IEEE P802.11
Wireless LANs

|  |
| --- |
| 802.11Resolutions to a few LB249 comments – Part 1(relative to IEEE 802.11 REVmd D3.0 and P802.11az D2.0) |
| Date: 2020-01-12 |
| Author(s): |
| Name | Company | Address | Phone | Email |
| Ganesh Venkatesan | Intel Corporation | 2111 NE 25th Ave, Hillsboro, OR 97124 | 503 334 6720 | ganesh.venkatesan@intel.com |
|  |  |  |  |  |

**Abstract**

This submission proposes resolutions to the following LB249 CIDs: 3163, 3164, 3561, 3563, 3564, 3165, 3166, 3167, 3565, 3572, 3577, 3578, 3583, 3439, 3579, 3580, 3581, 3585, 3169, 3586, 3314, 3483, 3915, 3984, 3425, 3853, 3032, 3033, 3436, 3134, 3437, 3438, 3611, 3440, 3441, 3442, 3828, 3490, 3034, 3035, 3231, 3232, 3965 and 3840.

History:

R0: Initial Version

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3163 | 114.00 | 32 | 11.22.6.2 | "Capability Information field, Non-TB Ranging Responder, TB Ranging Responder, Passive TB" setence (paragraph) is broken an it is missing a part | replace with "Capability Information field, Shall set the Non-TB Ranging Responder, TB Ranging Responder, Passive TB" | Revise. Incorporate editor instructions in submission 11-20/0126 corresponding to CID 3163. |

Discussion:

1. Clause 11.22.6.2 in D2.0 starts with an editor instruction to “insert the following paragraphs” and has the first two paragraphs that are in the baseline but have been modified in PIEEE802.11az D2.0. These paragraphs should be shown as modified (and not as new “insertions” to the baseline).
2. Additionally, the author recalls submissions related to resolving comments from LB240 that included editor instructions to remove low level details (e.g., First Path Training Supported, LoS Assessment Tx, LoS Assessment Rx, Secure ToF Supported field/subfield settings) from 11.22.6.2 and move them to Cl. 11.22.6.3.2 or Cl. 11.22.6.3.5 as appropriate). It appears that the corresponding editor instructions were not implemented in D2.0.
3. Also, the setting of the referred fields namely non-TB Ranging Responder, TB Ranging Responder, Passive TB Ranging Responder Measurement Support and Passive TB Ranging Initiator Measurement Support fields, are not based on the STA’s DMG or EDMG capability and are set based on what the implementation supports while operating in the 2.4/5/6 GHz bands.
4. The text that referring to low level capabilities (First Path Beamforming, LoS Assessment Tx, LoS Assessment Rx and Secure ToF Support) and is proposed to be deleted below actually belongs in clauses 11.22.6.3.5, 11.22.6.3.6 and 11.22.6.3.4 respectively. So deleting from Cl. 11.22.6.2 does not cause any loss of requirements.

Resolution: REVISE.

***Editor: Modify the following paragraphs as shown below:***

A STA in which dot11FineTimingMsmtRespActivated is false shall set the Fine Timing Measurement Responder field of the Extended Capabilities element for non-DMG STA or the Fine Timing Measurement Responder subfield of the DMG Capabilities element for DMG STA (#3163) to 0.
A STA in which dot11FineTimingMsmtInitActivated is false shall set the Fine Timing Measurement Initiator field of the Extended Capabilities element for non-DMG STA or the Fine Timing Measurement Responder subfield of the DMG Capabilities element for DMG STA (#3163) to 0.

