IEEE P802.11  
Wireless LANs

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| LB240 CID Resolutions – Fine timing measurement parameters element - Amendment text | | | | |
| Date: 2019-07-16 | | | | |
| Author(s): | | | | |
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|  |  |  |  |  |

Abstract

This document proposes resolutions to comments related to the Fine timing measurement parameters element.

The followind TGaz LB240 CIDs have proposed resolutions here: 1121, 1508, 1383, 1509, 1635, 1629, 1791, 2247, 1210, 1062, 1066, (and 1089).

The following CIDs are already addressed in D1.2: 1630, 2246, 1208, 2265, 1708, 1064, 1211, 1065, 1096, and 1629.

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** | **Addressed** |
| 1121 | 38.32 | 9.4.2.167 | Figure 9-618 includes a new field "Secure ToF Measurement" which should only be used for DMG/eDMG and NOT for the existing FTM sequence for <7GHz. | Add a text describing this field is only used for DMG/eDMG and perhaps a note that the field is not applicable to the existing EDCA FTM ranging (page 39, lines 8-13). |  | Y |
| 1066 | 39.1 | 9.4.2.167 | Why Ranging Priority applies only to EDMG only? | Make it DMG and EDMG. |  | Y |
| 1629 | 39.00 | 9.4.2.167 | Fields are contained within an element. Fields contain subfields. The Fine Timing Measurement Parameters field cannot contain Secure ToF Measurement field but can contain a Secure ToF Measurement subfield. | Refer to the attributes of the FTM Parameters field as subfield(s) instead of field(s). This may be a REVmd issue as well (Status Indication subfield, Value subfield, etc., are referred as Status Indication field and Value field in the baseline). |  | Y |
| 1630 | 39.00 | 9.4.2.167 | Secure ToF Supported [sub?]field is not depicted in Figure 9-618 but is described in P40L10-13. | Delete lines 10-13 in page 39. If Secure ToF Measurement subfield is set to 1, it implies that the ISTA supports Secure ToF. |  | Y |
| 1508 | 39.01 | 9.4.2.167 | The 802.11az draft is using reserved bit 7 in the Fine Timing Measurement Parameters Field for 'Secure ToF Measurement' negotiation'. It seems to me we should be able to move this bit to one of the new elements as only with 802.11az can we do secure ranging. That way we are keeping this bit free for other purposes for which we may not be able to add new elements so easily. | Free up the reserved bit 7 in the Fine Timing Measurement Parameters here used for 'Secure ToF Measurement' negotiation'. Move this bit to one of the new elements that deals with secure ranging. |  | Y |
| 1509 | 39.01 | 9.4.2.167 | The 802.11az draft is using reserved bits 48 and 49 in the Fine Timing Measurement Parameters Field for 'EDMG Ranging Priority'. It seems to me that we should be able to move these bits to one of the new elements as EDMG Rangiung Priority is an 802.11az feature. That way we are keeping these bit free for other purposes for which we may not be able to add new elements for so easily. | Free up the reserved bit 48 and 49 in the Fine Timing Measurement Parameters here used for 'EDMG Ranging Priority'. Move these bits to one of the new elements. |  | Y |
| 2246 | 39.08 | 9.4.2.167 | Are there one or two bits in FTM parameters field format. Line 8 talks about Secure ToF Measurement field and line 10 talks about Secure ToF Supported. There seems to be only a single bit in the figure | Clarify if it is the same bit |  | Y |
| 1208 | 39.10 | 9.4.2.167 | The text about the secure ToF supported is out of place because the field was moved to the EMDG Capabilities element | remove lines 10-13 |  | Y |
| 2265 | 39.10 | 9.4.2.167 | Secure ToF Supported field is not present in FTM parameters field format |  |  | Y |
| 1062 | 40.01 | 9.4.2.167 | "Table 9-281 doesn't include CB3 (6480MHz) for SC and OFDM. | 1062 |  |  |
| 2247 | 40.01 | 9.4.2.167 | Table 9-281 includes HE format w/ 20, 40, 80, and 160 MHz bandwidth. Does this mean legacy FTM that does not use TB/non-TB exchanges can be used with HE? Ideally it would be good to have just one way to measure with HE | Clarify - perhaps some of the BW/Format values are applicable to HE ranging only, as these values are referenced also by ranging parameters element | Revised. Specify that legacy FTM cannot use HE PPDUs. | Y |
| 1210 | 40.10 | 9.4.2.167 | PDMG specifc parameters - this subelement does not exist - the line should be removed from the table | Remove line from table |  | Y |
| 1064 | 42.05 | 9.4.2.167 | Inconsistent naming regarding PDMG.  - Table 9-281a uses PDMG.  - Text description on page 42 line 5 uses PDMGz  - Text references it to 9.6.7.32 where there are some definitions which look different.  Text should be much more coherent | Make the text and names coherent |  | Y |
| 1211 | 42.05 | 9.4.2.167 | "PDMGz" should be PEMDG | replace PDMGZ with PEDMG |  | Y |
| 1065 | 42.11 | 9.4.2.167 | Inconsistent naming: "The format of the PEDMG Specific Parameters subelement is shown in 9-619c (PDMGz Specific 11 Parameters subelement format)." ?!?! | Make the text and names coherent |  | Y |
| 1635 | 43.00 | 9.4.2.167 | Does the Ranging Priority subfield in Fine Timing Parameters field apply only to DMG/EDMG ranging (and not for RSTA Centric EDCA based FTM ranging over 2.4/5 GHz)? Lines 15-16 seem to imply so. Note that Ranging over DMG/EDMG without the use of Direction Measurement capabilities is also RSTA Centric EDCA based FTM Ranging. So Lines 15-16 seem contradictory. | "it would be better (less confusing) to move these bits to a new optional subelement or to the DMG Direction Measurement Parameters (possibly rename this subelement to DMG Ranging and Direction Measurement Parameters subelement); or replace |  | Y |
| 1791 | 43.15 | 9.4.2.167 | The concept of urgency makes perfect sense. However, it is unlikely that STAs would only need emergency ranging when supporting DMG, and never with other methods. Emergency should eb a feature of FTM, not band-dependent. | Allow Ranging Priority value for EDCA-based FTM ranging, except in old-FTM compatibility mode. | Reject. For non-TB and TB ranging the Ranging Priority is signalled in the Ranging Parameters field in the Ranging Parameters element. | Y |
| 1383 | 43.16 | 9.4.2.167 | We should leave at least 1 Reserved bit in the FTM Parameters field. A good example is L-SIG (17.3.4.1 in 802.11-2016). Can we simplify Ranging Priority to have 1 bit: urgent or not urgent? | Change Table 9-281c to have 2 values : No priority, High |  | Y |
| 1708 | 47.00 | 9.4.2.167 | "Clarify ""The Secure ToF Supported field is set to 1 in the initial Fine Timing Measurement Request frame to indicate that an ISTA supports a secure ToF measurement exchange."". | 1708 |  | Y |
| 1096 | 50.15 | 9.4.2.167 | "The use of PEDMG in section 9.4.2.167 is a mixup. PEDMG is EDMG and not ONLY secured. It should be named Secured EDMG or SEDMG. | 1096 |  | Y |
| 1089 | 51.01 | 9.4.2.167 | It is not clear how the Secret Key is derivated on both sides of the link | Add text to explain |  | Y |

