximum data unit sizes (in octets) and durations (in microseconds))
* The maximum PPDU duration (e.g., HT\_MF L SIG L\_LENGTH, HT\_GF, VHT or DMG aPPDUMaxTime (see Table 8-13c (Maximum data unit sizes (in octets) and durations (in microseconds))); any nonzero TXOP Limit; any regulatory constraints (e.g., CS4-msBehavior))
* The fields present in the MAC header (e.g., QoS Control, Address 4, HT Control)
* The presence of security encapsulation (e.g., TKIP, CCMP or GCMP header and MIC)
* The presence of the Mesh Control fields (see 8.2.4.7.2)

NOTE 1—In an A-MSDU, the Mesh Control field is located in the A-MSDU Subframe Header (see Figure 8-33). In an

MMPDU, the Mesh Control field is located within the MMPDU (see 8.5.18). Such Mesh Control fields need to be taken into account if a maximum A-MSDU or MMPDU size constraint applies, as well as if a maximum MPDU size constraint applies.

NOTE 2—TKIP is not allowed with A-MSDUs (see 11.1.6) or MMPDUs (see 11.4.4.1), so need not be taken into account if a maximum A-MSDU or MMPDU size constraint applies.

# CID 11019

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11019 | 38.00 | 12 | 8.2.4.6.2 | Replace "HT Control field" with "HT variant HT Control field" | See comment | ACCEPTED |

## Discussion

In the HT variant subclause.

# CID 11016

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11016 | 3.00 | 33 | 3.2 | In the definition of 40 MHz PPDU, there seems to be inconsistencies in the naming of the different PPDU types. E.g.: bullet 4) uses "Clause 20 20 MHz HT PPDU", while bullet 7) uses 40 MHz HT PPDU, without reference to the Clause. Similar difference between bullets 5) and 6). | Use consistent terminology | REVISED – Apply changes shown in <this doc>, which remove the “Clause 20” and “Clause 22” adjectives. |

## Editing instructions

***Delete “Clause 20” and “Clause 22” as shown below:***

**40 MHz mask physical layer convergence procedure (PLCP) protocol data unit (PPDU):** One of the following PPDUs:

1. A 40 MHz high-throughput (HT) PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW40) transmitted using the 40 MHz transmit spectral mask defined in Clause 20.
2. A 40 MHz non-HT duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to NON\_HT\_CBW40) transmitted by a non-VHT STA using the 40 MHz transmit spectral mask defined in Clause 20.
3. A 40 MHz non-HT duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW40) transmitted by a VHT STA using the 40 MHz transmit spectral mask defined in Clause 22.
4. A 20 MHz HT PPDU with the TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW20 and the CH\_OFFSET parameter equal to either CH\_OFF\_20U or CH\_OFF\_20L transmitted using the 40 MHz transmit spectral mask defined in Clause 20.
5. A 20 MHz VHT PPDU with the TXVECTOR parameter CH\_BANDWIDTH equal to CBW20 transmitted using the 40 MHz transmit spectral mask defined in Clause 22.
6. A 40 MHz very high throughput (VHT) PPDU with the TXVECTOR parameter CH\_BANDWIDTH equal to CBW40 transmitted using the 40 MHz transmit spectral mask defined in Clause 22.
7. A 40 MHz high-throughput (HT) PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW40) transmitted by a VHT STA using the 40 MHz transmit spectral mask defined in Clause 22.
8. A 20 MHz non-HT PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW20) transmitted using the 40 MHz transmit spectral mask defined in Clause 20.
9. A 20 MHz non-HT PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW20) transmitted by a VHT STA using the 40 MHz transmit spectral mask defined in Clause 22.

~~The PPDU is transmitted using a 40 MHz transmit spectral mask defined in Clause 20 (High Throughput (HT) PHY specification).~~

**40 MHz physical layer ~~convergence procedure (PLCP)~~ protocol data unit (PPDU)**: A 40 MHz high throughput (HT) PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW40) or a 40 MHz non-HT duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to NON\_HT\_CBW40 or TXVECTOR parameter CH\_BANDWIDTH equal to CBW40) ~~as defined in Clause 20~~, or a 40 MHz very high throughput (VHT) PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW40).

# CID 11015 and 11014

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11015 | 3.00 | 8 | 3.2 | "A Clause 22 20 MHz HT PPDU with TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CDW20" is a pleonasm. | Replace "A Clause 22 20 MHz HT PPDU with TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW20" with "A Clause 22 HT PPDU with TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW20  Note that this occurs throughout the definition section for 20MHz, 40 MHz an 80 MHz PPDUs. | REVISED – Apply editing instructions in <this document> which remove the “Clause 20 20 MHz” and “Clause 22 20 MHz” adjectives. |
| 11014 | 3.00 | 8 | 3.2 | "A Clause 22 20 MHz HT PPDU" seems to reference the wrong clause | Replace "A Clause 22 20 MHz HT PPDU" with "A Clause 20 20 MHz HT PPDU"  (Compare e.g. with item 4) under definition of "40 MHz mask PPDU") | REVISED – Apply editing instructions in <this document> which remove the “Clause 20 20 MHz” and “Clause 22 20 MHz” adjectives. |

