IEEE P802.11
Wireless LANs

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| SB1 Resolution to CID 4763 |
| Date: 2020-07-23 |
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Abstract

This document presents resolution to CID 4763

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| 4763 | 2034.00 | 10.42.2.3.3 | including any LBIFS if required', but on L23, it says each SSW is separated by SBIFS | remove ''including any LBIFS if required' | Revise (reject for the CID, other somewhat related issues found  |

Discussion:

The text in the current draft describing the RXSS:

“During the responder RXSS, the responder shall transmit the number of SSW frames indicated by the

initiator in the initiator’s most recently transmitted RXSS Length field (non-A-BFT) or FSS field (A-BFT) from the DMG antenna and sector that were selected during the preceding TXSS with the initiator. The responder shall set the Sector ID and DMG Antenna ID fields in each transmitted frame to a value that uniquely identifies the sector and DMG antenna, respectively, through which the BF frame is transmitted.

The responder shall set the CDOWN field in each transmitted SSW frame to contain the total number of

transmissions remaining until the end of the responder RXSS, such that the last SSW frame transmission of the responder RXSS has the CDOWN field equal to 0. Each transmitted SSW frame shall be separated by an interval of time equal to SBIFS, except if the allocation ends as described in 10.42.6 (Beamforming in DTI) or if the end of an SSW slot is reached as described in 10.42.5 (Beamforming in A-BFT). This is indicated in Figure 10-71 (Responder TXSS or responder RXSS).

The responder shall set the Sector Select field and the DMG Antenna Select field in each transmitted SSW frame to the value of the Sector ID field and the DMG Antenna ID field, respectively, of the frame received with the best quality during the ISS. The determination of which frame is received with best quality is implementation dependent and beyond the scope of this standard.

At the start of a responder RXSS, the initiator should have its receive antenna array configured to sweep

over RXSS Length sectors, including any LBIFS if required, when it attempts to receive frames from the

responder until the completion of the responder RXSS.”

The offending text in highlighted. The expected behvior is shown in the following figure (not from the spec).



This is an initiator RXSS (receiver sector sweep), so the responder transmits in a constant antenna pattern (DMG antenna and sector) while the initiator switches between receive sectors and antennas. In the example the initiator has 2 DMG antenna (arrays), the first one with 3 receive sectors and the second with 4 receive sectors. It sets the RXSS length to 8, allowing one LBIFS to switch between DMG antennas (arrays). LBIFS is equal to TXTIME(SSW) + 2×SBIFS so from the point of view of the transmitter it just needs to transmit RXSS length packet. From the point of view of the receiver, its worthwile to have some text indicating that the RXSS length includes “virtual rx patterns”. It is mentioned in the definition of the RXSS Length fields (in the DMG capabilies element, the SSW field and the BF control field. However, it is worth mentioning also in this place.

**Separte Issues found in CDMG and CMMG**

While searching the definition(s) of RXSS length two issues were found:

In the CDMG Extended Schedule element, in the BF control field, RXSS Length is 7 bit. For the definition of the field it points to 9.5.5 Beamforming Contorl Field where it is 6 bits only and the definition is “The value represented by this subfield is in the range 2 to 128 and is given by (RXSS Length+1)×2” which makes sense only for a 6 bit field. Since the CMMG beamforming procedure refers to DMG beamforming (10.42), the correct size is 6.

***Editor: in BF Control field format in all other cases (figure 9-739, P1437L4), change the length of the RXSSLength field to 1 (bit).***

***Editor: in Figure 9-739 (BF Control field format in all other cases)***

***and Figure 9-738 (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), change the subfield size indicateion from “octets” to “Bits”***

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 B9 | B10 B11 | B12 | B13 B15 |
|  | BeamformingTraining | IsInitiatorTXSS | IsResponderTXSS | Total Numberof Sectors | Number of RXDMG Antennas | NoPrimaryChannel | Reserved |
| Bits: | 1 | 1 | 1 | 7 | 2 | 1 | 3 |

***Figure 9-738—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(11aj)***



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 B8 | B9 B10 | B11 | B12 B15 |
|  | BeamformingTraining | IsInitiatorTXSS | IsResponderTXSS | RXSS Length  | RXSSTxRate | NoPrimaryChannel | Reserved |
| Bits: | 1 | 1 | 1 | 6 | 2 | 1 | 4 |

Figure 9-739—BF Control field format in all other cases(11aj)

For CMMG, in the CMMG Capabilities Info field format, the RXSS is assigned 1 bit (P1444L53), however the description is the same as above (P1446L43). This clearly doesn’t work. The size should be increased to 6 bits.

***Editor: in figure 9-754 (CMMG Capabilities Info field format) change the length of the RXSS Length field to 6, changing the bit numbering of further fields appropriately. Also change “Heart beat” field name to “Heartbeat”***

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B1 | B2 | B3 | B4 B5 | B6 | B7 | B8 | B9 |
|  | Maximum MPDU Length | Supported Channel Width Set | Tx STBC | Rx STBC | Short GI for 540 MHz | Short GI for 1080 MHz | Supported MIMO | Heartbeat |
| Bits: | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B10 B11 | B12 | B13 | B14 | B15 | B16 | B17 B22 |
|  | TPC | Number of Sounding Dimensions CMMG | ProtectedBlock Ack | CMMG Link Adaptation Capable | Rx Antenna Pattern Consistency | Tx Antenna Pattern Consistency | Fast Link Adaptation |
| Bits: | 2 | 1 | 1 | 1 | 1 | 1 | 6 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B23 B28 | B29 B30 | B31 | B32 B33 | B34 | B35 | B36 | B37 B43 |
|  | RXSS Length (#4196) | Color  | PSH and Interference Mitigation | Number of Rx Antennas | Supports Other\_AID | RXSS Tx Rate Supported | Antenna Pattern Reciprocity | Total Number of Sectors |
| Bits:  | 6 | 2 | 1 | 2 | 1 | 1 | 1 | 7 |

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| --- | --- | --- | --- | --- |
|  | B44 B46 | B47 B49 | B50 | B51 B55 |
|  | Heartbeat Elapsed Indication | MCSFeedback | RDResponder | Reserved |
| Bits:  | 3 | 3 | 1 | 5 |
|  |  |  |  |  |

* CMMG Capabilities Info field format(#4217)(#2289)(#2607)(11aj)