IEEE P802.11  
Wireless LANs

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| Resolution to CID 6184-9 | | |
| Date: 2020-April-21 | | |
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Abstract

This submission proposes resolution to CID 6184, 6185, 6186, 6187, 6188 & 6189.

The resolutions are in reference to Draft IEEE P802.11ay Draft5.0

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| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 6184 | 9.4.2.142.3 | Inconsistency:  In section 9.4.2.142.3 the text is "If the value of this subfield is greater than 0, the MCS, Link Margin and SNR fields in the DMG Link Margin element are reserved.".  However in section 9.4.2.142.1 suggested changes are: "The SNR field is reserved when the value of the Number of Space-Time Streams Reported (NSTS) subfield within the Rate Adaptation Control/Extended TPC field is greater than 1." | I suggest to remove the issue by deleting in section 9.4.2.142.3 the text is "If the value of this subfield is greater than 0, the MCS, Link Margin and SNR fields in the DMG Link Margin element are reserved.". |

**Existing text:**

**9.4.2.142.1 General**

*Change Figure 9-583 (DMG Link Margin element format) as follows*

The MCS field is set to an integer representation of the MCS that the STA sending this element recommends that the peer STA indicated in the RA field of the Link Measurement Report frame use to transmit frames to this STA. The reference PER for selection of the MCS is 10-2 for an MPDU length of 4096 octets. The method by which the sending STA determines a suitable MCS for the peer STA is implementation specific. Values 0-12 and values 25-31 indicate MCS 0 to MCS 12 and MCS 25 to MCS 31, respectively. Values 133, 134, 135, 136, 137, 138, 140 indicate MCSs 12.1, 9.1, 12.3, 12.4, 12.5, 12.2 and 12.6, respectively. The MCS field is reserved when the value of the Number of Space-Time Streams Reported (NSTS) subfield within the Rate Adaptation Control/Extended TPC field is greater than 1.

The Link Margin field contains the measured link margin of Data frames received from the peer STA indicated in the RA field of the Link Measurement Report frame and is coded as a 2s complement signed integer in units of decibels. A value of –128 indicates that no link margin is provided. The method used to measure the link margin is beyond the scope of this standard. The Link Margin field is reserved when the value of the Number of Space-Time Streams Reported (NSTS) subfield within the Rate Adaptation Control/Extended TPC field is greater than 1.

The SNR field indicates the SNR measured during the reception of a PPDU(#1379). Values are from –13 dB to 50.75 dB in 0.25 dB steps. The SNR field is reserved when the value of the Number of Space-Time Streams Reported (NSTS) subfield within the Rate Adaptation Control/Extended TPC field is greater than 1.

**9.4.2.142.3 Rate Adaptation Control/Extended TPC field**

The Number of RX Chains Reported (NRX) subfield indicates the number of RX chain entries being reported. Each entry, *i*, corresponds to an RX chain *i*. If the value of this subfield is greater than 0, the MCS, Link Margin and SNR fields in the DMG Link Margin element are reserved.

**Discussion:**

The text in **9.4.2.142.1** looks sufficient and in the right place.

The text in **9.4.2.142.3** looks redundant and may cause confusion. In addition, it is not in the right place.

**Proposed resolution:** **Accept.**

***TGay Editor: Remove the following text from 9.4.2.142.3 P129L19-20:***

~~If the value of this subfield is greater than 0, the MCS, Link Margin and SNR fields in the DMG Link Margin element are reserved.~~

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| CID | Clause | Comment | Proposed change |
| 6185 | 9.4.2.142.3 | The text doesn't provide rules for the case when Number of PPDUs is 0, as in other cases (e.g. MCS field). | Suggest to copy from MCS case. Add "If the Number of PPDUs subfield within the Rate Adaptation Control/Extended TPC field is 0, the SNRi subfield is set to 255" (add this before the last sentence in the paragraph - line 35) |

