IEEE P802.11
Wireless LANs

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| Proposed resolution to NoRSS related CIDs |
| Date: 2017-7-13 |
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|  |  |  |  |  |

Abstract

This submission proposes a resolution to several CIDs 197, 30 and 458 on the 11ay draft text.

The discussion is in reference to Draft IEEE P802.11ay/D0.3.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 197 | 10.38.2.1 | 58.27 | Frames and complete behaviour for NoRSS capability are not defined yet. | Define the frames and complete behaviour for NoRSS supported STAs. |

**Discussion:** the unsolicited RSS is proposed to replace NoRSS concept in 17/1085r0 (Unsolicited RSS for SLS in DTI). We need to define the frames and complete behaviour for NoRSS supported STAs

**Proposed resolution**: Revised

**9.5.3 Sector Sweep Feedback field**

***Change Figure 9-637 in 802.11-2016 as follows***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B8 | B9 B10 | B11 B15 | B16 | B17 B21 | B22 | B23 |
|  | Total Sectors in ISS | Number of RX DMG Antennas | Reserved | Poll Required | Reserved | Unsolicited RSS Enabled | Reserved |
| Bits: | 9 | 2 | 5 | 1 | 5 | 1 | 1 |

**Figure 9-637—SSW Feedback field format when transmitted as part of an ISS**

***Insert the following Figure 9-638a after Figure 9-637***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B5 | B6 B7 | B8 B15 | B16 | B17 B21 | B22 | B23 |
|  | Sector Select | DMG Antenna Select | SNR Report | Poll Required | Sector Select MSB |  Unsolicited RSS Enabled | EDMG Extension Flag |
| Bits: | 6 | 2 | 8 | 1 | 5 | 1 | 1 |

**Figure 9-638a—SSW Feedback field format when transmitted as part of an RSS**

***Change Figure 9-638 in 802.11ay D0.3 as follows***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B5 | B6 B7 | B8 B15 | B16 | B17 B21 | B22 | B23 |
|  | Sector Select | DMG Antenna Select | SNR Report | Poll Required | Sector Select MSB |  Reserved | EDMG Extension Flag |
| Bits: | 6 | 2 | 8 | 1 | 5 | 1 | 1 |

**Figure 9-638b—SSW Feedback field format when not transmitted as part of an ISS or RSS**

***Editor, add paragraph at end of the subclause***

The Unsolicited RSS Enabled subfield is set to 1 by an EDMG STA to indicate that it is capable of receiving an unsolicited RSS and completing the SLS with any other EDMG STA that opportunistically receives this ISS or RSS but that is not the STA addressed by this ISS or RSS (see 10.38.6.2). This subfield is set to 0 otherwise.

**9.4.2.250.2 Beamforming Capability field**

***Change Figure 22 in 9.4.2.250.2 as follows***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 B4 | B5 | B6 | B7 |  | B8 B15 |
|  | Requested BRP SC Blocks | MU-MIMO Supported | SU-MIMO Supported | Grant Required |  | Reserved |
| Bits: | 5 | 1 | 1 | 1 |  | 8 |

Figure 22—Beamforming Capability field format

***Remove the last paragraph in 9.4.2.250.2***

**9.5.5 Beamforming Control field**

***Change the Figure 9-640 and Figure Figure 9-641 in 802.11-2016 as follows:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 B9 | B10 B11 | B12 | B13 B15 |
|  | Beamforming Training | IsInitiatorTXSS | IsResponderTXSS | Total Number of Sectors | Number of RX DMG Antennas | Unsolicited RSS | Reserved |
| Bit: | 1 | 1 | 1 | 7 | 2 | 1 | 3 |

Figure 9-640 – BF Control field format when both IsInitiatorTXSS and IsResponderTXSS subfields are equal to 1 and the BF Control field is transmitted in Grant or Grant Ack frames

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 B8 | B9 | B10 B11 | B12 | B13 B15 |
|  | Beamforming Training | IsInitiatorTXSS | IsResponderTXSS | RXSS Length | RXSSTxRate | Reserved | Unsolicited RSS | Reserved |
| Bit: | 1 | 1 | 1 | 6 | 1 | 2 | 1 | 3 |

Figure 9-641 –BF Control field format in all other cases

***Change the third and the fourth paragraphs in 9.5.5 (IEEE 802.11-2016) as follows:***

The IsInitiatorTXSS subfield is set to 1 to indicate that the source DMG STA starts the beamforming training with an initiator TXSS. This subfield is set to 0 to indicate that the source DMG STA starts the BF training with an initiator RXSS. The IsInitiatorTXSS subfield is ignored if the Unsolicited RSS field is set to 1.

The IsResponderTXSS subfield is set to 1 to indicate that the destination DMG STA, or the source EDMG STA if the Unsolicited RSS subfield is set to 1, starts the RSS with a responder TXSS. This subfield is set to 0 to indicate that the destination DMG STA, or the source EDMG STA if the Unsolicited RSS subfield is set to 1, is to initiate the RSS with a responder RXSS.

***Insert the following paragraphs and Table 9-282a after the fourth paragraph in 9.5.5 (IEEE 802.11-2016):***

The Unsolicited RSS subfield is set to 1 to indicate the source EDMG STA intends to initiate an unsolicited RSS at the start of the TXOP or SP. This subfield is set to 0 to indicate the source EDMG STA intends to initiate an SLS with the ISS at the start of the allocation.

The interpretation of the IsInitiatorTXSS, IsResponderTXSS and Unsolicited RSS subfields are indicated in Table 9-282a.

