IEEE P802.11  
Wireless LANs

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| LB190 comment resolutions on MAC CIDs in Clause 9.7 | | | | |
| Date: 2013-01-10 | | | | |
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Abstract

This document proposes resolutions for CIDs 7022, 7023, 7024, 7253 and 7285 (MAC).

Changes in the text refer to: Draft P802.11ac/D4.1 and IEEE Std 802.11-2012

1. Clause 9.7.11.1 and 9.7.11.2

Comments (CID 7022 and 7023)

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| 7022 | Brian Hart | 9.7.11.1 | 137 | 36 | T | This para relates to the interpretation of a field ... readers should not have to go to clause 9 to understand the contents of frames/elements/fields - this should all be defined in clause 8. | Move rounding language to where it belongs - i.e. clause 8 | Revised.  See editing instruction in 11-13/0067 |
| 7023 | Brian Hart | 9.7.11.2 | 138 | 3 | T | This para relates to the interpretation of a field ... readers should not have to go to clause 9 to understand the contents of frames/elements/fields - this should all be defined in clause 8. | Move rounding language to where it belongs - i.e. clause 8 | Revised.  See editing instruction in 11-13/0067 |

Discussion

In Clause 8.4.2.160.3, “Supported VHT-MCS and NSS Set field” is defined. Rx Highest Supported Long GI Data Rate Subfield and Tx Highest Supported Long GI Data Rate Subfield are defined in Table 8-183v. Data rate in Rx Highest Supported Long GI Data Rate Subfield and Tx Highest Supported Long GI Data Rate Subfield is in units of 1 Mb/s, but there is no description on how to make the data rate in units of 1 Mb/s if the highest rate is not an integer. So, the rounding language should be included in the definition in Table 8-183v.

But, the rounding language in 9.7.1.1.1 and 9.7.1.1.2 cannot be removed since the rounding language is for the data rate that is to be compared with the data rate in Rx Highest Supported Long GI Data Rate Subfield or Tx Highest Supported Long GI Data Rate Subfield, and it is not for the data rate in Rx Highest Supported Long GI Data Rate Subfield or Tx Highest Supported Long GI Data Rate Subfield itself. It describes how to handle the data rate to be compared if the rate is not an integer.

**Proposed resolution**:

Revised.

See editing instruction in 11-13/0067

**Editing Instructions**:

***Change Table 8-183v in Section 8.4.2.160.3 of TGac Draft D4.1 as follows:***

***(P4L18)***

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| * Supported VHT-MCS and NSS Set subfields | | |
| Subfield | Definition | Encoding |
| Rx VHT-MCS Map | Indicates the maximum value of the RXVECTOR parameter MCS of a PPDU that can be received at all channel widths supported by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in 8.4.2.160.3 (Supported VHT-MCS and NSS Set field  ). |
| Rx Highest Supported Long GI Data Rate | Indicates the highest long GI VHT PPDU data rate that the STA is able to receive. | In units of 1 Mb/s. If the highest long GI VHT PPDU data rate is not an integer, the data rate value is rounded down to the next integer. (see 9.7.11.1 (Rx Supported VHT-MCS and NSS Set)). The value 0 indicates that this subfield does not specify the highest long GI VHT PPDU data rate that the STA is able to receive. |
| Tx VHT-MCS Map | Indicates the maximum value of the TXVECTOR parameter MCS of a PPDU that can be transmitted at all channel widths supported by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in 8.4.2.160.3 (Supported VHT-MCS and NSS Set field  ). |
| Tx Highest Supported Long GI Data Rate | Indicates the highest long GI VHT PPDU data rate that the STA is able to transmit at. | In units of 1 Mb/s. If the highest long GI VHT PPDU data rate is not an integer, the data rate value is rounded down to the next integer. (see 9.7.11.2 (Tx Supported VHT-MCS and NSS Set)).  The value 0 indicates that this subfield does not specify the highest long GI VHT PPDU data rate that the STA is able to transmit at. |

Comments (CID 7285)

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| 7285 | Matthew Fischer | 9.7.11.1 | 137 | 39 | T | Typo. Please change <VHT-MCS,NSS> to <VHT-MCS, n> | As in comment | Revised.  See editing instruction in 11-13/0067 |

Discussion

In Clause 9.7.11.1 and 9.7.11.2, the use of <VHT-MCS, NSS> and <VHT-MCS, n> is not consistent.

**Proposed resolution**:

Revised.

