IEEE P802.11
Wireless LANs

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| 802.11[Resolutions to CID #1015, 1145, 1364, 1384 and 1506(relative to IEEE 802.11 REVmd D1.0) |
| Date: 2018-07-10 |
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**Abstract**

This submission proposes resolutions to CIDs 1015, 1145, 1384 and 1506.

History:

R0: Initial Version

R1: added CID #1145

R2: updated with feedback from the Thu PM1 REVmd session at the Warsaw May 2018 meeting. Note that CID #1145 needs some additional work with the commenter.

R3: Added CID 1364. Updated resolution to 1506 based on Carlos Aldana’s feedback

R4: updatred with discussion/feedback from the June 01, 2018 teleconference.

R5: Updates to include suggestions from Mark Rison

R6: With changes made during the June 15th teleconference. CID #1506 needs some work. It is not clear if FTM frames can be retransmitted without violating the Min Delta FTM condition; and can IFTM frames be retransmitted? Need a resolution for these before the July Meeting.

R7: added some suggestions from Jonathan Segev

R8: Updated the ‘Revise Resolution’ to CID 1506.

R9: Cleaned up the ‘Revise Resolution’ from R7 that was retained to facilitate discussion in REVmd.

R10: Updated the resolution to CID 1506 to include “The timing of the burst instances is defined by the following parameters:” from the baseline.

R11: Updated notes related to CID #1364.

R12: Updated resolution for CID #1364 based on discussions in the REVmd session in San Diego (THU PM1)

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| 1015 | Yongho Seok | 11.22.6.3 | 2161 | 51 | 7th paragraph of 11.22.6.3 (Fine timing measurement procedure negotiation) is exactly same with the first bullet of 8th paragraph."The initiating STA shall indicate, in the Format and Bandwidth field, a format and bandwidth that itsupports..."Remove 7th paragraph of 11.22.6.3 (Fine timing measurement procedure negotiation). | Remove 7th paragraph of 11.22.6.3 (Fine timing measurement procedure negotiation). | FTM | REVISE |

**Discussion:**

11.22.6.3 8th paragraph describes what happens when the FTM negotiation is successful and should only specify what is included in the initial FTM frame (the response to the initial FTM Request from the initiator) contains. It should not specify what was included in the initial FTM Request.

**Resolution: Revise. Apply changes described below.**

**REVISE:**

***Change paragraph 7 of Cl. 11.22.6.3 as shown below:***

The initiating STA shall indicate, in the Format and Bandwidth field, a format and bandwidth that it
supports.

***Modify the first bullet in P2161L63-64 Cl. 11.22.6.3 as shown below:***

If the request was successful

—The responding STA shall indicate, in the Format and Bandwidth field, a format and bandwidth that it supports. The responding STA should indicate the same format and bandwidth in the Format and Bandwidth field as that requested by the initiating STA, if the responding STA supports this. The responding STA shall not indicate a bandwidth wider than requested. The responding STA shall not indicate a VHT format if DMG, HT-mixed or non-HT format was requested. The responding STA shall not indicate an HT format if DMG or non-HT format was requested. The responding STA shall not indicate a DMG format if VHT, HT-mixed or non-HT format was requested.

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| 1384 | Mark RISON | 11.22.16.3 | 2184 | 51 | It is not clear what the difference is between 11.22.16.3 GCR procedures (under 11.22 WNM) and 10.25.8 GCR block ack | In 11.22.16.3 add a para "See 10.25.8 for the mechanisms by which GCR block ack operates." | GCR | Reject |

**Discussion:** 11.22.16.3.7 discusses GCR Block Ack and has a reference to 10.25.8. (P2185L50)

**Resolution:** REJECT

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| 1506 | Mark RISON | 11.22.6.4 | 2163 | 23 | It is not clear whether burst instances are the only time periods during which FTM frames may be sent | After the first sentence of the referenced subclause add "Fine Timing Measurement frames shall not be sent outside burst instances." | FTM | REVISE |

**Discussion:** The Initial Fine Timing Measurement frame is a case where the FTM frame is transmitted outside the burst instance. Amend the proposed resolution to “Fine Timing Measurement frames other than the Initial Fine Timing Measurement frame shall not be sent outside burst instances.”

