IEEE P802.11
Wireless LANs

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| LB190 - Comment Resolution  |
| Date: Jan 10, 2013 |
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Abstract

This document provides resolution for the following CIDs:

7201, 7202, 7203, 7247, 7248, 7249, 7228, 7246, 7384, 7204

The comments are based on D4.0.

Edits for the proposed resolutions are based on D4.0.

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7203 | 8.4.2.162 | 102 | 36 | The description for the 160 MHz Utilization fields is does not match the formula. The formula does not make sense. The field is described as the "percentage of time that the 160 MHz or 80+80 MHz channel was busy". However, the formula would suggest that it is the percentage of time the primary 160/80+80 MHz channel is busy while CCA indicates busy. The only definition in the spec for "160/80+80 MHz channel busy" is CCA(BUSY, {primary}) or CCA(BUSY, {secondary}) or CCA(BUSY,{secondary40}) or CCA(BUSY,{secondary80}). So the formula is really saying time(CCA(BUSY, {primary})+CCA(BUSY, {secondary})+CCA(BUSY,{secondary40})+CCA(BUSY,{secondary80}))/time(CCA(BUSY,{primary})+CCA(BUSY,{secondary})+CCA(BUSY,{secondary40}+CCA(BUSY,{secondary80}), which 1. Clearly this is useless. | Remove the 160 MHz Utiliation field |
| 7202 | 102.29 | 29 | 8.4.2.162 | The description for the 80 MHz Utilization fields is does not match the formula. The formula does not make sense. The field is described as the "percentage of time that the primary 80 MHz channel was busy". However, the formula would suggest that it is the percentage of time the primary 80 MHz channel is busy while CCA indicates busy. The only definition in the spec for "primary 80 MHz channel busy" is CCA(BUSY, {primary}) or CCA(BUSY, {secondary}) or CCA(BUSY,{secondary40}). So the formula is really saying time(CCA(BUSY, {primary})+CCA(BUSY, {secondary})+CCA(BUSY,{secondary40}))/time(CCA(BUSY,{primary})+CCA(BUSY,{secondary})+CCA(BUSY,{secondary40}+CCA(BUSY,{secondary80}), which is really the percentage of time the primary 80 MHz channel is busy relative to the time any of the subchannels are busy. It is not clear how a STA benefits from this information. | Remove the 80 MHz Utiliation field |
| 7201 | 102.22 | 22 | 8.4.2.162 | The description for the 40 MHz Utilization fields is does not match the formula. The formula does not make sense. The field is described as the "percentage of time that the 40 MHz channel was busy". However, the formula would suggest that it is the percentage of time the primary 40 MHz channel is busy while CCA indicates busy. The only definition in the spec for "primary 40 MHz channel busy" is CCA(BUSY, {primary}) or CCA(BUSY, {secondary}). So the formula is really saying time(CCA(BUSY, {primary})+CCA(BUSY, {secondary}))/time(CCA(BUSY,{primary})+CCA(BUSY,{secondary})+CCA(BUSY,{secondary40}+CCA(BUSY,{secondary80}), which is really the percentage of time the primary 40 MHz channel is busy relative to the time any of the subchannels are busy. It is not clear how a STA benefits from this information. | Remove the 40 MHz Utilization field |

**Discussion:**

The 40 (80, 160) MHz channel utilization field is defined as the percentage of time, linearly scaled with 255 representing 100%, that the primary 40 (80, 160) MHz MHz channel was busy.

This percentage is computed using the formula,

40 MHz Utilization = 

80 MHz Utilization = ,

160 MHz Utilization = 

“where Tcca\_busy is the number of microseconds during which the CS mechanism, as defined in 9.3.2.2 (CS mechanism), has indicated a channel busy condition.

T40, busy, T80, busy, T460, busy and are defined to be the number of microseconds during which the AP was transmitting a 40 MHz PPDU t o a VHT STA, 80 MHz PPDU, or a 160 MHz PPDU respectively.”