***TGaz Editor: Delete the following paragraphs in P114L30-48, P115L1-2:***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3164 | 114.00 | 47 | 11.22.6.2 | "An EDMG STA that additionally supports Direction Measurement" - this feature is also part of DMG, as DMG covers also EMDG, the text should refer to DMG | replace with "A DMG STA that additionally supports Direction Measurement" | REVISE. The referred text is deleted as a result of the resolution to CID 3163.The corresponding text in Cl. 11.22.6.3.6 covers both DMG and EDMG STAs.No specification changes required. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3561 | 114.00 | 30 | 11.22.6.2 | "A DMG STA, that have set to 1 either the Fine Timing Measurement Responder or the Fine 30Timing Measurement Initiator subfields of the DMG Fine Timing and Range Measurement 31Capability Information field, Non-TB Ranging Responder, TB Ranging Responder, Passive TB 32Ranging Responder Measurement Support and Passive TB Ranging Initiator Measurement 33Support fields of the Extended Capabilities element to 0. (#2126, #2127, #2129) " makes no sense (seems a verb is missing) and even if it did the "either" seems suspect (it suggests the condition does not hold if both sides are true) | Delete the cited text | Accept. The resolution CID #3163 includes deleting the cited text.No further changes needed to the specification. |
| 3563 | 114.00 | 35 | 11.22.6.2 | "An EDMG STA that have set to 1 either the Fine Timing Measurement Responder or the the Fine 35Timing Measurement Initiator subfields of the DMG Fine Timing and Range Measurement 36Capability Information may set one or more of the following fields to 1: " -- what's more important is what they must be set to in other circumstances. Also not clear about the "either" and bad grammar | Change to "An EDMG STA that has set to 0 the Fine Timing Measurement Responder and FineTiming Measurement Initiator subfields of the DMG Fine Timing And Range MeasurementCapability Information field shall set all of the following fields to 0: ". Delete "if itsupports ranging based on EDMG OFDM PPDUs" at line 44 | Revise.The referred text is deleted as a result of resolving CID #3163.No further changes needed to the specification. |
| 3564 | 114.00 | 44 | 11.22.6.2 | I'm guessing this was supposed to be part of the list | Prepend "- The" | REVISE. The referred text is deleted as part of resolving CID 3163.No further specification changes needed. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3165 | 115.00 | 4 | 11.22.6.2 | "If the STA in which dot11FineTimingMsmtRespActivated is true supports Passive TB Ranging." - the "then" part of the "if" is missing - probably the next sentence | Replace "." with "," at the end of the sentence, Repalce "It" with "it" at the beginning of the next sentence. | Revise.Incorporate instructions in 11-20/0126 corresponding to CID #3165. |
| 3166 | 115.00 | 9 | 11.22.6.2 | "If the STA in which dot11FineTimingMsmtInitActivated is true supports Passive TB Ranging. It" - the "then" part of the "if" is missing - probably the next sentence | Replace "If the STA in which dot11FineTimingMsmtInitActivated is true supports Passive TB Ranging. It" with "If the STA in which dot11FineTimingMsmtInitActivated is true supports Passive TB Ranging, it" | Revise.Incorporate instructions in 11-20/0126 corresponding to CID #3165. |

Discussion:

In addition to the edits proposed by the commenter this clause is expected to relate setting of MIB variables to the corresponding setting(s) of field(s) in the Extended Capabilities element. The use of “supports Passive TB Ranging” should therefore either be “dot11PassiveTBRangingInitiatorImplemented is true” or “dot11PassiveTBRangingResponderImplemented is true”.

Resolution: Revise

***TGaz Editor: Modify the following paragraphs in P115L4-15 as shown below:***

A STA in which both dot11FineTimingMsmtRespActivated and dot11PassiveTBRangingResponderImplemented (#3165) are true, shall set the Passive TB Ranging Responder Measurement Support field of the Extended Capabilities element to 1. Otherwise it shall set the Passive TB Ranging Responder Measurement Support field of the Extended Capabilities element to 0.

A STA in which dot11FineTimingMsmtInitActivated and dot11PassiveTBRangingInitiatorImplemented (#3166) are true, shall set the Passive TB Ranging Initiator Measurement Support field of the Extended Capabilities element to 1. Otherwise it shall set the Passive TB Ranging Initiator Measurement Support field of the Extended Capabilities element to 0.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3167 | 115.00 | 16 | 11.22.6.2 | "is true supports. (#1515) (a) Phase Shift Feedback," - The "then" part of the sentece apears as a new pargraph - the sentence is broken | Replace "." at end of the sentence with ",", combine the next pargraph with this pargraph as a single paragraph | Revise.Editor to incorporate instructions in submission 11-20/0126 corresponding to CID 3167. |

Discussion:

In addition to the issues raised by the commentor need to address how the MIB variables are logically related and refer to the MIB variable dot11PhaseShiftFeedbackImplemented which indicates support (or otherwise) for Phase Shift Feedback.

Resolution: Revise.

***TGaz Editor: Change if paragraph in P115L14-19 as shown below:***

A STA in which either dot11TriggerBasedRangingRespImplemented and dot11NonTriggerBasedRangingRespImplemented are true, or dot11PassiveTBRangingInitiatorImplemented and dot11PassiveTBRangingResponderImplemented are true, and dot11PhaseShiftFeedbackImplemented is true (#3167) shall set the Phase Shift Feedback Support field in the Extended Capabilities element to 1. Otherwise it shall set the Phase Shift Feedback Support field in the Extended Capabilities element to 0.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3565 | 115.00 | 4 | 11.22.6.2 | "If the STA in which dot11FineTimingMsmtRespActivated is true supports Passive TB Ranging. 4It shall set the Passive TB Ranging Responder Measurement Support field of the Extended 5Capabilities element to 1. Otherwise it shall set the Passive TB Ranging Responder Measurement 6Support field of the Extended Capabilities element to 0. " -- if support for RSTA implies support for PSTA (and lack of support for RSTA implies lack of support for PSTA), then there's no need to signal the latter | Get rid of the Passive TB Ranging Responder Measurement Support field and Passive TB Ranging Initiator Measurement Support field | Reject. The repetition of the field name for both cases (when it is set to 1 and when it is set to 0) may sound redundant. However, the usage “Otherwise it shall be set to 0” is ambiguous in the context since it is not clear what ‘it’ refers to. |
| 3572 | 116.00 | 7 | 11.22.6.3.1 | "using Format and Bandwidth 7in the range 31 through 41" -- magic numbers are a bad idea | "using a Format And Bandwidth field value that indicates DMG or EDMG format". Also in last para | Revise.Incorporate editor instructions in 11-20/0126 corresponding to CID 3572. |

Discussion: Agree that using magic numbers is a bad idea. But ‘indicates DMG or EDMG format” could be considered unclear and could trigger more comments. A better solution would be “using a Format And Bandwidth field value that indicates DMG or EDMG format (see Table 9-281 Format And Bandwidth field).”.

