IEEE P802.11
Wireless LANs

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| CC36 CR for CID 4897, 5495, and 6799 |
| Date: 2021-07-08 |
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Abstract

This submission proposes the resolution for CID 4897, 5495, and 6799. The baseline for this comment resolution document is 802.11be Draft 1.1.

* Rev 0: first draft
* Rev 1: second draft, made editorial change on Change #3.
* Rev 2: third draft, made some editorial change and revise Change #4
* Rev 3: fourth draft, made some editorial changes on Change #4

### CID 4897

Discussions:

802.11be D1.1 has included subclause 35.9 (Spatial reuse operation).

Following the same format in 11ax for this parameter, the reference to the rule for setting SPATIAL\_REUSE is also added in the description of this parameter. The subclause for the rule of using SPATIAL\_REUSE in 802.11be doesn’t exist in D1.1 and the rule in 802.11ax can’t be fully reused for EHT. Therefore, a new subclause, 35.10.zz (SPATIAL\_REUSE), to be included in 35.10 (Rules for setting some TXVECTOR parameters for PPDUs transmitted by an EHT STA) is provided in this CR.

The two descriptions of SPATIAL\_REUSE for EHT\_MU and EHT\_TB in Table 36-1 (TXVECTOR and RXVECTOR parameters) in D1.1 contradict to each other. When the FORMAT is EHT MU, there is a value for SPATIAL\_REUSE, related to the Spatial Reuse subfield in the EHT-SIG (see 36.3.12.8 in D1.1). Suggest keep the descriptions of SPATIAL\_REUSE for FORMAT EHT\_MU and EHT\_TB separate with the texts below.

**Discussion end**

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| **CID** | **Commentor** | **Clause** | **Page #** | **Comment** | **Proposed change** | **Resolution** |
| 4897 | Dong Guk Lim | 36.2.2 | 325.50 | It refers to the wrong subclause. Correct it. and add the subclause for the Spatial reuse operation in EHT | As in comment | RevisedTGbe editor: please incorporate change#1 shown in 11-21/1388r3 |

***Change #1:***

***TGbe Editor: Please incorporate the following changes in 802.11be D1.1. Table 36-1.***

***On P375L39***

|  |  |  |  |  |
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| SPATIAL\_REUSE | FORMAT is EHT\_MU(#1260) |  Indicates the spatial reuse parameter value. There is one value of the parameter for an EHT MU PPDU. See the Spatial Reuse field definition 36.3.12.8.3 (Common field for OFDMA transmission), and 36.3.12.8.4 (Common field for non-OFDMA transmission).See 35.9 (Spatial reuse operation) and 35.10.zz (SPATIAL\_REUSE). | Y | Y |
| FORMAT is EHT\_TB(#1260) | Indicates the spatial reuse parameter value. There are one to two values of the parameter for an EHT TB PPDU, with the number of values present dependent on the bandwidth of the PPDU. See the Spatial Reuse field definition in 36.3.12.7.2 (Content).See 35.9 (Spatial reuse operation) and 35.10.zz (SPATIAL\_REUSE)..*.* | Y | Y |
| Otherwise | See corresponding entry in Table 27-1 (TXVECTOR and RXVECTOR parameters).(#1533)(#1260)(#3162) |

### CID 5495

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| **CID** | **Commentor** | **Clause** | **Page #** | **Comment** | **Proposed change** | **Resolution** |
| 5495 | Jian Yu | 36.3.22 | 549.6 | Correct reference for spatial reuse operation. In clude HE spatial reuse operation and EHT spatial reuse operation if exists. | as in comment | Revised: In 802.11be D1.1, the reference is now pointing to a newly added subclause 35.9 (Spatial reuse operation). TGbe editor: please incorporate change#2 shown in 11-21/1388r3. |

***Change #2:***

***TGbe Editor: Please remove “Editor’s Note” on P599L6, P599L22 and P599L54 in 802.11be D1.1***

~~Editor’s Note: The subclause 35.9 (Spatial reuse operation) is missing in the draft amendment.~~

—(#1355)The PHY entity shall not process the Disregard field.

—If the U-SIG field indicates a valid CRC and the U-SIG field indicates a Disregard U-SIG indication, the PHY entity shall continue processing the U-SIG. A Disregard U-SIG indication is defined as a Disregard field in the U-SIG being set to any value or a field value of a field in the U-SIG being set to a Disregard state.