The commentor points out that “ … . However, the formula would suggest that it is the percentage of time the primary 80 MHz channel is busy while CCA indicates busy. The only definition in the spec for "primary 80 MHz channel busy" is CCA(BUSY, {primary}) or CCA(BUSY, {secondary}) or CCA(BUSY,{secondary40}). So the formula is really saying

time(CCA(BUSY, {primary})+CCA(BUSY, {secondary})+CCA(BUSY,{secondary40}))

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time(CCA(BUSY,{primary})+CCA(BUSY,{secondary})+CCA(BUSY,{secondary40}+CCA(BUSY,{secondary80}),

which is really the percentage of time the primary 80 MHz channel is busy relative to the time any of the subchannels are busy.”

In “22.3.19.5.3 CCA sensitivity for signals occupying the primary 20 MHz channel”,

“The PHY shall issue a PHY-CCA.indication(BUSY, {primary}) if one of the conditions listed in Table 22-27 (Conditions for CCA BUSY on the primary 20 MHz) is met in an otherwise idle 20 MHz, 40 MHz, 80 MHz, 160 MHz or 80+80 MHz operating channel width.”



In the case that an operating channel is 80Mhz or above, according to table Table 22-27 “Conditions for CCA BUSY on the primary 20 MHz,” the PHY shall issue a PHY-CCA.indication(BUSY, {primary}), when “The start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above -76 dBm. “.

That is if the operating channel is 80Mhz and the signal level is above -76 dBm in the primary 80MHz channel, the PHY shall issue a PHY-CCA.indication(BUSY, {primary}.

It is clear that the original definition is vague.

As for the last part of the comments, “It is not clear how a STA benefits from this information”, it is really up to an impmentor how to take advantage of this information.

**Proposed Response:**

Counter

**Proposed Resolution Text:**

Revising the following sentence

“ …where Tcca\_busy is the number of microseconds during which the CS mechanism, as defined in 9.3.2.2 (CS mechanism), has indicated a channel busy condition.

where Tcca\_busy is the number of microseconds during which the CS mechanism for primanry 20 MHz, as defined in 9.3.2.2 (CS mechanism), has indicated a channel busy condition. “

Replaing

T40, busy, T80, busy, T460, busy and are defined to be the number of microseconds during which the AP was transmitting a 40 MHz PPDU t o a VHT STA, 80 MHz PPDU, or a 160 MHz PPDU respectively.”

With

T40, busy, the start of a 40 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz

channel at or above -79 dBm. The start of an HT PPDU under the conditions defined in 20.3.21.5 (CCA sensitivity).

T80, busy, the start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz

channel at or above -76 dBm.

T160, busy , the start of a 160 MHz or 80+80 MHz non-HT duplicate or VHT PPDU at or

above -73 dBm.

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7247 | 102.03 | 3 | 8.4.2.162 | Clarify N\_max\_SS | Replace "N\_max\_SS is the maximum number of spatial streams" with "N\_max\_SS is the maximum number of spatial streams supported by the AP" |

**Discussion:**

The proposed editorial change makes the sentence more clear.

**Proposed Response:**

Agree.

**Proposed Resolution Text:**

Replace "N\_max\_SS is the maximum number of spatial streams" with "N\_max\_SS is the maximum number of spatial streams supported by the AP"

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7248 | 102.19 | 19 | 8.4.2.162 | What is the reserved value of the Spatial Stream Underutilization field?It seems all values 0-255 are currently allowed. How does the AP report that no measurement could be made because T\_busy is 0? | Specify reserved value |
| 7249 | 102.54 | 54 | 8.4.2.162 | What is the reserved value of the 40 MHz Utilization, 80 MHz Utilization and 160 MHz Utilization fields?How does the AP report that no measurement could be made because T\_cca\_busy is 0? | Specify reserved value |

**Discussion:**

[7248]

The latest draft says, “If T\_busy is 0, the Spatial Stream Underutilization field is reserved.”, but failed to specifed a value.