Resolution:Revise.

***TGaz Editor: Replace all occurrences of “using Format And Bandwidth in the range 31 through 41 (inclusive)” with “using a Format And Bandwidth field value that indicates DMG or EDMG format (see Table 9-281 Format And Bandwidth field).”***

***Note: In some instances, “(inclusive)” is not part of the text to be replaced.***

***P66L13-14***

***P66L23-24***

***P67L6-7***

***P116L7-8***

***P116L12-13***

***P116L26-27***

***P117L26-27***

***P117L32-33***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3577 | 116.00 | 25 | 11.22.6.3.1 | "An ISTA shall not initiate a Fine Timing Measurement Negotiation for a session that is not a 25Trigger-Based, non-Trigger-Based or Fine Timing Measurement session with a Format and 26Bandwidth not in the range 31 through 41 with Protected Dual of Fine Timing Measurement 27Request frame. (#2523, #2524) " -- the triple negative with unclear precedence is impossible to decipher | As it says in the comment | Revise. Incorporate instructions in submission 11-20/0126 corresponding to CID #3577. |

Resolution: Revise

***TGaz Editor: Modify the two paragraphs in P116L20-28 as shown below:***

A Secure Fine Timing Measurement Session is established when an ISTA and a RSTA establish a security context and use it to exchange the initial Fine Timing Measurement Request frame and the corresponding initial Fine Timing Measurement frame in the Protected Dual of Public Action frame format (see Cl. 9.6.10 Protect Dual of Public Action frames), and the negotiation completes successfully.

An ISTA shall not initiate a Fine Timing Measurement Negotiation to negotiate a session with a Format And Bandwidth indicating non-DMG or non-EDMG format (see Table 9-281 Format And Bandwidth field) for an EDCA based ranging measurement exchange using (#3577) Protected Dual of Fine Timing Measurement Request frame. (#**2523**, #**2524**)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3578 | 116.00 |  | 11.22.6.3.1 | There are various references to types of session being "Trigger-Based, non-Trigger-Based or Fine Timing Measurement session", but these types of session are not defined anywhere. Also, surely a vanilla/legacy FTM session is a non-TB session? | As it says in the comment | Revise.Incorporate instructions in submission 11-20/0126 corresponding to CID #3578. |

Discussion: Agree with the commenter. There is no definition of the different types of ranging sessions. Propose to define the ranging session types in Cl. 11.22.6.3.1.

Resolution: Revise.

***TGaz Editor: Insert the following at P116L6 as shown below:***

A FTM session is characterized based on the measurement exchange that gets executed as part of the session. A FTM session can be one of the following types (#3578):

* EDCA based ranging session: The underlying measurement exchange procedure is as described in Cl. 11.22.6.4 (EDCA based ranging measurement exchange), If the corresponding Format And Bandwidth of the negotiated ranging session indicates a DMG or EDMG format (see. Table 9-281 Format And Bandwidth field), the ranging session is a DMG ranging or an EDMG ranging session respectively.
* Trigger based (TB) ranging session: The underlying measurement exchange procedure is as described in Cl. 11.22.6.4.3 (TB raning measurement exchange). When a security context is established prior to the establishment of this type of ranging session and is used to negotiate the ranging session, the session is termed secure TB ranging session. If the underlying measurement exchange is as described in Cl. 11.22.6.4.8 (Measurement exchange in Passive TB ranging mode) the ranging session is termed Passive TB ranging session.
* Non-Trigger based (non-TB) ranging session: The underlying measurement exchange procedure is as described in Cl. 11.22.6.4.4 (non-Trigger based ranging measurement exchange). When a security context is established prior to the establishment of this type of ranging session and is used to negotiate the ranging session, the session is termed secure non-TB ranging session.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3583 | 116.00 | 7 | 11.22.6.3.1 | "range 31 through 41" or "range 31 through 41 (inclusive)" -- magic numbers are a bad idea. Also "(inclusive)" is not necessary given 1.4 in the baseline | Say "using a Format And Bandwidth field value that indicates DMG or EDMG format" for all 8 instances | Revise. Duplicate of CID #3572.No further specification changes required. |
| 3439 | 117.00 | 6 | 11.22.6.3.2 | Clarify whether the BW can be more than the BSS operating BW for the associated STAs. If the answer is yes, other places need to be updated since the PPDU transmitted within the BSS is more than the BSS operating BW. This is disallowed by BSS operation. | change the text per the comment. | Revise.Incorporate instructions in submission 11-20/0126 corresponding to CID #3439 |

Discussion: Cl. 10.6.5.7 outlines constraints for transmissions of unicast frames within the BSS while associated (with the exception of off-channel TDLS transmissions) – where the CH\_BANDWIDTH in the most recently received HT Operation element limits the channel bandwidth used for the transmission. This constraint applies automatically and supercedes the negotiated Format And Bandwidth for the session. Additional constraint(s) need not be called out explicitly but adding a note describing this would be helpful.

