IEEE P802.11
Wireless LANs

|  |
| --- |
| CC36 resolution for CIDs for 35.9 |
| Date: 2022-01-14 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Laurent Cariou |  |  |  | laurent.cariou@intel.com |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 4195 | 26.10.2.2 | 241.27 | Double NDP. Remove one. | As in comment. |  Revised – agree with the commenter. Apply the changes marked as #4195 in this document. |
| 5234 | 26.10.2.2 | 241.27 | Reduce doubled "NDP" | As in comment |  Revised – agree with the commenter. Apply the changes marked as #5234 in this document. |
| 5446 | 26.10.2.2 | 241.27 | NDP NDP Announcement | Remove one NDP |  Revised – agree with the commenter. Apply the changes marked as #5446 in this document. |
| 5776 | 26.10.2 | 443.13 | few modifications are needed for an EHT STA when operating with OBSS\_PD SR, to take into account puncturing and new EHT PPDU. | Define what is different for an EHT STA. |  Revised – agree with the commenter. Apply the changes marked as #5776 in this document. |
| 6174 | 26.10.2.2 | 241.21 | What's the meaning of the "..."? If this is TBD, it should be marked TBD | Replace "..." with a requirement at 241.19, 241.21. 241.42, and 241.44 |  Revised –Inlcude all baseline text to make it clearer. Apply the changes marked as #6174 in this document. |
| 7057 | 26.10.2.2 | 241.27 | Typo "NDP NDP" | Change to "NDP" |  Revised – agree with the commenter. Apply the changes marked as #7057 in this document. |
| 7394 | 26.10.2.2 | 241.26 | typo "an NDP(#1094) NDP Announcement frame" | Change the cited text to "an EHT(#1094) NDP Announcement frame" |  Revised – agree with the commenter. Apply the changes marked as #7394 in this document. |
| 8312 | 26.10.2.2 | 241.27 | There are two NDPs, please delete one. | as in comment. |  Revised – agree with the commenter. Apply the changes marked as #8312 in this document. |

1. **Introduction**
2. **Proposed spec text**

***TGbe editor: Within TGbe Draft D1.2, remove the changes to 26.10.2.2 (General operation with non-SRG OBSS PD level) and 26.10.2.3 (General operation with SRG OBSS PD level) (#6174)***

***TGbe editor: Within TGbe Draft D1.2, make the following changes to 26.10.2.2 (General operation with non-SRG OBSS PD level) and 26.10.2.3 (General operation with SRG OBSS PD level) as follows (#6174, #5776)***

* General operation with non-SRG OBSS PD level

If the PHY of a STA issues a PHY-CCA.indication(BUSY) followed by a PHY-RXSTART.indication due to a PPDU reception then the STA’s MAC sublayer may a) issue a PHY-CCARESET.request primitive before the end of the PPDU and not update its basic NAV timer based on the PPDU or may b) not update its basic NAV timer based on the PPDU if all the following conditions are met:

* The STA has not set the TXVECTOR parameter SPATIAL\_REUSE to the value PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED in any PPDU that has a TXVECTOR parameter SPATIAL\_REUSE present and that the STA has transmitted in the current beacon period and in the previous beacon period.
* The most recently received Spatial Reuse Parameter Set element from its associated AP had the Non-SRG OBSS PD SR Disallowed subfield equal to 0 or the non-AP STA has not received a Spatial Reuse Parameter Set element from its associated AP or the STA is an AP and its most recently transmitted Spatial Reuse Parameter Set element had the Non-SRG OBSS PD SR Disallowed subfield equal to 0 or the STA is an AP and has not transmitted a Spatial Reuse Parameter Set element.
* The received PPDU is an inter-BSS PPDU (see 26.2.2 (Intra-BSS and inter-BSS PPDU classification)) and the received PPDU is not a non-HT PPDU carrying a response frame (Ack, BlockAck or CTS frame), or the received PPDU contains a CTS and a PHY-CCA.indication transition from BUSY to IDLE occurred within the PIFS time immediately preceding the received CTS and that transition corresponded to the end of an inter-BSS PPDU that contained an RTS that was ignored following this procedure.
* The STA is operating with an SRG OBSS PD level as described in 26.10.2.3 (General operation with SRG OBSS PD level) and the received PPDU is not an SRG PPDU, or the STA is not operating with an SRG OBSS PD level.
* The RXVECTOR parameter SPATIAL\_REUSE (if present) of the received PPDU is not set to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED.
* The received signal strength level, which is measured from the L-STF or L-LTF fields of the PPDU or the PHY SYNC field, shortSYNC field or Long PHY SYNC field, whichever exists(#24235) and which is used to determine PHY-CCA.indication, is below the non-SRG OBSS PD level. The non-SRG OBSS PD level is defined in 26.10.2.4 (Adjustment of OBSS PD and transmit power). If the STA has dot11HEPSROptionImplemented set to true, it also follows the rules defined in 26.10.4 (Interaction of OBSS PD and PSR-based spatial reuse) to determine 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 an NDP Announcement frame or Fine Timing Measurement frame (#4195, #5234, #5446, #7057, #7394, #8312)
* A non-HE NDP

NOTE—A STA cannot perform SR over an sounding NDP or HE TB feedback NDP (see 26.11.6 (SPATIAL\_REUSE)).

