IEEE P802.11
Wireless LANs

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| LB174 Last\_RSSI Range-CID2289 |
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Abstract

This document proposes resoltions to CIDs 2289, 2301, 2294, 2302, 2290, 2295, 2303, 2296, 2291, 2297, 2304, 2292 on Last\_RSSI Range from LB174 on Draft 2.0 of TGad. For clarity, the proposed changes are based on the most recent Draft 2.0 of TGad.

All resolution are based on the text in D2.0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2289,2301,2294  | 178 | 17-19 | T | The range of Last\_RSSI is too high. Does not cover the sensitivity range for SC MCSs | The range of Last\_RSSI is too high. Does not cover the sensitivity range for SC MCSs |
| 2302,2290,2295  | 398 | 1 | T | The decoding value of Last\_RSSI does not match encoding values. | Change the decoding formula |
| 2303,2296,2291  | 418 | 1 | T | The decoding value of Last\_RSSI does not match encoding values. | Change the decoding formula |
| 2297,2304,2292  | 429 | 1 | T | The decoding value of Last\_RSSI does not match encoding values. | Change the decoding formula |

**Proposed Changes:**

*Modify P178L14-L20 in 9.2.3.1 as shown:*

When transmitting a response frame immediately following a SIFS period, a DBand STA shall set the TXVECTOR parameter Last\_RSSI of the response frame to the power that was measured on the received packet, as reported in the RCPI field of the frame that elicited the response frame. The encoding of the value is as follows: power values less than or equal ~~-65~~-68dBm are represented as the value of 1. Power values between ~~-65~~-68dBm and ~~-39~~-42dBm are represented as ~~round(power (-66dBm)/2)~~ round((power-(-71dBm))/2). Power values equal to or above ~~-39~~-42dBm are represented as the value 15. For all other cases, the Dband STA shall set the TXVECTOR parameter Last\_RSSI of the transmitted frame to zero.

Proposed Resolution: **Agree**.

**Discussion:**

The Last\_RSSI, was included in D2.0 as a means to

* Identifying link loss (or degradation)
* Performing BF Training
* SLS
* BRP
* Rate Selection

in order to achieve latency of less than 1 msec. The Last\_RSSI uses 4 bits and covers a range of -39 to -65 dBm.

The Last\_RSSI range does not cover the receiver sensitivity range for SC: -53 to -68 dBm and LP SC: -57 to -64 dBm as shown in Figure. The highest range of -39 dBm is 8 dB above sensitivity of the highest OFDM, suggesting the appropriate range should be lower.

Figure 1

As the range -65dBm to -68dBm range of the RSSI is the sensitivity level of SC MCS 1 to 3, which is the range where low power devices frequently operate. It is important that Last\_RSSI to cover lower SC MCS to support operation of low power devices which can operate predominantly in the lower SC MCSs.

The proposed Last\_RSSI range of -42dBm to -68 dBm would cover the SC MCSs and LP SC MCSs as shown in Figure 2.

Figure 2

Additionally, in the encoding formula in 9.2.3.1, P178L18 “round(power (-66dBm)/2)” a bracket is missing. This encoding formula should be corrected as “round((power-(-66dBm))/2)”

**Proposed Changes:**

*Modify Table 73 P398L1 in 21.2.2 as shown:*

|  |  |  |  |
| --- | --- | --- | --- |
| Last\_RSSI   | In the TXVECTOR, Last\_RSSI indicates the received power level of the last packet with a valid PHY header that was received a SIFS period before transmission of the current packet, otherwise it is zero (9.2.3.1 SIFS). In the RXVECTOR, Last\_RSSI indicates the value of the Last\_RSSI field from the PCLP header of the received packet. Valid values are integers in the range 0-15:  Values of 2-14 represent power levels (~~-68~~-71+value×2) dBm.  A value of 15 represents power greater than or equal to ~~-39~~-42dBm.  A value of 1 represents power less than or equal to ~~-65~~-68dBm. Value of 0 indicates that the previous packet was not received a SIFS period before the current transmission.  | Y | Y |

*Modify Table 84 in P418L1 in 21.5.3.1as shown:*

|  |  |  |  |
| --- | --- | --- | --- |
| Last\_RSSI   | 4  | 41 | In the TXVECTOR, Last\_RSSI indicates the received power level of the last packet with a valid PHY header that was received a SIFS period before transmission of the current packet, otherwise it is zero (9.2.3.1 SIFS). In the RXVECTOR, Last\_RSSI indicates the value of the Last\_RSSI field from the PCLP header of the received packet. Valid values are integers in the range 0-15:  Values of 2-14 represent power levels (~~-68~~-71+value×2) dBm.  A value of 15 represents power greater than or equal to ~~-39~~-42dBm.  A value of 1 represents power less than or equal to ~~-65~~-68dBm. Value of 0 indicates that the previous packet was not received a SIFS period before the current transmission. |

*Modify Table 88 in P429L1 in 21.6.3.1as shown:*

|  |  |  |  |
| --- | --- | --- | --- |
| Last\_RSSI   | 4  | 41 | In the TXVECTOR, Last\_RSSI indicates the received power level of the last packet with a valid PHY header that was received a SIFS period before transmission of the current packet, otherwise it is zero (9.2.3.1 SIFS). In the RXVECTOR, Last\_RSSI indicates the value of the Last\_RSSI field from the PCLP header of the received packet. Valid values are integers in the range 0-15:  Values of 2-14 represent power levels (~~-68~~-71+value×2) dBm.  A value of 15 represents power greater than or equal to ~~-39~~-42dBm.  A value of 1 represents power less than or equal to ~~-65~~-68dBm. Value of 0 indicates that the previous packet was not received a SIFS period before the current transmission. |

Proposed Resolution: **Agree**

**Discussion:**

The decoding formulas in Tables 73, 84, 88 do not produce values which match the encoding formula as illustrate in the following table.

|  |  |  |
| --- | --- | --- |
| **RSSI**  | **After Encoding**  | **After Decoding**  |
| **dBm**  | **Round((power-66dBm)/2)**  | **(-68+value\*2)**  |
| -65 | 1  | -66  |
| -64  | 1  | -66  |
| -63  | 2  | -64  |
| -62  | 2  | -64  |
| -38  | 14  | -40  |
| -37  | 15  | -38  |

Table 1

It is proposed to modify the formulas to match the encoding rule and new Last\_RSSI range.