Consider the scenario where the ISTA and RSTA establish a FTM session first where a the negotiated Format And Bandwidth is larger than the operating channel bandwidth used by the RSTA (in the BSS); and the ISTA gets associated with the RSTA later. This change in the relationship between the ISTA and RSTA should result in the channel bandwidth of FTM transmission(s) from the RSTA the ISTA (and the corresponding Acks from the ISTA to the RSTA) to be limited to that of the operating bandwidth of the BSS (even in the middle of a FTM burst). This constraint will be relaxed when the ISTA and the RSTA are no longer associated.

If the ISTA and RSTA are associated, and the ISTA initiates negotiation by sending an initial Fine Timing Measurement Request to the RSTA, it could specify any Format And Bandwidth value (including the No Preference value). If the negotiation is successful the RSTA constrains the Format And Bandwidth value in the initial Fine Timing Measurement frame to that of the operating channel bandwidth of the BSS (or lower).

Resolution: Revise.

***Editor: Insert a note as shown below in Cl. 11.22.6.3.1 before P115L6:***

NOTE—If the initiating STA and the responding STA are associated, the channel bandwidth used in the frame exchanges between the initiating STA and the responding STA during the ranging measurement exchange is constrained by the rules listed in Cl. 10.6.5.7 (Rate selection for other individually addressed management and data frames) and in Cl. 10.6.6.6 (Channel width selection for control frames), if the initiating STA and the responding STA are associated. (#3439)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3579 | 117.00 | 7 | 11.22.6.3.2 | "the BSS operation BW ." not defined (and spurious space) | Change to "the BSS bandwidth" | Revise.Incorporate instructions in submission 11-20/0126 corresponding to CID #3579. |

Resolution: Revise.

***TGaz Editor: modify the text in P117L6-7 as shown below:***

The initiating STA shall indicate, in the Format and Bandwidth field, a format and bandwidth that it supports, and this may be different from the bandwidth of the operating channel of the (#3579) BSS.(#**1015**, #**1516**).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3580 | 117.00 | 25 | 11.22.6.3.2 | "A STA that supports TB or Non-TB Ranging is not required to support EDCA-based HE. " -- a STA that doesn't support TB or non-TB randing is not required to support EDCA-based HE either, so this statement has no value | Delete the cited text | Revise. Incorporate the editor instructions corresponding to CID #3580 in submission 11-20/0126. |

Discussion: The intent of this statement was to state that STA operating in the 6GHz band (HE STA) are not required to support EDCA based ranging measurement exchange.

Resolution: Revise. Discuss Accept as an alternative.

***TGaz Editor: modify P117L25 as shown below:***

A STA that supports TB or Non-TB Ranging is not required to indicate the value EDCA-based HE in the Format And Bandwidth field of the Fine Timing Measurement Parameters element included in the initial Fine Timing Measurement Request frame to initiate negotiation of a FTM session for EDCA based ranging measurement exchange while operating in the 6GHz band. (#3580)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3581 | 117.00 | 20 | 11.22.6.3.2 | "at least one of 20the STAs does not support TB or Non-TB Ranging" not clear: might mean does not support either, or does not support at least one of them | Change to "at least one of 20the STAs does not support TB ranging and does not support Non-TB Ranging" | Revise. Incorporate the editor instructions corresponding to CID #3581 in submission 11-20/0126. |

Discussion: the intent was to state how [HE] STAs operating in the 6GHz band could negotiate the EDCA based ranging measurement exchange session if either the ISTA or the RSTA or both implementation(s) do(es) not support TB and non-TB ranging measurement exchange.

The definition of a Responding STA is a STA that has the Fine Timing Measurement Responder field of the Extended Capabilities element to 1.

Resolution: Revise

***TGaz Editor: Modify the paragraph in P117L19-24 as shown below:***

The initiating STA shall indicate an EDCA-based HE format in the Format And Bandwidth field sent to a responding STA if and only if the STAs are operating in the 6 GHz band, at least one of the STAs does not support TB and (#3581) Non-TB Ranging; otherwise the STA shall not indicate an EDCA-based HE format in the Format And Bandwidth field.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3585 | 117.00 | 26 | 11.22.6.3.2 | "For EDCA based ranging where the value of the corresponding Format and Bandwidth subfield is 26in the range 31 through 41 (inclusive), the initiating STA shall indicate, in the Ranging Priority 27subfield of the Fine Timing Measurement Parameters field of the Fine Timing Measurement 28Parameters element in the initial Fine Timing Measurement Request frame, its ranging priority 29according to Table 9-281c Definition of EDMG Ranging Priority Subfield" -- as the xref indicates, this is only defined for EDMG so is not defined when the FaB is 31. Also no idea what "corresponding" is trying to say here | Change to start "For EDCA based ranging where the Format and Bandwidth subfield indicates EDMG format,". Change next sentence to "Otherwise, the Ranging Priority subfield of the Fine 32Timing Measurement Parameters field of the Fine Timing Measurement Parameters element is 33reserved. (#1801) " | Revise. Incorporate editor instructions corresponding to CID #3585 in submission 11-20/0126.Clarification to the commenter: “corresponding” refers to the initial Fine Timing Measurement Request and intial Fine Timing Measurement frames which include a Fine Timing Parameters element that has Format And Bandwidth subfield. The value of this subfield in these frames dictate if the Ranging Priority subfield is reserved or otherwise. |

Discussion: The first part of this comment – use of magic numbers 31 and 41 is addressed by the resolution to CID #3572.

