IEEE P802.11  
Wireless LANs

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| Resolutions for some comments on 11ax/D6.0 (SB1) | | | | |
| Date: 2020-07-30 | | | | |
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Abstract

This submission proposes resolutions for various CIDs on 11ax/D6.0. Green indicates material agreed to in the group, yellow material to be discussed, red material rejected by the group and cyan material not to be overlooked. The “Final” view should be selected in Word.

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| Identifiers | Comment | Proposed change |
| CID 24300  Mark RISON  27.3.11.7.2  567.25 | "For 40 MHz two Spatial Reuse fields with Spatial Reuse 3 field identical in value to the Spatial  Reuse 1 field and Spatial Reuse 4 field identical in value to Spatial Reuse 2 field. The Spatial Reuse  fields only apply to the 20 MHz used for the transmission." -- shouldn't that be "in the 40 MHz", by analogy with the preceding bullet? |  |
| CID 24301  Mark RISON  27.3.11.7.2  567.25 | "For 40 MHz two Spatial Reuse fields with Spatial Reuse 3 field identical in value to the Spatial  Reuse 1 field and Spatial Reuse 4 field identical in value to Spatial Reuse 2 field. The Spatial Reuse  fields only apply to the 20 MHz used for the transmission." -- is the intent to say "respectively"? | Change to "For 40 MHz two Spatial Reuse fields with Spatial Reuse 3 field identical in value to the Spatial  Reuse 1 field and Spatial Reuse 4 field identical in value to Spatial Reuse 2 field. Each of the Spatial Reuse  fields only applies to the corresponding 20 MHz used for the transmission." |

Discussion:

The context is

The four Spatial Reuse fields, 1, 2, 3, and 4, are arranged in increasing order of frequency and correspond to:

— For 20 MHz one Spatial Reuse field corresponding to the entire 20 MHz (other 3 fields indicate identical values). The Spatial Reuse fields only apply to the 20 MHz used for the transmission.

— For 40 MHz two Spatial Reuse fields with Spatial Reuse 3 field identical in value to the Spatial Reuse 1 field and Spatial Reuse 4 field identical in value to Spatial Reuse 2 field. The Spatial Reuse fields only apply to the 20 MHz used for the transmission.

As regards CID 24300, “the 20 MHz used for the transmission” in the second bullet is confusing because the transmission is not 20 MHz wide, it is 40 MHz wide. Presumably the intent here is to refer to the 20 MHz that corresponds to each pair of Spatial Reuse fields. This is what CID 24301 intends.

Proposed changes:

Make the following changes at the referenced location:

The four Spatial Reuse fields, 1, 2, 3, and 4, are arranged in increasing order of frequency and correspond to:

— For 20 MHz one Spatial Reuse field corresponding to the entire 20 MHz (the other 3 Spatial Reuse fields indicate ~~identical~~the same value~~s~~). The Spatial Reuse fields only apply to the 20 MHz used for the transmission.

— For 40 MHz two Spatial Reuse fields with the Spatial Reuse 3 field identical in value to the Spatial Reuse 1 field and the Spatial Reuse 4 field identical in value to the Spatial Reuse 2 field. ~~The~~Each pair of Spatial Reuse fields only appl~~y~~ies to the corresponding 20 MHz used for the transmission.

Proposed resolution for CIDs 24300 and 24301:

REVISED

Make the changes shown under “Proposed changes” for CID 24300 and 24301 in <this document>, which clarify the wording for spatial reuse in 40 MHz PPDUs.

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| Identifiers | Comment | Proposed change |
| CID 24500  Mark RISON | The HE-SIG field content tables should not be in terms of what the TXVECTOR was set to at the transmitter, since this is invisible and irrelevant to the receiver. What matters is that each possible field value means. The resolution to CID 22385 claims this has all been addressed, but there are still issues at 556.50/560.39/564.21 (should be "See..."), 557.36 (should say 0 means periodicity 10, 1 means 20; see TXVECTOR blah), 557.40/562.29/566.48, 560.48, 564.38/565.28/565.53/566.30 | As it says in the comment |

Discussion:

As it says in the comment. CID 22385 did not fully address the issue.

Also, the description of the TXVECTOR parameter SPATIAL\_REUSE is inconsistent (e.g. how many elements?) and confusing (e.g. what is SPATIAL\_REUSE(1)? is SPATIAL\_REUSE(2) always present?).

In the course of developing this resolution, it was suggested that expressions like “B0-B6” might be misinterpreted as a subtraction.