If the frame is carried in an HE ER SU PPDU that is identified as an inter-BSS PPDU(#24419) (where power of the L-STF/L-LTF symbols is boosted 3 dB), the received signal strength, which is measured from the L-STF or L-LTF fields of the PPDU and which is used to determine PHY-CCA.indication, shall be decreased by 3 dB to compensate for the power difference.

NOTE—In the case of a received CF-End frame that satisfies the conditions above, either the issuance of a PHY-CCARESET.request or the choice to not update the basic NAV timer both result in the NAV not being canceled as would normally occur following the reception(#24377) of a CF-End frame.

The PHY-CCARESET.request primitive shall be issued at the end of the PPDU if the PPDU is an HE SU PPDU or an HE ER SU PPDU and the RXVECTOR parameter SPATIAL\_REUSE indicates SR\_DELAYED.

NOTE 1—A STA sets the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAYED in a PPDU if it allows OBSS PD-based spatial reuse operation, but only after the end of the PPDU.

NOTE 2—An AP can get protection equivalent to SR\_DELAYED by transmitting the Trigger frame in a non-HT PPDU or HT PPDU with the TXVECTOR parameter AGGREGATION set to 0 instead of in a VHT PPDU.

If the PHY-CCARESET.request primitive is issued before the end of the received PPDU, and a TXOP is initiated within the duration of the received PPDU, then the TXOP and the duration of the transmitted PPDU within that TXOP shall be limited to the duration of the received PPDU if the received PPDU is an HE MU PPDU and the RXVECTOR parameter SPATIAL\_REUSE indicates SR\_RESTRICTED.

NOTE—A STA sets the TXVECTOR parameter SPATIAL\_REUSE to SR\_RESTRICTED in a PPDU if it allows OBSS PD-based spatial reuse operation, but only before the end of the PPDU.

A STA that ignores a PPDU following the procedure described in this subclause is deemed to perform non-SRG OBSS PD-based spatial reuse.

* General operation with SRG OBSS PD level

If the PHY of a STA issues a PHY-CCA.indication(BUSY) followed by a PHY-RXSTART.indication due to a PPDU reception then the STA’s MAC sublayer may a) issue a PHY-CCARESET.request primitive before the end of the PPDU and not update its basic NAV timer based on the PPDU or may b) not update its basic NAV timer based on the PPDU if all the following conditions are met:

* The received PPDU is an SRG PPDU (see 26.2.3 (SRG PPDU identification))
* The received signal strength level, which is measured from the L-STF or L-LTF fields of the PPDU or the PHY SYNC field, shortSYNC field or Long PHY SYNC field, whichever exists(#24235) and which is used to determine PHY-CCA.indication, is below the SRG OBSS PD level. The SRG OBSS PD level is defined in 26.10.2.4 (Adjustment of OBSS PD and transmit power). If the STA has dot11HEPSROptionImplemented set to true, it also follows the rules defined in 26.10.4 (Interaction of OBSS PD and PSR-based spatial reuse) to determine 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 an NDP Announcement frame or Fine Timing Measurement frame (#4195, #5234, #5446, #7057, #7394, #8312)
* A non-HE NDP

NOTE—A STA cannot perform SR over an sounding NDP or HE TB feedback NDP (see 26.11.6 (SPATIAL\_REUSE)).

If the frame is carried in an HE ER SU PPDU that is identified as an inter-BSS PPDU(#24419) (where power of the L-STF/L-LTF symbols is boosted 3 dB), the received signal strength, which is measured from the L-STF or L-LTF fields of the PPDU and which is used to determine PHY-CCA.indication, shall be decreased by 3 dB to compensate for the power difference when compared to the OBSS PD level.

NOTE—In the case of a received CF-End frame that satisfies the conditions above, either the issuance of a PHY-CCARESET.request or the choice to not update the basic NAV timer both result in the NAV not being canceled as would normally occur following the reception(#24377) of a CF-End frame.