[7249]

The latest draft says, “If T\_cca\_\_busy is 0, the 40 MHz Utilization, 80 MHz Utilization and 160 MHz Utilization fields are reserved.”, but but failed to specifed a value.

**Proposed Response:**

Counter.

Propse to use 255 to indicate T\_..\_busy is 0 and make 254 as 100%.

**Proposed Resolution Text:**

If T\_busy is 0, the Spatial Stream Underutilization field is ~~reserved~~ set to 255. If the Spatial Stream Underutilization is 100%, then the value is set to 254.

If T\_cca\_\_busy is 0, the 40 MHz Utilization, 80 MHz Utilization and 160 MHz Utilization fields are ~~reserved~~ set to 255. If the 40 MHz Utilization, 80 MHz Utilization and 160 MHz Utilization is 100%, then the value is set to 254.

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7228 | 96.08 | 8 | 8.4.2.160.2 | I can imagine why TX VHT-MCS Map is required e.g. for link adaptation. But from VHT sounding protocol in 9.31.5, no STA will check SU Beamformer Capable. A VHT beamformee will accepted NDP Announcement that is addressed to it. | Remove "SU Beamformer Capable" otherwise give me the reason why "SU Beamformer Capable" is required.The same change or reason should be also applied to "MU Beamforming Capable". |

**Discussion:**

This bit is helpful for an STA to choose to associate with a “beamformer capable” AP if the STA is beamforming capable.

**Proposed Response:**

Reject

**Proposed Resolution Text:**

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7246 | 97.36 | 36 | 8.4.2.160.1 | Definition of "Compressed Steering number of beamformer Antennas Supported" needs further conditions for MU-capable STA | In the case of MU capable STA, the value of the field should be the minimum of N\_STS,total and the max # streams the STA can receive in an NDP - since there is no requirement that these values are actually the same |

**Discussion:**

“Compressed Steering number of beamformer Antennas Supported” is defned as follows;

“The definition of the The maximum number of space-time streams that the STA can receive in a VHT NDP, the maximum value for **NSTS,total** that can be sent to the STA in a VHT MU PPDU if the STA is MU beamformee capable and the maximum value of **Nr** that the STA transmits in a VHT Compressed Beamforming frame.”

In section 22.3.11.2, page 314, line 6-7.

“The beamformee shall generate the beamforming feedback matrices with the number of rows (Nr ) equal to the NSTS of the NDP.”

The spec does require the two number are the same.

**Proposed Response:**

Reject

**Proposed Resolution Text:**

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7384 | 97.36 | 36 | 8.4.2.160.2 | "Compressed Steering Number of Beamformer Antennas Supported" field name does not match definition/encoding | Come up with a better name for the field  |

**Discussion:**

The name and definition are inherent from 11n “Transmit Beamforming Capabilities field”.

**Proposed Response:**

Reject

**Proposed Resolution Text:**

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Changes** |
| 7204 | 98.11 | 11 |  | The describition for TXOP Power Save Mode for a non-AP STA sounds like it reports its current operating mode. Is the expectation that the STA changes is its TXOP Power Save behavior after association? If so, how does this get signaled to the AP (I don't see any description for this)? It is not clear to me that this is even necessary (signaling operating mode). | Make the VHT TXOP PS field indicate a capability not a mode of operation. Change definition to "Indicates support for VHT TXOP Power Save. Change the encoding to "Set to 0 if not supported. Set to 1 if supported." |

**Discussion:**

Agree with the comment

**Proposed Response:**

Accept.

**Proposed Resolution Text:**

Revising the “definition”

“Indicates whether or not the AP supports VHT TXOP PowerSave Mode or whether ~~or not~~ the non-AP STA ~~has enabled~~ support VHT TXOP Power Save mode.”

Revising the “encoing”

“When transmitted by a non-AP VHT STA:

Set to 0 when the VHT STA ~~has~~ does not ~~enabled~~ support TXOP Power Save Mode.

Set to 1 when the VHT STA ~~has~~ does ~~enabled~~ support TXOP Power Save Mode.