IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | CR 24235 24236 PSR 20 MHz Normalization | | | | | | Date: 2020-02-24 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Matthew Fischer | Broadcom |  |  | [Matthew.fischer@broadcom.com](mailto:Matthew.fischer@broadcom.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

Proposed language to address TGaxD6.0 WG LB247 CIDs on PSR 20 MHz normalization description for CIDs 24235 and 24236.

Proposed changes are referenced to TGax D6.0.

**REVISION NOTES:**

**R0**:

initial

**R1**:

Added a definition for log (x), made use consistent

Add exception for OBSS\_PD operation to not include DSSS and CCK PSDUs

Change PPDU\_BW to PSDU\_BW

Several and various editorial changes, e.g. spaces around “/” symbol, insert a comma, less than or equal to phrasing, etc.

Updated doc references

**R2**:

Simplified the spatial reuse exlusion list addition to simply DATARATE is one of 1, 2, 5.5, 11 – note that this had not been done earlier because clause 16 does not actually explicitly call out these values, while 15 calls out only 1 and 2, but a reread of 16 seems to allow any value as appropriate, hence 5.5 and 11 are implicit.

Change PSDU\_BW to PPDU\_BW and generally fix other PSDU v PPDU stuff. Note that the use of PSDU instead of PPDU was an R1 change that was prompted by the suggestion that the thing transferred between MAC and PHY must be a PSDU, and therefore, any behaviour of the MAC that depends on receipt of something from the PHY should be referencing a PSDU, but this is not exactly true in this case, as the thing that is being used by the MAC is the RXVECTOR which is sent from the PHY in response to the PHY’s receipt of a PPDU, and whose parameters correspond to that PPDU and not to a PSDU and therefore, the “receive” operations in these locations is an implicit reference to the PHY reception of that PPDU as inferred by the MAC receipt of the RXVECTOR within the PHY-RXSTART.indication and not a reference to the receipt by the MAC of a PSDU thereby confirming that PPDU is the correct term.

Added punctured BW values in the PPDU\_BW value determination table. (see 60 MHz and 140 MHz values)

Updated doc references

**END OF REVISION NOTES**

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

**CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution (Proposed)** |
| 24235 | Wilhelmsson, Leif | 26.10.3.2 | 426.10 | The description of how things are normalized to 20 MHz becomes nicer if the formula is spelled out as on p. 420 l.35 | Rephrase how the normalization is done in the same was as on p. 420, l. 35 | Revise – Tgax editor to make the changes marked with CID 24235 in 11-20-0529r2 which generally agree with the commenter’s suggestion to rewrite the description of the calculation of the spatial reuse value and in consequence, affecting the description of the calculation of the OBSS\_PDLevel value. |
| 24236 | Wilhelmsson, Leif | 26.10.3.4 | 427.39 | The description of how things are normalized to 20 MHz becomes nicer if the formula is spelled out as on p. 420 l.35 | Rephrase how the normalization is done in the same was as on p. 420, l. 35 | Revise – Tgax editor to make the changes marked with CID 24236 in 11-20-0529r2 which generally agree with the commenter’s suggestion to rewrite the description of the calculation of the spatial reuse value. |

**Discussion:**

**Proposed Changes to TGax D6.0:**

**CID 24235, 24236:**

***TGax editor: in an appropriate location within TGax D6.0, add the following new text and editing instructions:***

**1.5 Terminology for mathematical, logical, and bit operations**

***Insert the following mathematical operation before the operation log2 (x):***

log (*x*) is the logarithm of *x* to the base 10. For example, log (100) is 2. **(#24236)**

***TGax editor: within subclause 26.10.2.2 General operation with non-SRG OBSS PD level within TGax D6.0, change the text as shown:***

**26.10.2.2 General operation with non-SRG OBSS PD level**

— The PPDU is not one of the following:

• A non-HE PPDU that carries a frame where the RA field is equal to the STA MAC address

• A non-HE PPDU that carries a Public Action frame

• A non-HE PPDU that carries a VHT/HE NDP Announcement frame or Fine Timing Measurement frame

• A non-HE NDP

* The PPDU is not received with a value of 1, 2, 5.5 or 11 for the DATARATE parameter of the RXVECTOR. **(#24236)**

***TGax editor: within subclause 26.10.2.3 General operation with SRG OBSS PD level within TGax D6.0, change the text as shown:***

**26.10.2.3 General operation with SRG OBSS PD level**

— The PPDU is not one of the following:

• A non-HE PPDU that carries a frame where the RA field is equal to the STA MAC address