—If the U-SIG field indicates an invalid CRC, the PHY shall issue the error conditionPHY-RXEND.indication(FormatViolation) primitive and maintain PHY-CCA.indication(BUSY, channellist) primitive for the predicted duration of the transmitted PPDU derived from the LENGTH field in L-SIG as defined in Equation (36-108) unless it receives a PHY-CCARESET.request primitive before the end of the PPDU for instance during spatial reuse operation as described in 35.9 (Spatial reuse operation)(#3197).

~~Editor’s Note: The subclause 35.9 (Spatial reuse operation) is missing in the draft amendment.~~

**If the received PPDU is EHT MU PPDU,** the PHY entity shall begin receiving the EHT-SIG, EHT-STF, and EHT-LTF for EHT MU PPDU as shown in Figure 36-83 (PHY receive procedure for an EHT MU PPDU). The PHY entity shall check the CRC of the Common field of EHT-SIG.

—If the CRC in the Common field of EHT-SIG is valid, for all supported modes, unsupported modes and Validate indication, the PHY entity shall maintain PHY-CCA.indication(BUSY, channellist) primitive for the predicted duration of the transmitted PPDU, as defined by RXTIME in Equation (36-108)(#2624), unless it receives a PHY-CCARESET.request primitive before the end of the PPDU for instance during spatial reuse operation as described in 35.9 (Spatial reuse operation). A Validate EHT-SIG indication is defined as a Validate subfield in the User field (associated with a non-MU-MIMO allocation) equals to 0, or the Coding subfield in the User field (associated with a MU-MIMO allocation for RU/MRU size greater than 242 tone) equals to 0.

***~~Editor’s Note: The subclause 35.9 (Spatial reuse operation) is missing in the draft amendment.~~***

—If the CRC in the Common field of EHT-SIG is valid, the PHY entity shall search for intendedSTA-ID in each User field. If an intended STA-ID is detected in a user block or in the common field (only if the PPDU type and compression mode and UL/DL indicate a DL non-OFDMA compressed mode) with valid CRC, and an unsupported mode or a Validate EHT-SIG indication is not indicated, the PHY entity shall continue receiving the EHT-STF right after the EHT-SIG.

### CID 6799

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| **CID** | **Commentor** | **Clause** | **Page #** | **Comment** | **Proposed change** | **Resolution** |
| 6799 | ron porat | 36.3.12.7.2  | 420.41421.51 | In the description of Spatial Reuse 1 and Spatial Reuse 2 fields in Table 36-31, the reference to sections 26.11.6 and 26.10 may be inaccurate and is better removed/replaced with clause 35 equivalent sections (or placeholders) for Spatial reuse operation, since there are some differences between HE and EHT spatial reuse operation:- PSR values follow 40MHz resolution in HE for bandwidth 160 MHz, whereas they are at 20 MHz resolution for all bandwidths in EHT.- Clause 26 (HE) does not cover 320 MHz bandwidth. | As in comment | ReviseTGbe editor: please incorporate change#3 and change#4 shown in 11-21/1388r3 |