**Acronyms**

EDMG - Enhanced directional multi-gigabit (802.11ay)

DMG - Enhanced directional multi-gigabit (802.11ad)

**Secure ToF Measurement and EDMG Ranging Priority subfields in the Fine Timing Measurements parameters field**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 1121 | 38.32 | 9.4.2.167 | Figure 9-618 includes a new field "Secure ToF Measurement" which should only be used for DMG/eDMG and NOT for the existing FTM sequence for <7GHz. | Add a text describing this field is only used for DMG/eDMG and perhaps a note that the field is not applicable to the existing EDCA FTM ranging (page 39, lines 8-13). | Revised. Specifying that the Secure ToF Measurement field applies only to EDMG and not to DMG, EDCA-based, TB or non-TB ranging. |
| 1508 | 39.01 | 9.4.2.167 | The 802.11az draft is using reserved bit 7 in the Fine Timing Measurement Parameters Field for 'Secure ToF Measurement' negotiation'. It seems to me we should be able to move this bit to one of the new elements as only with 802.11az can we do secure ranging. That way we are keeping this bit free for other purposes for which we may not be able to add new elements so easily. | Free up the reserved bit 7 in the Fine Timing Measurement Parameters here used for 'Secure ToF Measurement' negotiation'. Move this bit to one of the new elements that deals with secure ranging. | Revised.  The Fine Timing Measurement Parameters element is extensible so we don’t need to worry about using up the reserved bit. Also, added text that this bit is still reserved for DMG, EDCA-based, TB, and non-TB ranging. |
| 1383 | 43.16 | 9.4.2.167 | We should leave at least 1 Reserved bit in the FTM Parameters field. A good example is L-SIG (17.3.4.1 in 802.11-2016). Can we simplify Ranging Priority to have 1 bit: urgent or not urgent? | Change Table 9-281c to have 2 values : No priority, High | Revised. Adding text specifying that the 'Secure ToF Measurement' subfield only applies to EDMG ranging.  For the DMG, EDCA-based, TB and non-TB ranging cases the bit is still reserved. The ‘EDMG Ranging Priority’ subfield is already reserved for EDCA-based FTM ranging. Add text reserving it also for TB and non-TB ranging. |
| 1509 | 39.01 | 9.4.2.167 | The 802.11az draft is using reserved bits 48 and 49 in the Fine Timing Measurement Parameters Field for 'EDMG Ranging Priority'. It seems to me that we should be able to move these bits to one of the new elements as EDMG Rangiung Priority is an 802.11az feature. That way we are keeping these bit free for other purposes for which we may not be able to add new elements for so easily. | Free up the reserved bit 48 and 49 in the Fine Timing Measurement Parameters here used for 'EDMG Ranging Priority'. Move these bits to one of the new elements. | Revised. These bits are still reserved for the RSTA centric EDCA-based FTM ranging. Adding text reserving it also for TB and non-TB ranging. |
| 1635 | 43.00 | 9.4.2.167 | Does the Ranging Priority subfield in Fine Timing Parameters field apply only to DMG/EDMG ranging (and not for RSTA Centric EDCA based FTM ranging over 2.4/5 GHz)? Lines 15-16 seem to imply so. Note that Ranging over DMG/EDMG without the use of Direction Measurement capabilities is also RSTA Centric EDCA based FTM Ranging. So Lines 15-16 seem contradictory. | "it would be better (less confusing) to move these bits to a new optional subelement or to the DMG Direction Measurement Parameters (possibly rename this subelement to DMG Ranging and Direction Measurement Parameters subelement); or replace | Revised. These bits are still reserved for the RSTA centric EDCA-based FTM ranging. Add text reserving it also for TB and non-TB ranging. |
| 1629 | 39.00 | 9.4.2.167 | Fields are contained within an element. Fields contain subfields. The Fine Timing Measurement Parameters field cannot contain Secure ToF Measurement field but can contain a Secure ToF Measurement subfield. | Refer to the attributes of the FTM Parameters field as subfield(s) instead of field(s). This may be a REVmd issue as well (Status Indication subfield, Value subfield, etc., are referred as Status Indication field and Value field in the baseline). | **Already addressed in D1.2.** |
| 1066 | 39.01 | 9.4.2.167 | Why Ranging Priority applies to EDMG only? | Make it DMG and EDMG as well. | Accept. |

