IEEE P802.11  
Wireless LANs

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| D3 Comment Resolution, brianh, part 1 | | | | |
| Date: 2012-07-17 | | | | |
| Author(s): | | | | |
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##### Baseline is 11ac D3.0. Changes indicated by a mixture of Word track-changes and instructions. For equation changes, Latex notation is sometimes used. E.g. a\_{xyz}^b denotes axyzb

PHY CIDs addressed in D1: 6125, 6126, 6473, 6315, 6490, 6186, 6073

COEX CID addressed in D2: 6312

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| 6125 | Liwen Chu | 170.36 | 18.2.2.7 | Add the following text to the end of the note "The CH\_BANDWIDTH\_IN\_NON\_HT parameter is not present when the frame is transmitted by a VHT STA to a non-VHT STA (see 9.7.10 (Channel Width in non-HT and non-HT duplicate PPDUs))." | As in comment | Revised. See changes under CID 6125 in 12/801<motioned-Revision#>, which implement much the same as the commeter requested |
| 6126 | Liwen Chu | 170.47 | 18.2.2.8 | Add the following text to the end of the note "The DYN\_BANDWIDTH\_IN\_NON\_HT parameter is not present when the frame is transmitted by a VHT STA to a non-VHT STA (see 9.7.10 (Channel Width in non-HT and non-HT duplicate PPDUs))." | As in comment | Revised. See changes under CID 6125 in 12/801<motioned-Revision#>, which implement much the same as the commeter requested |

***Discussion:***

Agree with commenter that this is a helpful observation; I’ve just made editorial changes to not add duplicate references. The reference is complete and correct:

**9.7.10 Channel Width in non-HT and non-HT duplicate PPDUs**

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 sent to a non-VHT STA. A VHT STA shall not set the TA field

to a signaling TA in a frame sent 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 include both the

CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT parameters in the Clause 18

RXVECTOR.

***Change:***

**18.2.2.7 TXVECTOR CH\_BANDWIDTH\_IN\_NON\_HT**

If present, the allowed values for CH\_BANDWIDTH\_IN\_NON\_HT are CBW20, CBW40, CBW80,

CBW160 and CBW80+80. If present, this parameter is used to modify the first 7 bits of the scrambling sequence

to indicate the duplicated bandwidth of the PPDU.

NOTE—The CH\_BANDWIDTH\_IN\_NON\_HT parameter is not present when the frame is transmitted by a non-VHT

STA. The CH\_BANDWIDTH\_IN\_NON\_HT parameter is not present when the frame is transmitted by a VHT STA to a non-VHT STA (see 9.7.10 (Channel Width in non-HT and non-HT duplicate PPDUs)).

**18.2.2.8 TXVECTOR DYN\_BANDWIDTH\_IN\_NON\_HT**

If present, the allowed values for DYN\_BANDWIDTH\_IN\_NON\_HT are Static and Dynamic. If present,

this parameter is used to modify the first 7 bits of the scrambling sequence to indicate if the transmitter is

capable of Static or Dynamic bandwidth operation. If DYN\_BANDWIDTH\_IN\_NON\_HT is present, then

CH\_BANDWIDTH\_IN\_NON\_HT is also present.

NOTE—The DYN\_BANDWIDTH\_IN\_NON\_HT parameter is not present when the frame is transmitted by a non-

VHT STA. The DYN\_BANDWIDTH\_IN\_NON\_HT parameter is not present when the frame is transmitted by a VHT STA to a non-VHT STA (see 9.7.10 (Channel Width in non-HT and non-HT duplicate PPDUs)).

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| 6312 | Brian Hart | 171.14 | 18.2.3 | As written CH\_BANWIDTH\_IN\_NON\_HT doesn't return CBW160 or CBW80+80 as distinct values, it returns a single value that represents "CBW160 or CBW80+80" | Try "CBW20, CBW40, CBW80 or CBW160/CBW80+80". Ditto P171L27 with likely knock effects at P173L65. A different approach is to use the PHY's knowledge of whether it is operating in a 160 or 80+80 MHz BSS; if so, needs extra language, especially if the BSS is actually 20/40/80 MHz! | Revised. See changes under CID 6312 in 12/801<motioned-Revision#>, which implement much the same as the commeter requested |

***Discussion***:

The commenter has a valid concern. In the comment resolution below, we follow the commeter’s latter path, to keep the MAC work simple.

Helpful work is also undertaken under CIDs 6808 and 6552 in 12/847r1., specifically

“--A STA shall not transmit a frame using a value for the CH\_BANDWIDTH parameter of the

TXVECTOR that is not supported by the receiver STA, as reported in any HT Capabilities element or VHT Capabilities element received from the intended receiver.”