**Discussion:**

**9.4.2.142.5 PPDU Statistics field**

Each SNRi subfield, 1 ≤ *i* ≤ *NSTS*, where *NSTS* is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, contains the SNR of space-time stream *i* averaged across all PSDUs received within a report interval intended for the STA, and where the PSDUs are transmitted using an MCS other than MCS 0 or EDMG MCS 0. The value of the subfield is found by computing the arithmetic mean of the PPDU signal-to-noise ratios with signal and noise power in mW, converting the result to dB, and encoding the dB value in the same way as the SNR field in the Channel Measurement Feedback element. This statistic is reset when the reset condition defined in 9.4.2.142.6 is met.

The above text doesn’t provide rules for the case when Number of PPDUs is 0. The next paragraph, regarding MCS, does.

In addition, When Number of PPDUs is 0, it should be considered to avoid sending the Rx Chain Statistics, PPDU statistics, LDPC statistics and SC/OFDM statistics with empty values.

The text on page 352 lines 8-9 looks incomplete.

**Proposed resolution:** **Revised.**

***TGay Editor: Edit the text in 9.4.2.142.5 starting at P130L29:***

Each SNRi subfield, 1 ≤ *i* ≤ *NSTS*, where *NSTS* is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, contains the SNR of space-time stream *i* averaged across all PSDUs received within a report interval intended for the STA, and where the PSDUs are transmitted using an MCS other than MCS 0 or EDMG MCS 0. The value of the subfield is found by computing the arithmetic mean of the PPDU signal-to-noise ratios with signal and noise power in mW, converting the result to dB, and encoding the dB value in the same way as the SNR field in the Channel Measurement Feedback element. If the Number of PPDUs subfield within the Rate Adaptation Control/Extended TPC field is 0 and the PPDU Statistics field is present, the SNRi subfield is set to 0xFF This statistic is reset when the reset condition defined in 9.4.2.142.6 is met.

Each MCSi subfield, 1 ≤ i ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, contains the MCS of space-time stream i. This subfield is used to indicate the MCS that was used to collect the values within the LDPC Statistics field or SC/OFDM Statistics field. If the Number of PPDUs subfield within the Rate Adaptation Control/Extended TPC field is 0 and the PPDU Statistics field is present, the MCSi subfield is set to 255. This statistic is reset when the reset condition defined in 9.4.2.142.6 is met.

Each Link Margini subfield, 1 ≤ i ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, contains the link margin measured on space-time stream i and averaged across all PPDUs received within a report interval intended for the STA, and where all the PPDUs are transmitted using an MCS other than MCS 0 or EDMG MCS 0. The value of the subfield is found by computing the arithmetic mean of link margin values in decibels, and encoding the result as a 2s complement signed integer in units of decibels. A value of –128 indicates that no link margin is provided. The method used to measure link margin is beyond the scope of this standard. If the Number of PPDUs subfield within the Rate Adaptation Control/Extended TPC field is 0 and the PPDU Statistics field is present, the Link Margini subfield is set to –128.This statistic is reset when the reset condition defined in 9.4.2.142.6 is met.

***TGay Editor: Edit the text in 10.43.1 P352L30-45:***

If the Dialog Token field in the Link Measurement Report frame is equal to the nonzero Dialog Token field of the Link Measurement Request frame, then the MCS, SNR, and Link Margin fields of the Link Measurement Report frame shall be computed using the measurements of the PPDU that is the next PPDU received from the requesting STA, or the PPDUs received from the requesting STA within the corresponding report interval and subject to the reset condition rules (see 9.4.2.142.6). The DMG Link Margin element within the Link Measurement

***TGay Editor: Add the following before the Note in 10.43.1 P352L45:***

The DMG Link Margin element should not include Rx Chain Statistics, PPDU Statistics, LDPC Statistics and SC/OFDM Statistics fields when it is transmitted with the Number of PPDUs subfield in the Rate Adaptation Control/Extended TPC field is 0.