Proposed changes:

Change 26.11.6 SPATIAL\_REUSE as follows:

For a PPDU with a value of HE\_TB for the TXVECTOR parameter FORMAT, the SPATIAL\_REUSE parameter contains an array of one to four values, depending on the TXVECTOR parameter CH\_BANDWIDTH. If the TXVECTOR parameter CH\_BANDWIDTH is CBW20, CBW40 or CBW80, t~~T~~he first value in the array is the SPATIAL\_REUSE parameter that applies to the lowest frequency 20 MHz subband, the second value ~~in the array~~, if present, applies to the second lowest frequency 20 MHz subband, the third value ~~in the array~~, if present, applies to the third lowest frequency 20 MHz subband and the fourth value ~~in the array~~, if present, applies to the highest frequency 20 MHz subband ~~if the CH\_BANDWIDTH parameter has the value of CBW20, CBW40 or CBW80~~. If the TXVECTOR parameter CH\_BANDWIDTH is CBW160 or CBW80+80, t~~T~~he first value in the array is the SPATIAL\_REUSE parameter that applies to the lowest frequency 40 MHz subband, the second value ~~in the array~~ applies to the second lowest frequency 40 MHz subband, the third value ~~in the array~~ applies to the third lowest frequency 40 MHz subband and the fourth value ~~in the array~~ applies to the highest frequency 40 MHz subband ~~if the CH\_BANDWIDTH parameter has the value of CBW160 or CBW80+80~~. ~~If the SPATIAL\_REUSE parameter is an array, e~~Each value in the SPATIAL\_REUSE parameter array shall individually conform to the rules in this subclause.

Make the following changes in the middle column of Table 27-1—TXVECTOR and RXVECTOR parameters, for the TXOP\_DURATION parameter:

~~Provide~~Indicates the TXOP duration ~~of TXOP~~.

Enumerated type or integer:

UNSPECIFIED indicates no NAV duration information ~~(see 26.11.5 (TXOP\_DURATION))~~. ***[delete blank line]***

0 – 8448 indicates a duration in units of 1 µs that is used to update the NAV for this TXOP (see 26.2.4 (Updating two NAVs)).

TXVECTOR parameter TXOP\_DURATION is converted to a value in the TXOP subfield of HE-SIG-A (see Table 27-18—HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU, Table 27-20—HE-SIG-A field of an HE MU PPDU and Table 27-21—HE-SIG-A field of an HE TB PPDU) as follows:

TXOP\_DURATION = UNSPECIFIED: B0-B6 = 127

TXOP\_DURATION < 512: B0 = 0, B1-B6 = floor(TXOP\_DURATION / 8) ***[editor, please use floor glyphs]***

Otherwise: B0 = 1, B1-B6 = floor((TXOP\_DURATION – 512) / 128) ***[editor, please use floor glyphs]***

RXVECTOR parameter TXOP\_DURATION is determined from the value in the TXOP subfield of HE-SIG-A (see Table 27-18—HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU, Table 27-20—HE-SIG-A field of an HE MU PPDU and Table 27-21—HE-SIG-A field of an HE TB PPDU) as follows:

B0-B6 = 127: TXOP\_DURATION = UNSPECIFIED

B0 = 0: TXOP\_DURATION = 8 × B1-B6

Otherwise: TXOP\_DURATION = 512 + 128 × B1-B6

~~When the value of the TXOP field in the HE-SIG-A of a received HE PPDU is less than 127, if B0 of the TXOP field is 0, the RXVECTOR parameter TXOP\_DURATION is set to (8 × value of B1 to B6 of the TXOP field). Otherwise, the RXVECTOR parameter TXOP\_DURATION is set to (512 + 128 × value of B1 to B6 of the TXOP field).~~

See 26.11.5 (TXOP\_DURATION) for more details.

Make the following changes in the last column of Table 27-18—HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU, for the fields shown in the leftmost column here:

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| --- | --- |
| UL/DL | Indicates whether the PPDU is sent UL or DL. Set to 1 if the PPDU is addressed to an AP. Set to 0 otherwise.  See ~~the~~ TXVECTOR parameter UPLINK\_FLAG. |
| BSS Color | ~~The BSS Color field is a~~An identifier of the BSS.  ~~Set to the value of the~~See TXVECTOR parameter BSS\_COLOR. |
| TXOP | Set to 127 to indicate no duration information ~~if TXVECTOR parameter TXOP\_DURATION is set to UNSPECIFIED~~.  Set to a value less than 127 to indicate the closest minimum bound on the duration information for NAV setting and protection of the TXOP as follows:  ~~If TXVECTOR parameter TXOP\_DURATION is less than 512, then B0 is set to 0 and B1-B6 is set to floor(TXOP\_DURATION/8).~~  ~~Otherwise, B0 is set to 1 and B1-B6 is set to floor ((TXOP\_DURATION – 512) / 128).~~  ~~where~~  ~~B0 indicates the TXOP length granularity. Set to 0 for 8 µs; otherwise set to 1 for 128 µs.~~  ~~B1-B6 indicates the scaled value of the TXOP\_DURATION~~  If B0 is 0, the TXOP duration indicated is B1-B6, in units of 8 µs.  If B0 is 1, the TXOP duration indicated is B1-B6, in units of 128 µs, plus 512 µs.  See TXVECTOR parameter TXOP\_DURATION. |