The PHY-CCARESET.request primitive shall be issued at the end of the PPDU if the PPDU is an HE SU PPDU or an HE ER SU PPDU and the RXVECTOR parameter SPATIAL\_REUSE indicates SR\_DELAYED.

NOTE—An AP can get protection equivalent to SR\_DELAYED by transmitting the Trigger frame in a non-HT PPDU or HT PPDU with the TXVECTOR parameter AGGREGATION set to 0 instead of in a VHT PPDU.

If the PHY-CCARESET.request primitive is issued before the end of the received PPDU, and a TXOP is initiated within the duration of the received PPDU, then the TXOP and the duration of the transmitted PPDU within that TXOP shall be limited to the duration of the received PPDU if the received PPDU is an HE MU PPDU and the RXVECTOR parameter SPATIAL\_REUSE indicates SR\_RESTRICTED.

NOTE—The restriction, in addition to the TXOP limit, of the PPDU duration within the TXOP is included in the above paragraph related to SR\_RESTRICTED as there are conditions where the TXOP limit can be exceeded (see 10.23.2.9 (TXOP limits)).

An AP that sends a Spatial Reuse Parameter Set element with the SRG Information Present subfield in the SR Control field set to 1 shall set the SRG BSS Color Bitmap and SRG Partial BSSID Bitmap fields as follows:

* If the transmitting AP is in the same ESS as another AP (i.e., with the same SSID and connected by a DS), or is controlled by the same external management entity as another AP (irrespective of SSID), then the transmitting AP may set the SRG BSS Color Bitmap and/or SRG Partial BSSID Bitmap fields that correspond to that other AP to 1
* Else, the AP shall set the bits in the SRG BSS Color Bitmap and/or SRG Partial BSSID Bitmap to 0.

If an HE AP determines values for dot11SRGAPBSSColorBitmap and dot11SRGAPBSSIDBitmap (i.e., the SRG for the AP’s own transmissions), then the values shall be determined according to the above rules.

***TGbe editor: Within TGbe Draft D1.2, make the following changes to 35.10 Spatial reuse operation (#5776)***

**35.10 Spatial reuse operation**

**35.10.1 General**

An EHT STA follows the rules defined in 26.10 (Spatial reuse operation) with different rules defined as below.

An EHT STA follows the rules defined in 26.2.3 (SRG PPDU identification) and the following rule:

* A received EHT PPDU that is an inter-BSS PPDU is an SRG PPDU if the bit in the SRG BSS Color Bitmap field indexed by the value of the RXVECTOR parameter BSS\_COLOR is 1 (see 9.4.2.252 (Spatial Reuse Parameter Set element)).

An EHT STA follows the rules defined in 35.2.3 (Intra-BSS and inter-BSS PPDU classification for EHT STA).

**35.10.2 OBSS PD-based spatial reuse operation**

An EHT STA follows the rules defined in 26.10.2.2 (General operation with non-SRG OBSS PD level) and 26.10.2.3 (General operation with SRG OBSS PD level) and the following rules:

* The PHY-CCARESET.request primitive shall be issued at the end of the PPDU if the PPDU is an EHT MU PPDU addressed to a single STA and the RXVECTOR parameter SPATIAL\_REUSE indicates SR\_DELAYED.
* If the PHY-CCARESET.request primitive is issued before the end of the received PPDU, and a TXOP is initiated within the duration of the received PPDU, then the TXOP and the duration of the transmitted PPDU within that TXOP shall be limited to the duration of the received PPDU if the received PPDU is an EHT MU PPDU addressed to multiple STAs and the RXVECTOR parameter SPATIAL\_REUSE indicates SR\_RESTRICTED.
* The received signal strength level used to determine if it is below the non-SRG OBSS PD level or SRG OBSS PD level is measured in dBm/20 MHz from the L-STF or L-LTF fields in at least one of the non-punctured 20 MHz subchannels of the PPDU or the PHY SYNC field, shortSYNC field or Long PHY SYNC field, whichever exists(#24235) and which is used to determine PHY-CCA.indication. It is implementation specific on which 20 MHz subchannels the received signal strength level is measured.

An EHT STA follows the rules defined in 26.10.2.4 (Adjustment of OBSS PD and transmit power), except that the following applies:

* If using OBSS PD-based spatial reuse, an EHT STA shall maintain an OBSS PD level and may adjust this OBSS PD level in conjunction with its transmit power. The adjustment shall be made in accordance with Equation (35-xxx).(#24235)

**(35-xxx)**

Where OBSSPDmin, OBSSPDmax, TXPWRref, TXPWR are defined in 26.10.2.4 (Adjustment of OBSS PD and transmit power).

**35.10.3 PSR-based spatial reuse operation**