Resolution: Revise.

***TGaz Editor: Modify the following paragraph in P117L26-34 as shown below:***

For EDCA based ranging where the value of the corresponding Format and Bandwidth subfield indicates DMG or EDMG format (see Table 9-281 Format And Bandwidth field) , the initiating STA shall indicate, in the Ranging Priority subfield of the Fine Timing Measurement Parameters field of the Fine Timing Measurement Parameters element in the initial Fine Timing Measurement Request frame, its ranging priority as described in Table 9-281c (Definition of EDMG Ranging Priority Subfield when included in the initial Fine Timing Measurement Request frame). (#3585) . Otherwise, the Ranging Priority subfield of the Fine Timing Measurement Parameters field of the Fine Timing Measurement Parameters element is reserved.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3169 | 119.00 | 28 | 11.22.6.3..2 | "For EDMG ranging, the ISTA shall indicate," this paragraph partialy repeats the text in P117L26-34, it contains outdated terms and wrong references. | combine the two pargraphs, adding the second part of this pargraph at the end | Revise. Incorporate editor instructions corresponding to CID #3169 in submission 11-20/0126. |

Discussion: The first of the referred text is already covered in P116L26-34 (behaviour of the ISTA for EDCA based ranging while operating in DMG/EDMG bands). The second part of the referred text is misplaced. The second part only applies if the negotiation was successful, and hence should be part of the bulleted list that deals with behaviour when the negotiation is successful.

Resolution: REVISE.

***TGaz Editor: Insert a new bullet at the end of the list in P119L17 as shown below:***

— The responding STA’s selection of the value of the FTMs Per Burst field should be the same as the one requested by the initiating STA if the requested value of the Burst Duration field is set to a value indicating no preference (see Table 9-280 (Burst Duration field encoding)), subject to the responding STA’s policy on the maximum value of the FTMs Per Burst field.
— The responding STA’s selection of Burst Period shall be greater than or equal the responding STA’s selection of Burst Duration

— when the Format And Bandwidth subfield indicates DMG or EDMG format, the responding STA’s setting of the Ranging Priority as defined in Table 9-281d (Definition of the EDMG Ranging Priority subfield when included in the initial Fine Timing Measurement frame) (#3169)

***TGaz Editor: delete the paragraph in P119L28-34.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3586 | 119.00 | 28 | 11.22.6.3.2 | "ISTA shall indicate, in the Ranging Priority subfield of the Fine Timing 28Measurement Parameters field of the Fine Timing Measurement Parameters element in the initial 29Fine Timing Measurement Request frame, its ranging priority according to Table x1 in 9.4.2.167. 30The" duplicates 117.26 | Delete the cited text | Accept.Resolution to CID #3169 includes the action proposed by the commenter.No further specification changes required. |
| 3314 | 22.00 | 18 | 4.3.19.19 | PASN is required if and only if the peers are not associated. Be explicit in describing the condition(s) under which PASN is required. | Replace "between two peers" with "between two unassociated peers" | Accept. |

Resolution: Accept.

***TGaz Editor: Modified the following paragraph in P22L18-20 as shown below:***

The Pre-association Security Negotiation protocol enables setting up the required security context to protect the frames exchanged in order to establish a FTM session between two unassociated (#3314) peers and on successful establishment of a FTM session to perform the measurement exchanges.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3483 | 22.00 | 6 | 4.3.19.19 | The change tracking seems wrong. As far as I can tell, the baseline text for this subclause is just "Fine timing measurement allows a STA to accurately measure the round trip time (RTT) between it andanother STA. With the regular transfer of Fine Timing Measurement frames it is possible for the recipientSTA to track changes in its relative location with other STAs in the environment." | As it says in the comment | Revise. Incorporate editor instructions corresponding to CID #3483 in submission 11-20/0126. |

Discussion: The changes to the baseline text are incorrectly depicted in D2.0.

Resolution: Revise

***TGaz Editor: Modify baseline text showing how it was changed in TGaz, as shown below. Ensure that the text in the TGaz draft shows the deleted text in black color with the struck through attribute; and the inserted text is shown in black color with the underlined attribute***:

Fine timing measurement allows a STA to accurately measure the round trip time (RTT) between it and another STA. With the execution of the Fine Timing Measurement procedure (#3483) it is possible for the recipient STA to track changes in its relative location with other STAs in the environment.