Make the following changes in the last column of Table 27-20—HE-SIG-A field of an HE MU PPDU, for the fields shown in the leftmost column here:

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| --- | --- |
| UL/DL | Indicates whether the PPDU is sent UL or DL. Set to 1 if the PPDU is addressed to an AP. Set to 0 otherwise.  See ~~the~~ TXVECTOR parameter UPLINK\_FLAG. |
| BSS Color | ~~The BSS Color field is a~~An identifier of the BSS.  ~~Set to the value of the~~See TXVECTOR parameter BSS\_COLOR. |
| Spatial Reuse | ~~Set to the value of the SPATIAL\_REUSE parameter of the TXVECTOR, which contains a~~A value from Table 27-22 (Spatial Reuse field encoding for an HE SU PPDU, HE ER SU PPDU, and HE MU PPDU) (see 26.11.6 (SPATIAL\_REUSE)) and 26.10 (Spatial reuse  operation).  See TXVECTOR parameter SPATIAL\_REUSE. |
| TXOP | Set to 127 to indicate no duration information ~~if TXVECTOR parameter TXOP\_DURATION is UNSPECIFIED~~.  Set to a value less than 127 to indicate the closest minimum bound on the duration information for NAV setting and protection of the TXOP as follows:  ~~If TXVECTOR parameter TXOP\_DURATION is less than 512, then B0 is set to 0 and B1-B6 is set to floor(TXOP\_DURATION/8).~~  ~~Otherwise, B0 is set to 1 and B1-B6 is set to floor ((TXOP\_DURATION – 512) / 128).~~  ~~where~~  ~~B0 indicates the TXOP length granularity. Set to 0 for 8 µs; otherwise set to 1 for 128 µs.~~  ~~B1-B6 indicates the scaled value of the TXOP\_DURATION~~  If B0 is 0, the TXOP duration indicated is B1-B6, in units of 8 µs.  If B0 is 1, the TXOP duration indicated is B1-B6, in units of 128 µs, plus 512 µs.  See TXVECTOR parameter TXOP\_DURATION. |

Make the following changes in the last column of Table 27-21—HE-SIG-A field of an HE TB PPDU, for the fields shown in the leftmost column here:

|  |  |
| --- | --- |
| BSS Color | ~~The BSS Color field is a~~An identifier of the BSS.  ~~Set to the value of the~~See TXVECTOR parameter BSS\_COLOR. |
| Spatial Reuse (1) | ~~Set to the value of the SPATIAL\_REUSE(1) parameter of the TXVECTOR, which contains a~~A value from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) for an HE TB PPDU (see 26.11.6 (SPATIAL\_REUSE) and 26.10 (Spatial reuse operation)).  See the first value in the TXVECTOR parameter SPATIAL\_REUSE. |
| Spatial Reuse (2) | ~~Set to the value of the SPATIAL\_REUSE(2) parameter of the TXVECTOR, which contains a~~A value from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) for an HE TB PPDU (see 26.11.6 (SPATIAL\_REUSE) and 26.10 (Spatial reuse operation)).  See the second value in the TXVECTOR parameter SPATIAL\_REUSE, if present. |
| Spatial Reuse (3) | ~~Set to the value of the SPATIAL\_REUSE(3) parameter of the TXVECTOR, which contains a~~A value from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) for an HE TB PPDU (see 26.11.6 (SPATIAL\_REUSE) and 26.10 (Spatial reuse operation)).  See the third value in the TXVECTOR parameter SPATIAL\_REUSE, if present. |
| Spatial Reuse (4) | ~~Set to the value of the SPATIAL\_REUSE(4) parameter of the TXVECTOR, which contains a~~A value from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) for an HE TB PPDU (see 26.11.6 (SPATIAL\_REUSE) and 26.10 (Spatial reuse operation)).  See the fourth value in the TXVECTOR parameter SPATIAL\_REUSE, if present. |
| TXOP | Set to 127 to indicate no duration information ~~if TXVECTOR parameter TXOP\_DURATION is UNSPECIFIED~~.  Set to a value less than 127 to indicate the closest minimum bound on the duration information for NAV setting and protection of the TXOP as follows:  ~~If TXVECTOR parameter TXOP\_DURATION is less than 512, then B0 is set to 0 and B1-B6 is set to floor(TXOP\_DURATION/8).~~  ~~Otherwise, B0 is set to 1 and B1-B6 is set to floor ((TXOP\_DURATION – 512) / 128).~~  ~~where~~  ~~B0 indicates the TXOP length granularity. Set to 0 for 8 µs; otherwise set to 1 for 128 µs.~~  ~~B1-B6 indicates the scaled value of the TXOP\_DURATION~~  If B0 is 0, the TXOP duration indicated is B1-B6, in units of 8 µs.  If B0 is 1, the TXOP duration indicated is B1-B6, in units of 128 µs, plus 512 µs.  See TXVECTOR parameter TXOP\_DURATION. |