**Table 9-282aIsInitiatorTXSS, IsResponderTXSS and Unsolicited RSS subfields**

|  |  |  |  |
| --- | --- | --- | --- |
| Bit 1 | Bit 2 | Bit 12 | Meaning |
| 1 | 0 | 0 | Initiator TXSS and Responder RXSS |
| 0 | 1 | 0 | Initiator RXSS and Responder TXSS |
| 1 | 1 | 0 | Initiator TXSS and Responder TXSS |
| 0 | 0 | 0 | Initiator RXSS and Responder RXSS |
| N/A | 1 | 1 | Responder TXSS only (no ISS) |
| N/A | 0 | 1 | Responder RXSS only (no ISS) |

**10.38.2 Sector-level sweep (SLS) phase**

**10.38.2.1 General**

***Remove the last paragraph***

**10.38.6.2 SLS phase execution**

***Editor, append following paragraphs and figure after last paragraph in 10.38.6.2***

An EDMG STA that is a TXOP holder or is a SP source may transmit SSW frame(s) with the Direction subfield set to 1 and RA equal to TA of the SSW frame the STA received with Unsolicited RSS Enabled field set to 1.

NOTE - If a TXOP holder or source STA of SP transmits SSW frames with the Direction field set to 1 at the beginning of a TXOP or SP, it is viewed as the responder for an ISS or RSS occurred in an earlier TXOP or SP. The EDMG STA performing the ISS or RSS in the earlier TXOP or SP is viewed as the initiator for the subsequent unsolicited RSS.

If an EDMG STA receives a SSW frame with the Unsolicited RSS Enabled subfield equal to 1, the STA may process the received SSW frames as a responder even if the STA’s MAC address does not match the RA field of the received SSW frame. The STA may then perform an RSS with the initiator in response to the received SSW frames in a subsequent TXOP or SP. This is known as an unsolicited RSS.

An unsolicited RSS takes place when all of the following conditions are met:

1. An EDMG STA transmits an SSW frame with the Unsolicited RSS Enabled subfield set to 1
2. Following the transmission of an SSW frame with the Unsolicited RSS Enabled subfield set to 1, the STA identified in (a) receives an SSW frame transmitted as part of an RSS for which the RA field of the SSW frame is equal to the STA’s MAC address
3. The STA that transmitted the SSW frame identified in (b) is different than the STA addressed by the SSW frame identified in (a).

An EDMG STA that receives an unsolicited RSS shall perform a SSW Feedback as specified in (10.38.2.4 Sector sweep (SSW) feedback).

An EDMG STA that transmitted unsolicited RSS shall wait for MBIFSTimeout interval, with value of MBIFS + aSlotTime + aRxPHYStartDelay starting at the PHY-TXEND.confirm primitive of the last SSW frame transmitted as part of the unsolicited RSS. If a PHY-RXSTART.indication primitive does not occur during the MBIFSTimeout interval, the STA concludes that the unsolicited RSS failed and may initiate an ISS to the STA the unsolicited RSS was transmitted to.

Figure xy shows an example of the unsolicited RSS. STA A that performs an ISS or RSS with STA C sets the Unsolicited RSS Enabled subfield to 1 to indicate it is operating as an initiator corresponding to a potential unsolicited RSS in a subsequent TXOP or SP. STA B (TXOP holder or source STA of SP) transmitting SSW frames with the Direction subfield set to 1 at the beginning of a TXOP or SP (e.g., TXOP2 or SP2) is viewed as the responder of STA A for the ISS or RSS in the earlier TXOP or SP (e.g., TXOP1 or SP1). In the TXOP2 or SP2, if a SSW frame with the Direction subfield set to 1 is received, STA A operates as the initiator and responds with a SSW Feedback frame without performing ISS.



Figure xy Example of unsolicited RSS

**10.38.2.2.2 Initiator TXSS**

***Insert the following paragraph after the third paragraph in 10.38.2.2.2***

If a TXOP is obtained through the transmission of a Grant frame and the TXOP holder intends to start the TXOP with an unsolicited RSS, the TXOP holder shall set the Unsolicited RSS subfield in the Grant frame to 1 to indicate the SLS begins with an unsolicited RSS and is performed without ISS.

If an SP is allocated with the Unsolicited RSS subfield in the BF Control field set to 1, the source STA shall set the Direction subfield in the SSW frame(s) to 1 to indicate the SLS begins with an unsolicited RSS and is performed without ISS.

|  |  |  |  |  |
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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 30 | 9.4.2.250.2 | 27.15 | The NoRSS field is set to one to indicate that the STA is able to receive an ISS in the DTI and not respond with an RSS as specified in 10.38.2": why define what the station is able "not to do"? Every 11ad station can receive a sector sweep and not do anything about it may be cournter productive though | Define the behavior more postiviely (possibly not in this clause) |

**Discussion:** The NoRSS field is removed. This comment (CID30) is resolved with the changes proposed in response to CID 197.

**Proposed resolution**: Revised

***Please refer to the resolution to CID197.***

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 458 |  | 28.15 | There is no normative meaning of NoRSSSupported field in the Beamforming Capability field | Remove the field |

**Discussion:** The NoRSS field is removed. This comment (CID458) is resolved with the changes proposed in response to CID 197.

**Proposed resolution**: Accepted

***Please refer to the resolution to CID197.***

**References:**

1. IEEE Std 802.11™-2016, Dec 2016
2. Draft P802.11ay\_D0.3