***Change #3:***

***TGbe Editor: Please make changes in 802.11be D1.1 Table 36-31 (802.11be Draft 1.1)***

***On P470L7 and P471L7***

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| **Two parts of U-SIG** | **Bit** | **Field** | **Number of bits** | **Description** |
|  | B7–B10 | Spatial Reuse 1 | 4 | (#1618)Indicates whether or not specific spatial reuse modes are allowed in a subband of the PPDU during the transmission of this PPDU, and if PSR spatial reuse is allowed, indicates a value that is used to determine a limit on the transmit power of the PSRT PPDU.If the Bandwidth field indicates 20 MHz or 40 MHz, then this field applies to the first 20 MHz subband.If the Bandwidth field indicates 80 MHz, then this field applies to each 20 MHz subchannel of the first 40 MHz subband within the 80 MHz operating band.If the Bandwidth field indicates 160 MHz, then this field applies to each 20 MHz subchannel of the first 80 MHz subband within the 160 MHz operating band.If the Bandwidth field indicates 320 MHz-1 or 320 MHz-2, then this field applies to each 20 MHz subchannel of the first 160 MHz subband within the 320 MHz operating band.Set to the value of the SPATIAL\_REUSE(1) parameter of the TXVECTOR, which contains a value from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU). Note that Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) is also applied for an EHT TB PPDU (see 35.10.zz (SPATIAL\_REUSE) and 35.9 (Spatial reuse operation)). |
|  | B7–B10 | Spatial Reuse 2 | 4 | (#1618)Indicates whether or not specific spatial reuse modes are allowed in a subband of the PPDU during the transmission of this PPDU, and if PSR spatial reuse is allowed, indicates a value that is used to determine a limit on the transmit power of the PSRT PPDU.If the Bandwidth field indicates 20 MHz, this field is set to the same value as the Spatial Reuse 1 field, and Disregard if dot11EHTBaseLineFeaturesImplementedOnly equals true.If the Bandwidth field indicates 40 MHz, this field applies to the second 20 MHz subband. If operating in the 2.4 GHz band, this field is set to the same value as the Spatial Reuse 1 field.If the Bandwidth field indicates 80 MHz, then this field applies to each 20 MHz subchannel of the second 40 MHz subband within the 80 MHz operating band.If the Bandwidth field indicates 160 MHz, then this field applies to each 20 MHz subchannel of the second 80 MHz subband within the 160 MHz operating band.If the Bandwidth field indicates 320 MHz-1 or 320 MHz-2, then this field applies to each 20 MHz subchannel of the second 160 MHz subband within the 320 MHz operating band.(#2634)Set to the value of the SPATIAL\_REUSE(2) parameter of the TXVECTOR, which contains a value from Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU). Note that Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) is also applied for an EHT TB PPDU (see 35.10.zz (SPATIAL\_REUSE) and 35.9 (Spatial reuse operation)). |

***Change#4:***

***TGbe Editor: Please add new subclause 35.10.zz in 802.11be Draft 1.1***

**35.10.zz SPATIAL\_REUSE**

The contents of the Spatial Reuse fields are carried in the TXVECTOR parameter SPATIAL\_REUSE for an EHT PPDU indicating spatial reuse information. The behavior of STAs upon reception of an EHT PPDU with different SPATIAL\_REUSE values is described in 26.10.2 (OBSS PD-based spatial reuse operation) and 35.9.2 (PSR-based spatial reuse operation). The different values that may be indicated in the SPATIAL\_ REUSE parameter of the TXVECTOR are listed in Table 27-22 (Spatial Reuse field encoding for an HE SU PPDU, HE ER SU PPDU, and HE MU PPDU) which is applied to EHT MU PPDU and Table 27-23 (Spatial Reuse field encoding for an HE TB PPDU) which is applied to EHT TB PPDU. The value PSR\_DISALLOW is used to prohibit PSR-based spatial reuse during the transmission of the corresponding PPDU. The value PSR\_AND\_NON\_SRG\_ OBSS\_PD\_PROHIBITED is used to prohibit both PSR-based spatial reuse and non-SRG OBSS PD-based spatial reuse during the transmission of the corresponding PPDU. The interpretation of other values are described in this subclause and in 35.9 (Spatial reuse operation) and 26.10 (Spatial reuse operation). The conditions for a STA to set the SPATIAL\_REUSE parameter to its different values are described in this subclause.

For a PPDU with a value of EHT\_TB for the TXVECTOR parameter FORMAT, the SPATIAL\_REUSE parameter contains an array of one to two values, depending on the TXVECTOR parameter CH\_BANDWIDTH. If the TXVECTOR parameter CH\_BANDWIDTH is CBW20, the value is the SPATIAL\_REUSE parameter that applies to the 20 MHz subband. If the TXVECTOR parameter CH\_BANDWIDTH is CBW40, the first value in the array is the SPATIAL\_REUSE parameter that applies to the first lowest 20 MHz subband, the second value is the SPATIAL\_REUSE parameter that applies to the second lowest 20 MHz subband. If the TXVECTOR parameter CH\_BANDWIDTH is CBW80, the first value in the array is the SPATIAL\_REUSE parameter that applies to each 20MHz subchannel of the first lowest 40 MHz subband, the second value applies to each 20MHz subchannel of the second lowest 40 MHz subband. If the TXVECTOR parameter CH\_BANDWIDTH is CBW160, the first value in the array is the SPATIAL\_REUSE parameter that applies to each 20MHz subchannel of the first lowest 80 MHz subband, the second value applies to each 20MHz subchannel of the second lowest 80 MHz subband. If the TXVECTOR parameter CH\_BANDWIDTH is CBW320-1 or CBW320-2, the first value in the array is the SPATIAL\_REUSE parameter that applies to each 20MHz subchannel of the first lowest 160 MHz subband, the second value applies to each 20MHz subchannel of the second lowest 160 MHz subband.