Make the following changes in Subclause 1.4:

The construction “between *x* and *y*”, “*x* to *y*” or “*x*-*y*” represents an inclusive range (i.e., the range

includes both values *x* and *y*). The construction “B*x*-B*y*” represents bits *x* to *y*; it is not the subtraction

of bit *y* from bit *x*.

Alternative changes:

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| TXOP Granularity | Set to 1 to indicate no duration information, if the TXOP Value field is 63.  Otherwise indicates the units of the TXOP Value: 0 for 8 µs, 1 for 128 µs (with a 512 µs offset). |
| TXOP  Value | Set to ~~127~~63 to indicate no duration information, if the TXOP Granularity field is 1 ~~if TXVECTOR parameter TXOP\_DURATION is set to UNSPECIFIED~~.  ~~Set to a value less than 127 to~~Otherwise indicates the closest minimum bound on the duration information for NAV setting and protection of the TXOP as follows:  ~~If TXVECTOR parameter TXOP\_DURATION is less than 512, then B0 is set to 0 and B1-B6 is set to floor(TXOP\_DURATION/8).~~  ~~Otherwise, B0 is set to 1 and B1-B6 is set to floor ((TXOP\_DURATION – 512) / 128).~~  ~~where~~  ~~B0 indicates the TXOP length granularity. Set to 0 for 8 µs; otherwise set to 1 for 128 µs.~~  ~~B1-B6 indicates the scaled value of the TXOP\_DURATION~~  If the TXOP Granularity field is 0, the TXOP duration indicated is the TXOP Value field, in units of 8 µs.  If the TXOP Granularity field is 1, the TXOP duration indicated is the TXOP Value field, in units of 128 µs, plus 512 µs.  See TXVECTOR parameter TXOP\_DURATION. |

|  |  |
| --- | --- |
| TXOP | Set to 127 to indicate no duration information ~~if TXVECTOR parameter TXOP\_DURATION is set to UNSPECIFIED~~.  Set to a value less than 127 to indicate the closest minimum bound on the duration information for NAV setting and protection of the TXOP as follows:  ~~If TXVECTOR parameter TXOP\_DURATION is less than 512, then B0 is set to 0 and B1-B6 is set to floor(TXOP\_DURATION/8).~~  ~~Otherwise, B0 is set to 1 and B1-B6 is set to floor ((TXOP\_DURATION – 512) / 128).~~  ~~where~~  ~~B0 indicates the TXOP length granularity. Set to 0 for 8 µs; otherwise set to 1 for 128 µs.~~  ~~B1-B6 indicates the scaled value of the TXOP\_DURATION~~  Bit 0 is the TXOP Granularity subfield.  Bits 1 to 6 are the TXOP Value subfield.  If the TXOP Granularity subfield is 0, the TXOP duration indicated is the TXOP Value subfield, in units of 8 µs.  If the TXOP Granularity subfield is 1, the TXOP duration indicated is the TXOP Value subfield, in units of 128 µs, plus 512 µs.  See TXVECTOR parameter TXOP\_DURATION. |

NOTE—The TXVECTOR parameter TXOP\_DURATION can be converted to the TXOP subfield value as follows:

TXOP\_DURATION < 512: B0 = 0, B1-B6 = floor(TXOP\_DURATION / 8) ***[editor, please use floor glyphs]***

TXOP\_DURATION ≥ 512: B0 = 1, B1-B6 = floor((TXOP\_DURATION – 512) / 128) ***[editor, please use floor glyphs]***

Proposed resolution:

REVISED

Make the changes shown under “Proposed changes” for CID 24500 in <this document>, which ensure all HE-SIG-A fields are defined in terms of their meaning, although a cross-reference to the corresponding TXVECTOR parameter is given. The description of SPATIAL\_REUSE is also cleaned up, in the situations where it is an array.

Note to the commenter: the instance at 557.36 is resolved under CID 24501.

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| Identifiers | Comment | Proposed change |
| CID  Mark RISON |  |  |

Discussion:

Proposed changes:

Proposed resolution:

REVISED

Make the changes shown under “Proposed changes” for CID in <this document>, which

**References:**

802.11ax/D6.0 except where otherwise specified