***TGaz Editor: The text in the draft should look as shown below:***

Fine timing measurement allows a STA to accurately measure the round trip time (RTT) between it and another STA. With the ~~regular transfer of Fine Timing Measurement frames~~ execution of the Fine Timing Measurement procedure it is possible for the recipient STA to track changes in its relative location with other STAs in the environment.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3915 | 22.00 | 26 | 4.3.19.19 | "When the negotiated FTM session is over DMG, security parameters can be negotiated to ensure that the measurement exchange is executed with the intended peer". Missing EDMG | Add EDMG to the text. | Accept. |

Resolution: Accept

***TGaz editor: Modify the paragraph in P22L24-28 as shown below:***

⎯EDCA based exchange of Fine Timing Measurement frames where location estimates are based on Time of Departure and Time of Arrival of the exchanged FTM frames and their corresponding acknowledgements. When the negotiated FTM session is over DMG or EDMG (#3915), security parameters can be negotiated to ensure that the measurement exchange is executed with the intended peer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3984 | 22.00 | 16 | 4.3.19.19 | "The changes are not required after discussed it ... ." This seems to be an editorial note that should be removed. | Remove the sentence. | Accept. |

Resolution: Accept (or Revise)

***TGaz editor: Either delete the text in P22L16-17 or explicitly label it as ‘editor notes’ to avoid interpretation of the deleted text below as part of the amendment.***

DMG and EDMG devices can also estimate the direction of the transmission (Angle of Departure) of frames transmitted to and reception (Angle of Arrival) of frames received from a peer, allowing for estimating position using measurements obtained from frame exchanges with a single peer (#**1759, #1760, #1901, #2485**, #**2486**, #**2487**, #**2488**).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3425 | 29.00 | 2 | 6.3.56 | It is not clear what is the reference for the time difference | change the text per the comment. | Reject. The referred text is baseline text and not new in the TGaz amendment. Also the time reference is the timestamp counter (the counting rate of this counter is implementation specific). What the referred text states is that the timestamp counter value may be captured at a convenient point (implementation specific) in the transmit (or receive) path and appropriate compensation be applied to account for the difference in the timestamp counter value between when it was captured and the value of the timestamp counter corresponding to the event (at the tx or the rx antenna connector). |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3853 | 71.00 | 14 | 9.4.2.296 | "The Ranging Parameters element contains a set of fields and optional subelements." is utterly content-free | Delete the cited text | Accept. |

Resolution: Accept

***TGaz Editor: Modify the paragraph in P71L14-19 as shown below:***

**9.4.2.296 Ranging Parameters element**

The Ranging Parameters element is optionally included in the initial Fine Timing Measurement Request frame, as described in 9.6.7.32 (Fine Timing Measurement Request frame format), and the initial Fine Timing Measurement frame, as described in 9.6.7.33 (Fine Timing Measurement frame format). The use of the Ranging Parameters element is described in 11.22.6 (Fine timing measurement (FTM) procedure).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3032 | 72.00 | 6 | 9.4.2.296 | Field name "Value" in figure 9-1006 is not a descriptive name. The text refers to it and explains, but the field name should be more descriptive. | Use a better name | Reject. The baseline has a similar subfield (see 9.4.2.167 Fine Timing Measurement Parameters element).The name is descriptive – the value associated with the Status Indication.Note that the descriptiveness of the field name can be subjective. |
| 3033 | 72.00 | 6 | 9.4.2.296 | Table in figure 9-1006 has Reserved bits in the middle, without any reason. Pack the used bits and have ALL reserved bits at the end. | Pack the used bits and have ALL reserved bits at the end. | Reject. The Ranging Parameters field in the Ranging Parameters element is similar to the Fine Timing Measurement Parameters field in the Fine Timing Measurement Parameters element.1. The reserved bits (B22 and B23) allows for keeping the fields (where possible and makes sense) aligned at an octet boundary
2. This enables reuse of implementation to parse these fields whereever possible. Packing the bits and moving the reserved bits to the end will not allow for this.
 |
| 3436 | 72.00 | 14 | 9.4.2.296 | The field name of ""Value" doesn't provide the meaning of the field. | Change the field name. | Reject. Duplicate of CID #3032. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3134 | 73.00 | 27 | 9.4.2.296 | "set to 0 to indicate that the first path reporting in the ISTA2RSTA LMR" - what about first path Reproting - something is missing in this sentence. | May be change "first path reporting" to "first path reported" | Revise. Incorporate the editor instructions corresponding to CID #3134 in submission 11-20/0126. |

Resolution: Revise

***TGaz Editor: Modify the paragraph in P73L16-32 as shown below:***

The I2R TOA Type subfield in the initial Fine Timing Measurement Request frame is set to 1 to indicate that the ISTA supports phase shift type TOA feedback and is set to 0 to indicate that the first path reporting type TOA feedback in the ISTA2RSTA LMR. The I2R TOA type in the initial Fine Timing Measurement frame is set to 1 to indicate that the RSTA requires the TOA feedback type in the ISTA2RSTA LMR to be phase shift type of TOA feedback, corresponding to the average linear phase across the subcarriers and is set to 0 to indicate that the RSTA requires the first path reporting type TOA feedback in the (#3134) ISTA2RSTA LMR.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3437 | 73.00 | 11 | 9.4.2.296 | This is not a normal IEEE language. | Remove it or attach it to another sentence | Revise. Incorporate the editor instructions corresponding to CID #3437 in submission 11-20/0126  |