**Table 8-103—Capabilities field**

|  |  |  |
| --- | --- | --- |
| 61 | TDLS Wider Bandwidth | The TDLS Wider Bandwidth subfield indicates whether the STA supports a wider bandwidth than the BSS bandwidth for a TDLS direct link on the base channel. The field is set to 1 to indicate that the STA supports a wider bandwidth on the base channel and to 0 to indicate that the STA does not support a wider bandwidth on the base channel.A 160 MHz bandwidth is defined to be identical to a 80+80 MHz bandwidth (i.e. one is not wider than the other) |

**10.22.1 General**

***Change the 5th paragraph of 10.22.1 and insert a subsequent paragraph as follows:***

Features that are not supported by the BSS but that are supported by both TDLS peer STAs may be used on

a TDLS direct link between those STAs, except PCO. An example is the use of an HT MCS on a TDLS

direct link between HT STAs when these STAs are associated with a non-HT BSS. Features that are supported

by the BSS shall follow the BSS rules when they are used on a TDLS direct link on the base channel.

The channel width of the TDLS direct link on the base channel shall not exceed the channel width of the

BSS to which the TDLS peer STAs are associated, except when the TDLS Wider Bandwidth subfield in the

Extended Capabilities element of the TDLS Setup Request frame or the TDLS Setup Response frame is 1

for both TDLS peer STAs. A TDLS direct link on the base channel shall not have a wider bandwidth than the

BSS bandwidth if either of the STAs indicate that they are incapable of supporting wider bandwidth operation on the base channel.

A VHT STA with a TDLS link that is not an off-channel link, shall use the HT BSS primary channel as its

primary channel. The channel width of a VHT TDLS link shall not be wider than the maximum channel

width supported by either the TDLS initiator STA or the TDLS responder STA.

A 160 MHz bandwidth is defined to be identical to a 80+80 MHz bandwidth (i.e. one bandwidth is not wider than the other).

A STA shall not participate in a TDLS direct link with the same primary 80 MHz channel as the infrastructure BSS or another TDLS direct link of the STA but with a different secondary 80 MHz channel.

***Insert a new subclause 10.22.6.4 following 10.22.6.3 as follows:***

**10.22.6.4.3 Channel selection for a wideband off-channel direct link**

If a TDLS peer STA chooses to start a wideband direct link, it shall follow the primary channel selection rules

as defined in 10.39.2 (Channel selection methods for a VHT BSS) and 10.23.14 (Channel usage procedures) and the secondary 80 MHz channel rule defined in 10.22.1 (General).

***Table 22-20 – reserved***

***Change***:

**Table 18-6a—Contents of the first 7 bits of the Scrambling Sequence**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **First 7 bits of Scrambling Sequence** | | |
| **B0 B3** | **B4** | **B5 B6** |
| RXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NOT\_HT are present in RXVECTOR | - | DYN\_BANDWIDTH\_IN\_NON\_HT | CBW\_IN\_NON\_HT\_TEMP (see Table 18-6b-yyyy) |

During reception by a VHT STA, the CBW\_IN\_NON\_HT\_TEMP variable shall be set to selected bits in the scrambling sequence as shown in Table 18-6a, then mapped as shown in Table 18-6b-yyyy to the CH\_BANDWIDTH\_IN\_NON\_HT parameter in RXVECTOR. During reception by a VHT STA, the DYN\_BANDWIDTH\_IN\_NON\_HT parameter in RXVECTOR shall be determined according to Table 18-6c using selected bits in the scrambling sequence as shown in Table 18-6a. The fields in Table 18-6a shall be interpreted as being sent LSB-first.

**Table 18-6b—TXVECTOR CH\_BANDWIDTH\_IN\_NON\_HT values**

|  |  |
| --- | --- |
| **Enumerated value** | **Value** |
| CBW20 | 0 |
| CBW40 | 1 |
| CBW80 | 2 |
| CBW160 or CBW80+80 | 3 |

**Table 18-6b-yyyy—Determination of RXVECTOR CH\_BANDWIDTH\_IN\_NON\_HT**

|  |  |  |
| --- | --- | --- |
| CBW\_IN\_NON\_HT\_TEMP (see Table 18-6a) | **dot11CurrentChannelCenterFrequencyIndex1** | **RXVECTOR CH\_BANDWIDTH\_IN\_NON\_HT** |
| 0 | 0 | CBW20 |
| 1 | 0 | CBW40 |
| 2 | 0 | CBW80 |
| 3 | 0 | CBW160 |
| 3 | 1 to 200 | CBW80+80 |

**Table 22-22—Fields to specify VHT channels**

|  |  |
| --- | --- |
| **Field** | **Meaning** |
| dot11CurrentChannelCenterFrequencyIndex1 | In 80+80 MHz channels, denotes the center frequency of the frequency segment 1, which is the frequency segment that does not contain the primary channel.  Valid range is 1 to 200.  See Equation (22-101).  In 20 MHz, 40 MHz, 80 MHz and 160 MHz channels, set to zero. |

**C.3 MIB Detail**

dot11CurrentChannelCenterFrequencyIndex1 OBJECT-TYPE

SYNTAX Unsigned32 (0..200)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a status variable.

In 80+80 MHz channels, denotes the center frequency of frequency segment

1.

Set to 0 for 20 MHz, 40 MHz, 80 MHz and 160 MHz channels. See 22.3.14

(Channelization)."