An EHT STA that transmits an EHT TB PPDU sets the TXVECTOR parameter SPATIAL\_REUSE as defined in 35.4.2.3 (Non-AP STA behavior for UL MU operation).

A non-AP STA with dot11HEPSROptionImplemented set to true that transmits an EHT MU PPDU may set the TXVECTOR parameter SPATIAL\_REUSE, when permitted by other conditions, to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED if the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1. Otherwise, the non-AP STA shall set it to PSR\_DISALLOW.

An EHT STA that transmits an EHT TB PPDU determines the value of the TXVECTOR parameter SPATIAL\_REUSE according to 35.4.2.3 (Non-AP STA behavior for UL MU operation).

An EHT AP with dot11HEPSROptionImplemented set to true that transmits an EHT MU PPDU may set the TXVECTOR parameter SPATIAL\_REUSE to PSR\_DISALLOW to disallow OBSS STAs from performing PSR-based SR transmission during the duration of the corresponding PPDU.

An EHT STA with dot11HEPSROptionImplemented set to false may set the TXVECTOR parameter SPATIAL\_REUSE to PSR\_DISALLOW for any PPDU that is not an EHT TB PPDU, an EHT sounding NDP, a PPDU containing an EHT NDP Announcement frame, or a PPDU containing a response to an HE NDP Announcement frame.

A STA shall set the TXVECTOR parameter SPATIAL\_REUSE of an EHT PPDU to PSR\_DISALLOW or, if permitted by the other rules in this subclause, to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED, if the STA is a non-AP EHT STA and the PSR Disallowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1.

An EHT STA shall set the TXVECTOR parameter SPATIAL\_REUSE to PSR\_AND\_NON\_SRG\_OBSS\_PD\_ PROHIBITED for an EHT sounding NDP.

An EHT STA shall set the TXVECTOR parameter SPATIAL\_REUSE to PSR\_AND\_NON\_SRG\_OBSS\_PD\_ PROHIBITED for a PPDU containing an NDP Announcement frame and in any frame that is transmitted as a response to an NDP Announcement frame.

A non-AP EHT STA may set the TXVECTOR parameter SPATIAL\_REUSE of an EHT PPDU to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED if the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1. If the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 0, or if STA has not received a Spatial Reuse Parameter Set element from its associated AP, the STA shall not set the TXVECTOR parameter SPATIAL\_REUSE of any EHT PPDU to PSR\_AND\_NON\_SRG\_OBSS\_PD\_ PROHIBITED, unless the EHT PPDU contains an NDP, an NDP Announcement frame or is a frame that is transmitted as a response to an NDP Announcement frame.

An AP EHT STA may set the TXVECTOR parameter SPATIAL\_REUSE of an EHT PPDU to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED if the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently transmitted Spatial Reuse Parameter Set element is equal to 1. If the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently transmitted Spatial Reuse Parameter Set element is equal to 0, or if the AP has not transmitted a Spatial Reuse Parameter Set element, the AP shall not set the TXVECTOR parameter SPATIAL\_REUSE of any EHT PPDU to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED.

An EHT AP that transmits an EHT MU PPDU that contains a Trigger frame and is configured for a single user should set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAYED.

An EHT STA that transmits an EHT MU PPDU configured for more than one user shall not set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAYED.

An EHT STA that transmits an EHT MU PPDU configured for a single user shall not set the TXVECTOR parameter SPATIAL\_REUSE to SR\_RESTRICTED.

An EHT AP that transmits an EHT MU PPDU that contains a Trigger frame and is configured for more than one user should set the TXVECTOR parameter SPATIAL\_REUSE to SR\_RESTRICTED.

An EHT STA that transmits a PPDU that does not contain a Trigger frame shall not set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAYED or SR\_RESTRICTED.