IEEE P802.11
Wireless LANs

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| Some 11mc comment resolutions related to Locationing |
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Abstract

This document contains the proposed resolutions to CIDs 5049, 5179, 5185, 5188, 6244, 6283, 6312, 6313, 6316, 6330, 6354, and 6356.

It uses REVmcDraft 4.0 as baseline.

**CIDs 5179, 5185, and 6283**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 5179 | 1741.41 | 10.24.6.4 | There is no shall statement regarding the Dialog Token of the last FTM frame in an FTM session. Please add " The Dialog Token of the last FTM frame and its retransmissions in a session shall be set to 0." | As in comment |
| 5185 |  |  | Dialog Token of 0 frames should be allowed to be retried (in the 802.11 sense, not FTM retransmission) when the Ack is not received. | As in comment |
| 6283 | 1741.00 | 10.24.6.4 | The setting of the Dialog Token in the last FTM frame is not clear | Add "or in the last Fine Timing Measurement frame in an FTM session" after "Dialog Tokens field values of consecutive Fine Timing Measurement frames shall be consecutive, except when the value wraps around to 1" at 1740.62 and add "The Dialog Token in the final Fine Timing measurement frame shall be set to 0." after "The Follow Up Dialog Token in the initial Fine Timing Measurement frame shall be set to 0." at 1741.14 |

**Discussion:**

In 8.6.8.33, we have:

The Dialog Token field is a nonzero value chosen by the responding STA to identify the Fine Timing

Measurement frame as the first of a pair, with the second or follow-up Fine Timing Measurement frame to

be sent later. The Dialog Token field is set to 0 to indicate that the Fine Timing Measurement frame will not

be followed by a subsequent follow-up Fine Timing Measurement frame.

In 10.24.6.4, we have :

There are four ways an FTM session is terminated:

— The responding STA sends a Fine Timing Measurement frame with the Dialog Token field set to 0.

— The initiating STA sends a Fine Timing Measurement Request frame with the Trigger field set to 0.

— The initiating STA terminates the current session and requests a new session with modified Fine

Timing Measurement parameters (see 10.24.6.5 (Fine timing measurement parameter

modification)).

— After the number of burst instances indicated in the Number of Bursts Exponent field in the initial

Fine Timing Measurement frame has been reached.

**Proposed Resolution: Revised.**

***NOTE TO EDITOR :***

**Please make the following change to Section 8.6.8.33:**

The Dialog Token field is set to 0 to indicate the end of the FTM session (see **10.24.6.6 Fine timing measurement termination)**. ~~that the Fine Timing Measurement frame will not~~

~~be followed by a subsequent follow-up Fine Timing Measurement frame.~~

**Please add the following text to the end of Section 10.24.6.4:**

The last Fine Timing Measurement frame in an FTM session shall set the Dialog Token field to a value of 0, including retransmissions of the final Fine Timing Measurement frame in the FTM session.

**CID 5188**

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| 5188 | 1148.29 | 8.6.11 | In order to allow for Fine Timing Measurement frames to be robust, we should consider adding Fine Timing Measurement frames to this table. I don't think Fine Timing Measurement Request frames need to be robust, so it's probably not necessary to add them here. | As in comment |

**Discussion**

Locationing needs to consider both privacy and security. Having robust frames does not solve the privacy problem. The proposed path has additional filtering requirements on the recipient of the FTM frame without solving the privacy problem.

**Proposed Resolution: Rejected.**

Resolution: Robust frames do not solve the privacy problem. Any changes made to FTM should address both privacy and security.

**CID 6244**

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| 6244 | 1740.33 | 10.24.6.4 | Should MCS 32 be allowed for FTM | Add "MCS 32 format," before "or HT-greenfield format" at 1740.35 |
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**Discussion:**

MCS 32 has tones populated from -58 to +58. The HT-LTF portion uses 114 tones whereas the data portion uses 104 tones. Non-HT duplicate formats also have 104 data tones populated from -58 to +58, so there is really not much more bandwidth information in MCS 32. Thus, we should disallow Fine Timing Measurement frames from using it.