DEFVAL { 0 }

::= { dot11PhyVHTEntry 4 }

|  |  |  |  |  |  |  |
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| 6473 | Mark RISON | 173.50 | 18.3.5.5 | What does "validity" mean? It can be misinterpreted as "have been set correctly by the peer" | Change to "presence of [...] presence". Similarly at 187.41 | Revised. See changes under CID 6473 in 12/801<motioned-Revision#>, which clarify both validity and presence |

***Discussion:***

Note that “validity” always characterizes the RXVECTOR parameter so there is no ambiguity. And the parameters are always present in the RXVECTOR created by a VHT PHY processing a non-HT PPDU so “presence” is not the right direction. However, this point does seem to be a subtle one that is likely to cause confusion, so let’s add further clarifying information.

***Change:***

NOTE 1—The receiving PHY cannot determine whether the CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT parameters were present in the TXVECTOR of the transmitting PHY, and so the receiving PHY in a VHT STA always includes values for the CH\_BANDWIDTH\_IN\_NON\_HT and

DYN\_BANDWIDTH\_IN\_NON\_HT parameters in the Clause 18 RXVECTOR. It is the responsibility of the MAC to determine if these parameters were present in the TXVECTOR of the transmitting PHY, and hence the validity of the CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT parameters in the RXVECTOR.

|  |  |  |  |  |  |  |
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| 6315 | Mitsuru Iwaoka | 310.04 | 22.6.4.3 | PMD\_NON\_HT\_CH\_BANDWIDTH is defined in Table 22-63. But this primitive had been removed (Ref: 11/12-0503r4). | Remove PMD\_NON\_HT\_CH\_BANDWIDTH from Table 22-63. | Accepted |
| 6490 | Mark RISON | 310.04 | 22.6.4.3 | PMD\_NON\_HT\_CH\_BANDWIDTH is not mentioned anywhere other than in the table of PMD SAP primitives | Delete the row | Accepted |

***Discussion:*** Superseded by PMD\_CBW

***Context:***

**22.6.5.13 PMD\_CBW.indication**

**22.6.5.13.1 Function**

This primitive, generated by the PMD sublayer, provides an estimate of the bandwidth of the received PPDU

to the PLCP.

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| --- | --- | --- | --- | --- | --- | --- |
| 6186 | Youhan Kim | 311.29 | 22.6.4.4 | Elsewhere (e.g. TXVECTOR/RXVECTOR, waveform equations in Clause 22), u ranges from 0 to NUM\_USERS - 1. Any reason to differ here? | Change "u takes values 1 to NUM\_USERS" to "u takes values 0 to NUM\_USERS - 1". Ditto on P311L60. | Accepted |

***Discussion:***

Agreed – 0 to NUM\_USERS-1 is used elsewhere. Contrast:

**Table 22-1—TXVECTOR and RXVECTOR parameters**

MU indicates that the parameter is present once for an SU PPDU and present per user for an MU PPDU. Parameters

specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u* takes values

0 to NUM\_USERS-1.

with

**Table 22-64—List of parameters for PMD primitives**

NOTE—These parameters are present for one user for an SU PPDU and present per user for an MU PPDU.They are

conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to NUM\_USERS-1.

**22.6.5.2 PMD\_DATA.request**

**22.6.5.2.1 Function**

This primitive defines the transfer of data from the PLCP sublayer to the PMD entity.

**22.6.5.2.2 Semantics of the service primitive**

This primitive shall provide the following parameters: PMD\_DATA.request (TXD\_UNIT)

The TXD\_UNIT parameter shall be the n-bit combination of 0 and 1 for one symbol of OFDM modulation.

If the length of a C-PSDU is shorter than n bits, bits with value 0 are added at the end of the C-PSDU to form

an OFDM symbol. This parameter represents a single block of data that, in turn, shall be used by the PHY to

be encoded into an OFDM transmitted symbol.

The TXD\_UNIT parameter is present for one user for an SU PPDU and present per user for an MU PPDU.

It is conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to NUM\_USERS-1.

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| 6073 | Adrian Stephens | 311.54 | 22.6.5.2.2 | "If the length of a C-PSDU is shorter than n bits, bits with value 0 are added at the end of the C-PSDU to form an OFDM symbol."    Not so. Padding is done in the PLCP prior to scrambling and coding (see figure 22-32). | Remove cited sentence. | Accepted |

***Discussion:***

Agreed – see also for instance

**22.3.10.5.2 BCC encoder parsing operation**

If multiple encoders are used, the scrambled SERVICE, PSDU and PHY pad bits are divided between the

encoders by sending bits to different encoders in a round robin manner.

***Context:***

22.6.5.2 PMD\_DATA.request

22.6.5.2.1 Function

This primitive defines the transfer of data from the PLCP sublayer to the PMD entity.

22.6.5.2.2 Semantics of the service primitive

This primitive shall provide the following parameters: PMD\_DATA.request (TXD\_UNIT)

The TXD\_UNIT parameter shall be the n-bit combination of 0 and 1 for one symbol of OFDM modulation.

This parameter represents a single block of data that, in turn, shall be used by the PHY to

be encoded into an OFDM transmitted symbol.