Resolution: Revise

***TGaz Editor: concatenate the paragraph in P73L11 with the previous paragraph.***

The ISTA2RSTA LMR Feedback subfield in the Initial Fine Timing Measurement frame is set to 1 to indicate that the RSTA requests an LMR report from the ISTA at the end of each ranging exchange, and is set to 0 otherwise. See 11.22.6.4.2.4 (TB Measurement Reporting Phase) and 11.22.6.4.3.3 (Measurement Report). (#3437)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3438 | 73.00 | 12 | 9.4.2.296 | This statement is not true since per the paragraph of P123L33 an ISTA can set this field to 1 while a RSTA set it to 0. | change the text per the comment. | Reject.The referred statement is not in contradiction with the one P123L33. The statement in deals with the case where the ISTA has indicated (using Secure LTF Support field) of its support for Secure LTF feature which the RSTA (that supports Secure LTF) to require Secure LTF for the negotiated session. |
| 3611 | 73.00 | 26 | 9.4.2.296 | "The I2R TOA Type subfield in the initial Fine Timing Measurement Request frame is set to 1 to 26indicate that the ISTA supports phase shift type TOA feedback and is set to 0 to indicate that the 27first path reporting in the ISTA2RSTA LMR. The I2R TOA type in the initial Fine Timing 28Measurement frame is set to 1 to indicate that the TOA feedback type in the ISTA2RSTA LMR 29to be phase shift type of TOA, corresponding to the average linear phase across the subcarriers 30and is set to 0 to indicate that, and the ISTA2RSTA LMR TOA feedback type to be the first path 31reporting. " -- as far as I can tell in the IFTMR it's a capability indication and in the IFTM it's the request | Change to "The I2R TOA Type subfield in the initial Fine Timing Measurement Request frame is set to 1 toindicate that the ISTA supports phase shift type TOA feedback in the ISTA2RSTA LMR and is set to 0 to indicate that it does not. The I2R TOA type in the initial Fine TimingMeasurement frame is set to 1 to request that the TOA feedback in the ISTA2RSTA LMRbe the phase shift type TOA feedback, corresponding to the average linear phase across the subcarriers,and is set to 0 to request that the ISTA2RSTA LMR TOA feedback type be first pathreporting. " | Revise. This issue is resolved as a result of addressing CID # 3134.No further specification changes required. |
| 3440 | 74.00 | 13 | 9.4.2.296 | The first sentence is not needed since it is clear per the the format. | Remove the first sentnce. | Revise. Incorporate the editor instructions corresponding to CID #3440 in submission 11-20/0126. |

Resolution: Revise.

***TGaz Editor: Modify the paragraph in P74L13 as shown below:***

The Immediate R2I Feedback and Immediate I2R Feedback subfields indicate if the R2I and I2R Location Measurement Report (LMR) is delayed or immediate (#3440). The value of 0 indicates a delayed feedback, in which case the measurement results included in the LMR frame are from the previous measurement; the value of 1 indicates an immediate feedback, in which case the measurement results included in the LMR frame are from the current measurement. The Immediate R2I Feedback and Immediate I2R Feedback subfields correspond to the RSTA-to-ISTA LMR or ISTA-to-RSTA LMR respectively.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3441 | 74.00 | 15 | 9.4.2.296 | It is not in the current LMR frame. It is in the LMR frames of the negotiated ranging session. | change the text per the comment. | Revise. The issue identified in this CID is addressed by the resolution to CID #3441. No further specification changes are required. |
| 3442 | 74.00 | 26 | 9.4.2.296 | In the initial Fine Timing Measurement frame the Immediate I2R Feedback should be reserved. | change the text per the comment. | Revise. Incorporate the editor instructions corresponding to CID #3442 in submission 11-20/0126. |

Discussion: To render consistency between how the Immediate R2I LMR Feedback is set in IFTMR and how the Immediate I2R LMR Feedback is set in IFTM, the Immediate I2R Feedback in IFTM should be rendered reserved.