**Proposed Resolution : Revised.**

***NOTE TO EDITOR : Please make the following change in Section 10.24.6.4:***

The responding STA shall not transmit Fine Timing Measurement frames using Clause 16 (DSSS PHY specification for the 2.4 GHz band designated for ISM applications) or Clause 17 (High rate direct sequence spread spectrum (HR/DSSS) PHY specification) formats, MCS 32 in HT-mixed format, or HT-greenfield format.

**CID 6316**

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| 6316 | 1741.08 | 10.24.6.4 | What does "(i.e., without correcting the clock offset)" mean? | Delete the cited text |

**Discussion**

The relevant text from Section 10.24.6.4 is shown below:



**Proposed Resolution: Revised**

***NOTE TO EDITOR : Please make the following change in Section 10.24.6.4:***

Change "without correcting the clock offset" to “without applying any correction factor associated with the symbol clock frequency offset between the initiating STA and the responding STA”.

**CID 5049**

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| 5049 | 1740.31 | 10.24.5 | "initiating STA shall transmit using a single RF chain." -- there is no definition of what comprises an RF chain. Likewise at 1733.45. | Add a definition of an RF chain. |

**Discussion:** Here is the definition of receive chain in the spec



**Proposed Resolution : Revised**

***NOTE TO EDITOR : Please add the following definitions to Section 3.1 (Definitions):***

RF Chain: either a receive chain or a transmit chain.

transmit chain: The physical entity that implements any necessary signal processing to generate the transmit signal from the digital baseband. Such signal processing includes digital to analog conversion, filtering, amplification and up-conversion.

**CID 6330**

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| 6330 | 1740.31 | 10.24.6.4 | "both the responding STA and initiating STA shall transmit using a single RF chain." seems rather restrictive | Add "Fine Timing Measurement frames and the corresponding Ack frames" after "transmit" in the cited text |

**Proposed Resolution : Accepted**

**CIDs 6312 and 6313**

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| 6312 |  |  | The technical improvements made to FTM should where possible be made to TM | As it says in the comment |
| 6313 |  |  | The editorial improvements made to FTM should where appropriate be made to TM | As it says in the comment |

**Proposed Resolution for CID 6312: Rejected**

Resolution: Timing Measurement protocol targets applications that require time synchronization (and not location). Parameters that are negotiated between two peers executing the Timing Measurement protocol are defined in IEEE 802.1AS and used by IEEE 802.1AS to throttle when and how often the Timing Measurement action frames are exchanged between the peers. Addition of the technical improvements made to Fine Timing Measurement (FTM) to the Timing Measurement protocol would duplicate much of what is already part of IEEE 802.1AS. In addition, IEEE 802.1AS executes over 802.1, EPoN, MoCA and 802.11. So, duplicating parts of IEEE 802.1AS in IEEE 802.11 in order to bring it being on par with FTM would be wasteful.

**Proposed Resolution for CID 6313: Rejected**

Resolution: It is not clear what specific editorial changes are referred to here. Most editorial changes to FTM were related to the Fine Timing Measurement protocol and do not apply to Timing Measurement.

**CID 6354**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6354 | 1740.38 | 10.24.6.4 | "The initiating STA may request the Fine Timing Measurement to have a certain format and bandwidth using the FTM Format And Bandwidth field of the Fine Timing Measurement Parameters element in the initial Fine Timing Measurement Request frame. The responding STA should transmit Fine Timing Measurement frames with the requested format and bandwidth. In the case of contiguous 160 MHz requests, the initiating STA can indicate whether it uses a single or two separate RF LOs. In the cases when the responding STA advertises transmission of Fine Timing Measurement frames with contiguous 160 MHz transmissions, the responding STA chooses the appropriate entry in the FTM Format and Bandwidth field depending on the number of RF LOs used by the responding STA. The responding STA shall not use a bandwidth wider than requested. The responding STA shall not use a VHT format if HT-mixed or non-HT format was requested. The responding STA shall not use an HT format if non-HT format was requested." is not clear. Is it referring to the "negotiation" phase or the actual FTM frame transmission | Make it clear that (1) the rSTA can choose what it wants in the iFTM as long as both STAs are capable of it and (2) the rSTA shall not transmit wider or more complicated than what it indicated in the iFTM |