## Editing instructions

**20 MHz mask physical layer ~~convergence procedure (PLCP)~~ protocol data unit (PPDU):** ~~A Clause 18 (Orthogonal frequency division multiplexing (OFDM) PHY specification) PPDU, a Clause 19 (Extended Rate PHY (ERP) specification) orthogonal frequency division multiplexing (OFDM) PPDU, or a Clause 20 (High Throughput (HT) PHY specification) 20 MHz high-throughput (HT) PPDU with the TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW20 and the CH\_OFFSET parameter equal to CH\_OFF\_20. The PPDU is transmitted using a 20 MHz transmit spectral mask defined in Clause 18 (Orthogonal frequency division multiplexing (OFDM) PHY specification), Clause 19 (Extended Rate PHY (ERP) specification), or Clause 20 (High Throughput (HT) PHY specification).~~ One of the following PPDUs:

1. A Clause 18 PPDU transmitted using the transmit spectral mask defined in Clause 18.
2. A Clause 19 orthogonal frequency division multiplexing (OFDM) PPDU transmitted using the transmit spectral mask defined in Clause 19.
3. An high-throughput (HT) PPDU with the TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW20 and the CH\_OFFSET parameter equal to CH\_OFF\_20 transmitted using the 20 MHz transmit spectral mask defined in Clause 20.
4. A very high throughput (VHT) PPDU with TXVECTOR parameter CH\_BANDWIDTH equal to CBW20 transmitted using the 20 MHz transmit spectral mask defined in Clause 22.
5. A Clause 18 PPDU transmitted by a VHT STA using the transmit spectral mask defined in Clause 22.
6. An high-throughput (HT) PPDU with the TXVECTOR parameter CH\_BANDWIDTH equal to HT\_CBW20 and the CH\_OFFSET parameter equal to CH\_OFF\_20 transmitted by a VHT STA using the 20 MHz transmit spectral mask defined in Clause 22.

# CID 11023

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11023 | 147.00 | 42 | 9.12.6 | Wrong reference: 9.19.2.2a should be 9.19.2.3a | Correct reference | ACCEPTED |

## Discussion

The error seems to have accurred because a manual cross reference is present that was not automatically updated.

Context:

Subsequently, for each user *n*, as permitted by the rules for EDCA TXOP Sharing (see 9.19.2.2a Sharing an EDCA TXOP), a VHT STA may add A-MPDU subframes to the A-MPDU for that user that meets either of the following conditions:

# CID 11013

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** |
| 11013 | 7.00 | 46 | 3.2 | This comment relates to my previous comments # i-149 (10149), # i-165 (10165), and # i-183 (10183). I do not object to using the A-MPDU format to transmit a single MPDU. As I previously pointed out, it is already allowed in 8.6.1 of 802.11-2012 by the sentence "An A-MPDU consists of a sequence of \*one\* or more A-MPDU subframes as shown in Figure 8-503.". But I do not understand why this VHT single MPDU has lots of exceptions to the general A-MPDU, such as banned from using an implicit BAR, allowing fragmentation (resulting in carring all the fragments in VHT single MPDUs, not in ordinary A-MPDUs), and requiring transmission of ACK instead of BA. By these exceptions, one has to prepare exception handling in the A-MPDU process. And I do not see the necessity or benefits to these exceptions over the additional process. Furthermore, when I looked into the REVmc WG Ballot comments (doc.:11-13-0233r11), it seems that changes shown in doc.:11-13-577r1 will be made related to CID 287. The proposal in doc.11-13-577r1 uses the properties of the PPDU causing the EIFS to presume whether the possible response is an ACK or a BA. This method can not be applied to 11ac in the future, because the response for the A-MPDU may be BA or ACK which can be only determined by the EOF subfield of the MPDU delimiter field due to the existence of a VHT single MPDU. | Delete VHT single MPDUs throughout the draft and just add a sentence in an appropriate place that a VHT PPDU shall always be transmitted in the A-MPDU format. |

## RESOLUTION

REJECTED

With HT frames the acknowledgement rule for Ack Policy = “Normal Ack/Implicit BA” is dependent on the AGGREGATION field in the PHY header: if the AGGREGATION field is 0 and the PPDU contains a non-aggregated MPDU, the responder sends an ACK response. If the AGGREGATION field is 1 and the PPDU contains an A-MPDU, even if there is only one MPDU present, the responder sends a BA response. Also, rules limit the transmission of management frames to HT PPDUs with AGGREGATION = 0.

To effect the same behavior with VHT PPDUs, we need an encapsulation mechanism that is equivalent to AGGREGATION = 0 in HT PPDUs. Since VHT PPDUs do not have a length field in the PHY header they necessarily require the A-MPDU header be present. VHT single MPDU encapsulation is the equivalent encapsulation for VHT PPDUs to AGGREGATION=0 encapsualtion in HT PPDUs.

Ack behavior heuristics and management frame rules developed for HT PPDUs can thus be applied to VHT PPDUs.

HT PPDU (non-aggregate):

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| --- | --- |
| PHY header:  LENGTH = MPDU length  AGGREGATION = 0 | MPDU |

VHT PPDU (VHT single MPDU):

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| --- | --- | --- |
| PHY header | A-MPDU header:  MPDU Length  EOF = 1 | MPDU |

# CID 11021

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11021 | 68.00 | 49 | 8.4.1.19 | "MU Exclusive Beamforming Report field" isn't a particularly descriptive name for this field. Yes, it's only included for MU sounding feedback, but it would still make more sense to call it something like "Delta SNR Report field". | Change "MU Exclusive Beamforming Report" to "Delta SNR Report" | REJECTED – The field name is descriptive in the sense that it applies exclusively to MU beamforming. |