***TGay Editor: Edit the text in 9.4.2.142.3 P130L8-9:***

The Number of PPDUs subfield contains the number of PPDUs over which the reported statistics were measured.

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| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 6186 | 9.4.2.142.6 | The text states that the Max Iterationi subfield presents the maximum of iterations over codewords and PSDUs, where one iteration is processing all rows. However the fiels has a resolution of 0.1. This can be confusion since it is not clear how one can get a non integer number. | Suggest to add a comment sentence that non integer numbers can reflect stop before all rows are processed. |

**Discussion:**

**9.4.2.142.6 LDPC Statistics field**

Each Max Iterationi subfield, 1 ≤ *i* ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, indicates the maximum number of iterations used by the LDPC decoder on PSDUs of space-time stream *i* received with an MCS different than MCS 0 or EDMG MCS 0. One iteration includes processing of all rows. The value of the subfield is the maximum number of iterations across all LDPC codewords in each PSDU, and across all PSDUs in the measurement set, encoded as an 8 bit unsigned integer with 0 to 255 representing 0.0 to +25.5 iterations in 0.1 steps. This statistic is reset when the reset condition defined below in this subclause is met.

**Proposed resolution:** **Revised.**

***TGay Editor: Add the following text in 9.4.2.142.6 after P131L35:***

Note – The fractional part of the Max Iteration subfield represents the ratio of processed rows to total number of rows.

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 6187 | 9.4.2.142.8 | The text in lines 4-12 is not clear (there is too much freedom) and no Activity codes are reserved for other purpouses (and no real reson for it). It should be noted that there is an Activity field in REVmd Table 9-266 | Suggest to remove options and specify only what is currently defined. All other values to be reserved:  Change to:  If the Activityi subfield is 1, ...., where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, the Link Margini subfield contains the new requested MCS for space-time stream i. If the Activityi subfield is 2 (delete: or 3), the Link Margini subfield contains the amount of transmit power change, in units of dB, for space-time stream i in 2s complement format and in steps of 0.25 dB. If the Activityi subfield is 3, the Link Margini field contains the measured link margin of the space-time stream i received from the peer STA indicated in the RA field of the Link Measurement Report frame and is coded as a 2s complement signed integer in units of decibels. A value of -128 indicates that no link margin is provided. All other values are reserved. The method used to measure the link margin is beyond the scope of this standard.  l also suggest to add that if field is zero do nothing.  I suggest to rewrite this paragraph as a table. |
| 6188 | 9.4.2.142.8 | The text says: "The Activity field is defined in 9.4.2.142.2."  This is not so good. First the Activity field values in 9.4.2.142.2 are very basic and not efficient (e.g. Increase power is just a bit, but without any value associated).  Second we have a better definition in the next paragraph (page 133 lines 4-12). Better to use this one. | Suggested to remove the sentence "The Activity field is defined in 9.4.2.142.2.".  There is no need for it and causes confusion with next paragraph. |

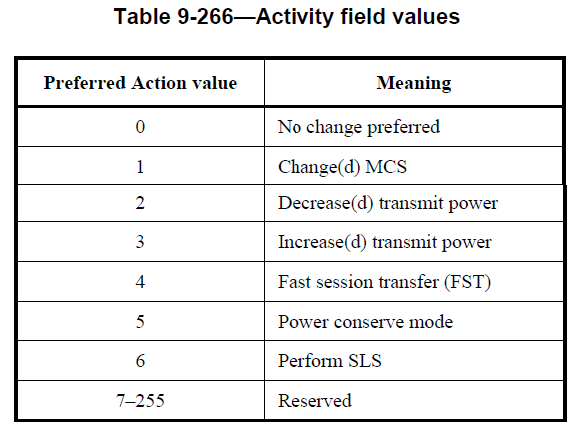
**Discussion:**

**11ay: 9.4.2.142.8 Extended TPC**

The Activityi subfield, 1 ≤ *i* ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, is set to a preferred action that the STA sending this element recommends that the peer STA indicated in the RA field of the Link Measurement Report frame execute for space-time stream *i*. The method by which the sending STA determines a suitable action for the peer STA is implementation specific. The Activity field is defined in 9.4.2.142.2.