See editing instruction in 11-13/0067

**Editing Instructions**:

***Change the Sentences in Section 9.7.11.1 and 9.7.11.2 of TGac Draft D4.1 as follows:***

* Rx Supported VHT-MCS and NSS Set

The Rx Supported VHT-MCS and NSS Set of a VHT STA is determined for each <VHT-MCS, NSS> tuple NSS = 1, …, 8 and bandwidth (20 MHz, 40 MHz, 80 MHz and 160 MHz or 80+80 MHz) from its Supported VHT-MCS and NSS Set field as follows:

* If support for the VHT-MCS for NSS spatial streams at that bandwidth is mandatory (see 22.5 (Parameters for VHT-MCSs)), then the <VHT-MCS, NSS> tuple at that bandwidth is supported by the STA on receive.
* Otherwise, if the Max VHT-MCS For *n* SS (*n* = NSS) subfield in the Rx VHT-MCS Map field indicates support and the Rx Highest Supported Long GI Data Rate subfield is equal to 0, then the <VHT-MCS, NSS*>* tuple at that bandwidth is supported by the STA on receive.
* Otherwise, if the Max VHT-MCS For *n* SS (*n* = NSS) subfield in the Rx VHT-MCS Map subfield indicates support and the data rate (expressed in megabits per second) for long GI of the MCS for NSS spatial streams at that bandwidth (if the data rate is not an integer, the data rate value is rounded down to the next integer) is less than or equal to the rate represented by the Rx Highest Supported Long GI Data Rate subfield, then the <VHT-MCS, NSS > tuple at that bandwidth is supported by the STA on receive.
* Otherwise the <VHT-MCS, NSS> tuple at that bandwidth is not supported by the STA on receive.

The <VHT-MCS, NSS> tuples excluded by 9.7.11.3 (Additional rate selection constraints for VHT PPDUs) are also eliminated from the Rx Supported VHT-MCS and NSS Set those tuples.

A VHT STA shall not, unless explicitly stated otherwise, transmit a VHT PPDU unless the <VHT-MCS, NSS> tuple and bandwidth used are in the Rx Supported VHT-MCS and NSS Set of the receiving STA(s).

NOTE—Support for a <VHT-MCS, NSS> tuple at a given bandwidth implies support for both long GI and short GI on receive, if short GI is supported at that bandwidth.

* Tx Supported VHT-MCS and NSS Set

The Tx Supported VHT-MCS and NSS Set of a VHT STA is determined for each <VHT-MCS, NSS> tuple NSS = 1, …, 8 and bandwidth (20 MHz, 40 MHz, 80 MHz and 160 MHz or 80+80 MHz) from its Supported VHT-MCS and NSS Set field as follows:

* If support for the <VHT-MCS, NSS> tuple at that bandwidth is mandatory (see 22.5 (Parameters for VHT-MCSs)), then the <VHT-MCS, NSS> tuple at that bandwidth is supported by the STA on transmit.
* Otherwise if the Max VHT-MCS for *n* SS (*n* = NSS) subfield in the Tx VHT-MCS Map subfield indicates support and the Tx Highest Supported Long GI Data Rate subfield is equal to 0, then the <VHT-MCS, NSS> tuple at that bandwidth is supported by the STA on transmit.
* Otherwise if the Max VHT-MCS for *n* SS (*n* = NSS) subfield in the Tx VHT-MCS Map subfield indicates support and the data rate (expressed in megabits per second) for long GI of the <VHT-MCS, NSS>(#7006) tuple at that bandwidth (if the data rate is not an integer, the data rate value is rounded down to the next integer) is less than or equal to the rate represented by the Tx Highest Supported Long GI Data Rate subfield, then the <VHT-MCS, NSS>(#7006) tuple at that bandwidth is supported by the STA on transmit.
* Otherwise the <VHT-MCS, NSS>(#7006) tuple at that bandwidth is not supported by the STA on transmit.

NOTE—Support for short GI on transmit cannot be determined.

1. Clause 9.7.11.3

Comments (CID 7024)

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| **CID** | **Commenter** | **Clause** | **Page** | **Line** | **Type** | **Comment** | **Proposed Change** | **Proposed**  **Resolution** |
| 7024 | Brian Hart | 9.7.11.3 | 138 | 12 | T | The work in this section needs a PICS entry | Add | Revised.  See editing instruction in 11-13/0067 |

Discussion

PICS entry related to 9.7.11 Rate selection constraints for VHT STAs is not explicitly included in the current spec.

**Proposed resolution**:

Revised.

Add PICS entry related to 9.7.11 Rate selection constraints for VHT STAs.