**Proposed Resolution: Revised.**

***NOTE TO EDITOR: Please add the following paragraph to Section 10.24.6.3:***

In the case of contiguous 160 MHz requests, the initiating STA can indicate whether it uses a single or two separate RF LOs. In the cases when the responding STA advertises transmission of Fine Timing Measurement frames with contiguous 160 MHz transmissions, the responding STA chooses the appropriate entry in the FTM Format and Bandwidth field depending on the number of RF LOs used by the responding STA.

If the request was successful

— If the responding STA is ASAP capable, the responding STA’s selection of ASAP should be the same as that requested by the initiating STA.

— The responding STA’s selection of the Min Delta FTM value shall be greater than or equal to the corresponding value requested by the initiating STA.

— The responding STA's selection of the Number of Bursts Exponent value shall be 0 when the

initiating STA requests it to be 0.

***NOTE TO EDITOR : Please make the following change in Section 10.24.6.4:***

If the initiating STA requested ~~The initiating STA may request~~ the Fine Timing Measurement to have a certain format and bandwidth using the FTM Format And Bandwidth field of the Fine Timing Measurement Parameters element in the initial Fine Timing Measurement Request frame, then ~~.The~~ the responding STA should transmit Fine Timing Measurement frames with the requested format and bandwidth. ~~In the case of contiguous 160 MHz requests, the initiating STA can indicate whether it uses a single or two separate RF LOs. In the cases when the responding STA advertises transmission of Fine Timing Measurement frames with contiguous 160 MHz transmissions, the responding STA chooses the appropriate entry in the FTM Format and Bandwidth field depending on the number of RF LOs used by the responding STA.~~

For the Fine Timing Measurement frames transmitted during the FTM session,

* + The responding STA shall not use a bandwidth wider than requested.
	+ The responding STA shall not use a VHT format if HT-mixed or non-HT format was requested.
	+ The responding STA shall not use an HT format if non-HT format was requested

~~The responding STA shall not use a bandwidth wider than requested. The responding STA shall not use a VHT format if HT-mixed or non-HT format was requested. The responding STA shall not use an HT format if non-HT format was requested.~~

**CID 6356**

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| --- | --- | --- | --- | --- |
| 6356 | 1736.49 | 10.24.6.3 | If an iSTA does not request ASAP it should not be forced to do it | Add "The responding STA's selection of the ASAP value shall be 0 when the initiating STA requests it to be 0." to the list of rules |

**Discussion:** The relevant text is below:



**Proposed Resolution: Rejected.**

Resolution: The present language in the spec of “should” is sufficient to account for both ASAP=0 and ASAP=1 cases. If the iSTA does not like the choice made by the responding STA, the iSTA can send an FTM Request frame with the value of the Trigger field set to 0 to end the FTM session.

**References:**

[**https://mentor.ieee.org/802.11/dcn/15/11-15-0532-06-000m-revmc-sponsor-ballot-comments.xls**](https://mentor.ieee.org/802.11/dcn/15/11-15-0532-06-000m-revmc-sponsor-ballot-comments.xls)

[**https://mentor.ieee.org/802.11/dcn/15/11-15-0565-05-000m-revmc-sb-mac-comments.xls**](https://mentor.ieee.org/802.11/dcn/15/11-15-0565-05-000m-revmc-sb-mac-comments.xls)