If the Activityi subfield is 1, 1 ≤ *i* ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, the Link Margini subfield contains the new requested MCS for space-time stream *i*. If the Activityi subfield is 2 or 3, the Link Margini subfield contains the amount of transmit power change, in units of dB, for space-time stream *i* in 2s complement format and in steps of 0.25 dB. For other values of the Activityi subfield, the Link Margini field contains the measured link margin of the space-time stream *i* received from the peer STA indicated in the RA field of the Link Measurement Report frame and is coded as a 2s complement signed integer in units of decibels. A value of –128 indicates that no link margin is provided. The method used to measure the link margin is beyond the scope of this standard.

**REVmd: 9.4.2.142.2 Activity field**



**Proposed resolution:** **Revised.**

1. Rename the **Activityi** dubfield as **Extended Activityi** to avoid confusion
2. Present the **Extended Activityi** in a table as in REVmd
3. Only one code for Link Margin
4. Rename the Link Margin field as **Extended ActivityParameter**
5. Reorganize the codes
6. Update the accordingly
7. Simplify the text in 9.4.2.142.1

***TGay Editor: Edit section in 9.4.2.142.1 Extended TPC P129L1-10:***

The RX Chain Statistics field is optionally present. It is defined in 9.4.2.142.4.

The PPDU Statistics field is optionally present. It is defined in 9.4.2.142.5.

The LDPC Statistics field is optionally present. It is defined in 9.4.2.142.6.

The SC/OFDM Statistics field is optionally present. It is defined in 9.4.2.142.7.

The Extended TPC field is optionally present. It is defined in 9.4.2.142.8.

***TGay Editor: Replace section 9.4.2.142.8 Extended TPC P132L30:***

The Extended TPC field is defined in Figure 9-583f.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Extended Activity1 | Extended Activity Parameter1 | … | Extended ActivityNSTS | Extended Activity ParameterNSTS |
| Octets: | 1 | 1 |  | 1 | 1 |

The Extended Activityi subfield, 1 ≤ *i* ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams Reported subfield within the Rate Adaptation Control/Extended TPC field, indicates

* An action that the STA sending this element (sending STA) recommends that the peer STA indicated in the RA field of the Link Measurement Report frame (peer STA) perform for space-time stream *i*, or,
* Information about space-time stream *i* that is helpful to the peer STA when performing TPC.

The method by which the sending STA determines a suitable action for the peer STA is implementation specific.

Each Extended Activity subfield is followed by an Extended Activity Parameter subfield. The Extended Activity and Extended Activity Parameter subfields are defined in Table 9-New.

**Table 9-New — Extended Activity field values**

|  |  |  |
| --- | --- | --- |
| **Extended Activity field values** | **Description** | **Extended Activity Parameter** |
| 0 | No action | Reserved |
| 1 | Change MCS | Requested MCS for space-time stream i. |
| 2 | Increase /decrease transmit power | Change in transmit power for space-time stream i, in units of 0.25 dB, and encoded as an 8-bit 2s complement signed integer. The encoding covers the range from -32 dB to 31.75 dB in 0.25 dB steps. |
| 3 | Link Margin | Link margin for space-time stream i, in units of dB (2s complement signed integer). The method used to measure link margin is beyond the scope of this standard. |
| 4-255 | Reserved | Reserved |

The sending STA should report link margin values through the PPDU Statistics field (9.4.2.142.5 PPDU Statistics field) when the field is present, and through the Extended TPC field otherwise.

NOTE—The link margin values in the PPDU Statistics field are calculated across PPDUs in a report interval and combined as described in 9.4.2.142.5. The link margin values in the Extended TPC field are implementation specific.