See editing instruction in 11-13/0067

**Editing Instructions**:

***Change B.4.4.1 MAC protocol capabilities in IEEE Std 802.11-2012 as follows: (Page 1792, 2nd Row in the table, under PC9)***

|  |  |  |  |  |
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| B.4.4.1 MAC protocol capabilities *(continued)* | | | | |
| Item | Protocol capability | References | Status | Support |
| … | …. | ….. | … | …. |
| PC8.2 | StrictlyOrdered service class | 9.8 | O | Yes  No  |
| PC9  PC9.1  PC9.2 | Multirate support  Rate selection using Rx Supported VHT-MCS and NSS Set / Tx Supported VHT-MCS and NSS Set  Cropping of VHT Basic MCS Set | 9.7,  Annex J  9.7.11.1, 9.7.11.2  9.7.11.3 | M  CF29:M  CF29:O | Yes  No   Yes  No N/A   Yes  No N/A  |
| ….. | ………… | …… |  | …… |

1. Clause 9.7.10

Comments (CID 7024)

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| 7253 | Sigurd Schelstraete | 9.7.10 | 136 | 62 | T | Is it allowed for an RTS to include CH\_BANDWIDTH\_IN\_NON\_HT but not DYN\_BANDWIDTH\_IN\_NON\_HT? Current requirements only state that:  1. A VHT STA that includes DYN\_BANDWIDTH\_IN\_NON\_HT shall also include CH\_BANDWIDTH\_IN\_NON\_HT.  2. A VHT STA shall not include DYN\_BANDWIDTH\_IN\_NON\_HT for frames other than RTS.  Since TA signaling only signals the presence of information in the scrambler sequence, it is important to know for all cases which parameters are present. Currenlty, it looks like there may be an ambiguity at the receiver about the presence of the DYN\_BANDWIDTH\_IN\_NON\_HT in an RTS frame. | Clarify. Should there be an additonal requirement "RTS frames shall include DYN\_BANDWIDTH\_IN\_NON\_HT"? | Revised.  See editing instruction in 11-13/0067. |

Discussion

In 9.7.10, following are specified:

1. “A non-VHT STA shall include neither the CH\_BANDWIDTH\_IN\_NON\_HT parameter nor the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in either of the Clause 18 TXVECTOR or RXVECTOR” 🡪 It means that DYN\_BANDWIDTH\_IN\_NON\_HT is only used by VHT STA
2. “A VHT STA shall include neither the CH\_BANDWIDTH\_IN\_NON\_HT parameter nor the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in the Clause 22 TXVECTOR of a non-HT PPDU addressed to a non-VHT STA.”

* It means that a DYN\_BANDWIDTH\_IN\_NON\_HT can be used for only VHT STA 🡪 VHT STA

1. A VHT STA shall not include the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in the TXVECTOR for transmitted frames other than RTS frames with bandwidth signaling TA and that are sent in a non-HT PPDU

* It means that the DYN\_BANDWIDTH\_IN\_NON\_HT is only used by VHT STA 🡪 VHT STA and only included in RTS in a non-HT PPDU (which is transmitted by a VHT STA) with CH\_BANDWIDTH\_IN\_NON\_HT

In 8.3.1.2 RTS format, it is specified that

1. “The TA field is the address of the STA transmitting the RTS frame or a bandwidth signaling TA. The TA field is set to a bandwidth 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)).”

* It means that if bandwidth signaling TA is used in an RTS frame transmitted by a VHT STA in a non-HT or non-HT duplicate format, it means CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT is included in the RTS frame.

Therefore, it is not allowed for an RTS to include CH\_BANDWIDTH\_IN\_NON\_HT but not DYN\_BANDWIDTH\_IN\_NON\_HT.

If a VHT STA receives a non-HT duplicate RTS from other VHT STA with a bandwidth signalling, then DYN\_BANDWIDTH\_IN\_NON\_HT is included in the RTS frame.

In other cases, DYN\_BANDWIDTH\_IN\_NON\_HT is not included in the received frame.

So, based on the current spec, there is no ambiguity at the receiver about the presence of the DYN\_BANDWIDTH\_IN\_NON\_HT. Requirements for RTS frame with DYN\_BANDWIDTH\_IN\_NON\_HT are already included in the current spec.

**Proposed resolution**:

Revised

A non-VHT STA shall include neither the CH\_BANDWIDTH\_IN\_NON\_HT parameter nor the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in either of the Clause 18 TXVECTOR or RXVECTOR. A non-VHT STA shall not set the TA field to a bandwidth signaling TA. A VHT STA shall include neither the CH\_BANDWIDTH\_IN\_NON\_HT parameter nor the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in the Clause 22 TXVECTOR of a non-HT PPDU addressed to a non-VHT STA. A VHT STA shall not set the TA field to a bandwidth signaling TA in a frame addressed to a non-VHT STA. A VHT STA that includes the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in the TXVECTOR shall also include the CH\_BANDWIDTH\_IN\_NON\_HT parameter in the TXVECTOR. A VHT STA shall not include the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in the TXVECTOR for transmitted frames other than RTS frames with bandwidth signaling TA and that are sent in a non-HT PPDU. A STA that transmits an RTS frame with a bandwidth signaling TA shall include the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in the TXVECTOR. A VHT STA shall include both the CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT parameters in the Clause 18 RXVECTOR.