Resolution: Revise

***TGaz Editor: Modify the paragraph in P74L24-28 as shown below:***

The Immediate I2R Feedback field in the initial Fine Timing Measurement Request frame is set to one to indicate immediate feedback in the ISTA-to-RSTA LMR and is set to zero to indicate delayed feedback. In the initial Fine Timing Measurement frame the Immediate I2R Feedback field is reserved**.** (#3441, #3442)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3828 | 74.00 | 13 | 9.4.2.296 | "The Immediate R2I Feedback and Immediate I2R Feedback subfields are each one bit wide. The" is duplication of the figure | Change to "For the Immediate R2I Feedback and Immediate I2R Feedback subfields," | Revise. Duplicate of CID #3440. |
| 3490 | 75.00 | 9 | 9.4.2.296 | "The Device Class and Full Bandwidth I2R MU-MIMO subfields are defined in Table 9-322b, 9Subfields of the HE PHY Capabilities Information field." -- no such table, and the table caption should be in parens, not after a comma. There is a Table 9-321b--Subfields of the HE PHY Capabilities Information field, but it doesn't contain a "Full Bandwidth I2R MU-MIMO subfield" (for obvious reasons) | As it says in the comment | Revise.Incoporte the editor instructions corresponding to CID #3490 in submission 11-20/0126. |

Discussion: The correct reference is Table 9-321b is in PIEEE802.11ax D6.0. The Full Bandwidth I2R MU-MIMO in Table 9-321b is Full Bandwidth UL MU-MIMO.

Resolution: Revise.

***TGaz Editor: Modify the paragraph in P75L9-12 as shown below:***

The Device Class and Full Bandwidth I2R MU-MIMO subfields correspond to the Device Class and Full Bandwidth UL MU-MIMO fields (#3490) defined in Table 9-322b (Subfields of the HE PHY Capabilities Information field). For associated STAs the value of the Device Class and Full Bandwidth I2R MU-MIMO subfields are equal to that of the value of the Device Class and Full Bandwidth UL MU-MIMO fields respectively that is exchanged during association.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3034 | 76.00 | 3 | 9.4.2.296 | What is "Subelement ID (0)" ? What is the "(0)"? Should be a better name than (0) and (1) | Use a more descriptive name | Reject. The field name is Subelement ID (and is descriptive of the function it serves). The value in parenthesis identifies the value of the Subelement ID as defined in Table 9-1001. |
| 3035 | 76.00 | 22 | 9.4.2.296 | What is "Subelement ID (1)" ? What is the "(1)"? Should be a better name than (0) and (1) | Use a more descriptive name | Reject. The field name is Subelement ID (and is descriptive of the function it serves). The value in parenthesis identifies the value of the Subelement ID as defined in Table 9-1001. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3231 | 76.00 | 3 | 9.4.2.296 | Figure 9-1007--Non-TB specific subelement format still has a field "Immediate LMR Feedback". Since the Ranging Parameters field has both I2R and R2I Immediate feedback subfields, this is redundant | Remove and change to "Reserved" | Revise.Incorporate the editor instructions corresponding to CID #3231 in submission 11-20/0126. |

Discussion: Agree that the Immediate LMR Feedback field needs to be removed. Should this bit be rendered reserved? Or should the Min Time Between Measurements be rendered 24 bits wide?

Resolution: Revise.

***TGaz Editor: Modify Figure 9-1007 Non-TB specific subelement format as shown below:***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B15 | B16 | B17 B39 | B40 B59 | B60 B63 |
|  | Subelement ID (0) | Length | Reserved(#3231) | Min Time Between Measurements | Max Time Between Measurements | Reserved |
| Bits: | 8 | 8 | 1 | 23 | 20 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3232 | 76.00 | 22 | 9.4.2.296 | In Figure 9-1008--TB Specific subelement format the "Availability Window" field is in the middle, wouldn't it be easier to put this variable length field at the end so all the other fields are in predictable positions? | Move "Availability Window" field to the end of the element | Reject. While the size of the Availability Window is variable, its size is known (and is indicated by the value in the length field of the Availability Window element). Hence it does not matter if the field is in the middle of the sub-element or at the end; and is still deterministically parseable. |
| 3965 | 76.00 | 21 | 9.4.2.296 | Figure 9-1008--TB Specific subelement format shows a "Response" bit.The bit is not defined and there is no reference to this bit. | Remove "Response" bit | Revise. Incorporate the editor instructions corresponding to CID #3965 in submission 11-20/0126. |

Resolution: Revise.

***TGaz Editor: Modify Figure 9-1008 TB specific subelement format as shown below:***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |
|  | Subelement ID (1) | Length | Availability Window | AID/RSID | Reserved(#3965) | Trigger Frame Padding Duration | Passive TB Ranging | Max Session Exp | BSS Color Information |
| Bits: | 8 | 8 | Variable | 16 | 1 | 2 | 1 | 4 | 8 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3840 | 78.00 | 16 | 9.4.2.296 | "The range of valid values for Max Session Exp is 0 to 15 with corresponding 16maximum time duration values ranging from 256 milliseconds to 140 minutes." -- this is obvious for a 4-bit field. This would only be needed to be stated if not all possible 4-bit values were allowed, but they are | Delete the cited text | Accept.Incorporate the editor instructions corresponding to CID #3840 in submission 11-20/0126. |

Resolution: Accept.

TGaz Editor: Modify the paragraph in P78L14-18 as shown below:

The Max Session Exp field is the time before which a new measurement exchange between the ISTA and RSTA should be initiated and completed. This value is computed as 2(Max Session Exp + 8) milliseconds. The Max Session Exp field is reserved in an initial FTM Request frame.