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 6189 | 9.4.2.143 | Better to use the text in 9.4.2.142.8. Better options, more coherent and in sync with 9.4.2.142 | Replace "Activity field is defined in 9.4.2.142.2." with "Activity field is defined in 9.4.2.142.8." |

**Discussion:**

The Activity field is redefined in 9.4.2.142.8 and it is different than defined in 9.4.2.142.2.

Furthermore, in the resolution of CIDs 6187-8 the Activity field in 9.4.2.142.8 is renamed as Extended Activity field.

The text in P353L27-36 is partial.

The names also need to be updated.

**Proposed resolution:** **Revised.**

***TGay Editor: Replace section 9.4.2.143 P133L20-30:***

The Number of STS Reported (NSTS) subfield is optionally present. If present, it indicates the number of STS being

reported in the Extended TPC Link Adaptation Acknowledgement subfield. If the value of this field is greater than 0, the Extended Activity Acknowledgementfield in the DMG Link Adaptation Acknowledgment element is reserved.

The Extended TPC Link Adaptation Acknowledgement field is present if the value of the Number of STS Reported (NSTS) subfield is greater than 0, and its format is shown in Figure 9-584b.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Extended Activity Acknowledgement 1 | Extended Activity Acknowledgement Parameter1 | … | Extended Activity Acknowledgement NSTS | Extended Activity Acknowledgement Parameter NSTS |
| Octets: | 1 | 1 |  | 1 | 1 |

**Figure 9-584b – Extended TPC Link Adaptation Acknowledgement field format**

Each Extended Activity Acknowledgementi subfield, 1 ≤ *i* ≤ *NSTS*, within the Extended TPC Link Adaptation Acknowledgement field is set to the action that the STA sending this element has taken for the STS *i* following the reception of the Extended Activity in a Link Measurement Report frame. The method by which the sending STA determines the action is described in 10.43 .

The Extended Activity AcknowledgementParameteri subfield contains the parameter associated with the Extended Activity Acknowledgementi for space-time stream *i*.

If the Extended Activity Acknowledgementi subfield is 1, 1 ≤ *i* ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams acknowledged within the Extended TPC Link Adaptation Acknowledgement subfield, the Extended Activity Acknowledgement Parameteri subfield contains the transmit power change that was done for space-time stream i, in units of 0.25 dB, and encoded as an 8-bit 2s complement signed integer. The encoding covers the range from -32 dB to 31.75 dB in 0.25 dB steps.

If the Extended Activity Acknowledgementi subfield is 0, 1 ≤ *i* ≤ NSTS, where NSTS is the value of the Number of Space-Time Streams acknowledged within the Extended TPC Link Adaptation Acknowledgement subfield, no change is indicated.

All other values for Extended Activity Acknowledgementi subfield are reserved.

***TGay Editor: Edit the following paragraph P353L27-36:***

* If the STA implements the recommendation indicated in the Extended Activity field of a Link Measurement Report frame that includes a Rate Adaptation Control/Extended TPC field for one or more STS, it shall send a Link Measurement Report frame containing a DMG Link Adaptation Acknowledgment element. The value of the Number of STS Reported field within the DMG Link Adaptation Acknowledgment element shall be set to the same value of the Number of STS Reported field in the DMG Link Margin element within the Link Measurement Report frame. If the STA implements the recommendation for an STS, the Extended Activity Acknowledgement field of the DMG Link Adaptation Acknowledgment element shall be set to the value of the Extended Activity field in the received DMG Link Margin element of the same STS. If the STA does not implement the recommendation for an STS, the Activity field of the DMG Link Adaptation Acknowledgment element shall be set to 0. In addition, the Extended Activity Acknowledgement Parameter value shall be set to the actual transmit power change that the STA implements, using the same encoding as the transmit power change request, see 9.4.2.142.8.

***TGay Editor: Insert the following paragraph after the first paragraph 10.43.1 P352 after L4:***

The Number of Space-Time Streams Reported (NSTS) field in the DMG Link Margin element shall be set to the same value as the number of Space-Time Streams received.