Feedback from Carlos Aldana: "When the responder sets ASAP to 0, Fine Timing Measurements frames (and their retransmissions) other than the IFTM shall not be sent outside burst instances. When the responder sets ASAP to 1, Fine Timing Measurements frames (and their retransmissions) shall not be sent outside burst instances "

Feedback from Jonathan Segev:

The time windows during which TOD measurement for the transmission of the Fine Timing Measurement and the TOA measurement on the receipt of the acknowledgement corresponding to the transmitted Fine Timing Measurement frame are performed~~Fine Timing Measurement frames are sent~~ are known as burst instances. Fine Timing Measurement frames over which TOD and TOA measurements are performed shall not be sent outside burst instances.

**Resolution:**

**REVISE:**

***Change the first paragraph of Cl. 11.22.6.4 as shown below. Insert after the 1st sentence in Para 1 as shown :***

**11.22.6.4 Measurement exchange**

The time windows during which TOD measurement for the transmission of the Fine Timing Measurement frame and the TOA measurement on the receipt of the acknowledgement corresponding to the transmitted Fine Timing Measurement frame are performed are known as burst instances. Fine Timing Measurement frames over which TOD and TOA measurements are performed shall not be sent outside burst instances. The timing of the burst instances is defined by the following parameters:

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| 1145 | Yongho Seok | 9.4.2.166 | 1265 | 38 | An S1G STA can use the Fine Timing Measurement procedure.Add S1G PPDU format into Table 9-272 (Format And Bandwidth field). | Add S1G PPDU format into Table 9-272 (Format And Bandwidth field). | FTM | Revise |

**Discussion:** Some additional changes (beyond the proposed) are required in order to enable Fine Timing Measurement over S1G

During the discussion in REVmd – suggest that the commenter bring in a submission to demonstrate a market need for FTM over S1G. Also need technical feasibility on FTM over 1MHz bandwidth.

The accuracy requirement over S1G links for the Use Cases is different from what it is for over 2.4/5/60 GHz bands

**Resolution:**

**REVISE:**

***Update Table 9-272 – Format and Bandwidth field as shown below:***

|  |  |  |
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| **Field Value** | **Format** | **Bandwidth (MHz)** |
| 17 | S1G | 1 |
| 18 | S1G | 2 |
| 19 | S1G | 4 |
| 20 | S1G | 8 |
| 21 | S1G | 16 |
| 22-30 | Reserved | Reserved |

***Modify the first bullet of paragraph 8 of Clause 11.22.6.3 as shown below:***

The responding STA shall indicate, in the Format and Bandwidth field, a format and bandwidth that it supports. The responding STA should indicate the same format and bandwidth in the Format and Bandwidth field as that requested by the initiating STA, if the responding STA supports this. The responding STA shall not indicate a bandwidth wider than requested. The responding STA shall not indicate an HT
format if S1G, DMG or non-HT format was requested. The responding STA shall not indicate a VHT format if S1G, DMG, HT-mixed or non-HT format was requested. The responding STA shall not indicate a DMG format if S1G, VHT, HT-mixed or non-HT format was requested. The responding STA shall not indicate an S1G format if DMG, VHT, HT-mixed or non-HT format was requested.

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| 1364 | Mark RISON | 11.22.6.4 | 2163 | 21 | The RTT includes the turnaround time.  Using it for a context (FTM) that excludes this leads to confusion with techniques that estimate range by measuring the actual RTT and then subtracting the estimated turnaround time at the peer | Change the definition of "RTT" in 3.4 to "RTTOA  round trip time over air".  Change "RTT" to "RTTOA" in  11.22.6.4 (2x including Figure 11-35 but excluding following change) and Figure P-1.  Change " round trip time (RTT)" to " round trip time over air (RTTOA)" in 4.3.19.19, 11.22.6.4 | FTM | REJECT: The 802.11 definition of RTT is provided in equation 11-5, consistent with the usage in the Standard. There is no technical error. |

Discussion: CID #326 is similar to this comment and was discussed in REVmd during the Comment Collection #25 cycle. CID #326 proposed replacing RTT with ‘a two way ToF’. At that time CID #326 was rejected with the resolution “REJECTED (MAC: 2017-10-06 17:12:30Z): The 802.11 definition of RTT is provided in equation 11-5, consistent with the usage in the Standard. There is no technical error.”

Feedback from Jonathan:

The term RTT is widely used in the market place (some popular OS implementations refer to this quantity as RTT). Changing this to RTTOA while technically correct will cause unnecessary confusion in the market.