• A non-HE PPDU that carries a Public Action frame

• A non-HE PPDU that carries a VHT/HE NDP Announcement frame or Fine Timing Measurement frame

• A non-HE NDP

* The PPDU is not received with a value of 1, 2, 5.5 or 11 for the DATARATE parameter of the RXVECTOR. **(#24236)**

***TGax editor: within TGax D6.0, in subclause in 26.10.2.4 Adjustment of OBSS PD and transmit power, change the text as shown and insert a new table as shown:***

**26.10.2.4 Adjustment of OBSS PD and transmit power**

The value of the *OBSS\_PDlevel* is applicable to the start of a 20 MHz PPDU received on the primary 20 MHz channel. If the PPDU\_BW of the received PPDU differs from 20 MHz, then the value of the *OBSS\_PDlevel* is increased by 10 log (PPDU\_BW / 20 MHz) dB, where PPDU\_BW is determined from Table 26-xxyy (PPDU\_BW value determination) using the RXVECTOR parameter CH\_BANDWIDTH or CH\_BANDWIDTH\_IN\_NON\_HT of the received PPDU, whichever is present. **(#24235)(#24236)**

**Table 26-xxyy PPDU\_BW value determination (#24235)(#24236)**

|  |  |
| --- | --- |
| **CH\_BANDWIDTH or CH\_BANDWIDTH\_IN\_NON\_HT** | **PPDU\_BW** |
| CBW20, HT\_CBW20, NON\_HT\_CBW20 | 20 MHz |
| CBW40, HT\_CBW40, NON\_HT\_CBW40 | 40 MHz |
| HE-CBW-PUNC80-PRI, HE-CBW-PUNC80-SEC | 60 MHz |
| CBW80 | 80 MHz |
| HE-CBW-PUNC160-PRI20, HE-CBW-PUNC80+80-PRI20, HE-CBW-PUNC160-SEC40, HE-CBW-PUNC80+80-SEC40 | 140 MHz |
| CBW80+80, CBW160 | 160 MHz |

***TGax editor: within TGax D6.0, in subclause in 26.10.3.2 PSR-based spatial reuse initiation, change the text as shown:***

**26.10.3.2 PSR-based spatial reuse initiation**

2) A PSRT PPDU is queued for transmission and the intended transmit power of the PSRT PPDU in dBm minus log (PPDU\_BW / 20 MHz) dB is below the value of PSR - RPL, where PPDU\_BW is determined from Table 26-xxyy (PPDU\_BW value determination) using the TXVECTOR parameter CH\_BANDWIDTH or CH\_BANDWDITH\_IN\_NON\_HT of the PSRT PPDU, whichever is present, and PSR is the value obtained from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) based on at least one of: **(#24235)**

***TGax editor: within TGax D6.0, in subclause in 26.10.3.4 UL Spatial Reuse subfield of Trigger frame, change the header and text as shown:***

**26.10.3.4 UL Spatial Reuse subfield of Trigger frames**

An AP with dot11HEPSROptionImplemented set to true that transmits a Trigger frame may determine the value of the UL Spatial Reuse subfield of the Common Info field of the Trigger frame for each 20 MHz subchannel for a 20 MHz, 40 MHz, or 80 MHz PPDU or for each 40 MHz subchannel for an 80+80 MHz or 160 MHz PPDU by selecting the row in Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) that has a numerical value in the "Meaning" column that is the highest value that is less than or equal to the value of the computed MAC parameter PSR\_INPUT as follows: **(#24236)**

PSR\_INPUT = *TX\_PWRAP* + Acceptable Receiver Interference LevelAP (26-7)

where

*TX\_PWRAP* is the total power at the antenna connector, in dBm, for that 20 MHz subchannel, over all antennas used to transmit the PSRR PPDU containing the Trigger frame for each 20 MHz subchannel for a 20 MHz, 40 MHz, or 80 MHz PPDU or in each of the 40 MHz subchannels for an 80+80 MHz or 160 MHz PPDU. **(#24236)**

Acceptable Receiver Interference LevelAP is a value in dBm for that 20 MHz subchannel for a 20 MHz, 40 MHz, or 80 MHz PPDU or for each of the 40 MHz subchannels for an 80+80 MHz or 160 MHz PPDU and should be set to value of the UL target RSSI indicated in the Trigger frame minus the minimum SNR value that yields ≤ 10% PER for the highest HE-MCS of the ensuing uplink HE TB PPDU, minus a safety margin value not to exceed 5 dB as determined by the AP. **(#24236)**

**End of proposed changes.**