**Discussion**

See comment resolutions with discussions in table above.

***TGaz Editor: Change the text in subclause 9.4.2.167 (“Fine Timing Measurement Parameters element”)***

***TGaz Editor: Change the text in D1.2 P40L1 as follows:***

For EDMG ranging, the Secure ToF Measurement subfield is set to 1 by an ISTA to request a secure ToF measurement exchange between an ISTA and an RSTA (see 11.22.6.3.3). The Secure ToF Measurement subfield is set to 1 by an RSTA to acknowledge a secure ToF Measurement exchange. Otherwise the Secure ToF Measurement field is set to 0. **(#2056)(#1383)(#1121)**

For DMG, EDCA-based, and non-TB/TB ranging the Secure ToF Measurement field is reserved**.(#1382)(#1121)(#1508)(#1383)(#1635)\_**

***TGaz Editor: Change the text in D1.2 P43L22 as follows:***

For DMG and EDMG ranging, the EDMG 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 contains the ISTA’s Ranging Priority request which indicates the time sensitivity of a ranging operation, and it is set according to Table 9-281c. **(#1066)**

For RSTA centric EDCA-based FTM ranging, TB and non-TB ranging, the EDMG Ranging Priority subfield of the Fine Timing Measurement Parameters field of the Fine Timing Measurement Parameters element is reserved. **(#1383)(#1509)(#1635)**

**Secure ToF Supported field**

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| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 1630 | 39.00 | 9.4.2.167 | Secure ToF Supported [sub?]field is not depicted in Figure 9-618 but is described in P40L10-13. | delete lines 10-13 in page 39. If Secure ToF Measurement subfield is set to 1, it implies that the ISTA supports Secure ToF. | Already addressed in D1.2. |
| 2246 | 39.08 | 9.4.2.167 | Are there one or two bits in FTM parameters field format. Line 8 talks about Secure ToF Measurement field and line 10 talks about Secure ToF Supported. There seems to be only a single bit in the figure | Clarify if it is the same bit | Already addressed in D1.2. |
| 1208 | 39.10 | 9.4.2.167 | The text about the secure ToF supported is out of place because the field was moved to the EMDG Capabilities element | remove lines 10-13 | Already addressed in D1.2. |
| 2265 | 39.10 | 9.4.2.167 | Secure ToF Supported field is not present in FTM parameters field format |  | Already addressed in D1.2. |
| 1708 | 47.00 | 9.4.2.167 | "Clarify ""The Secure ToF Supported field is set to 1 in the initial Fine Timing Measurement Request frame to indicate that an ISTA supports a secure ToF measurement exchange."". | 1708 | Already addressed in D1.2. |

**Discussion**

Already addressed in D1.2.

**Ranging Priority for non-TB and TB Ranging**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 1791 | 43.15 | 9.4.2.167 | The concept of urgency makes perfect sense. However, it is unlikely that STAs would only need emergency ranging when supporting DMG, and never with other methods. Emergency should eb a feature of FTM, not band-dependent. | Allow Ranging Priority value for EDCA-based FTM ranging, except in old-FTM compatibility mode. | Reject. Don’t think we have a good way to distinguish between ‘new’ FTM ranging and ‘old’ FTM ranging. Probably is better to only enable the ranging priority feature in the new ranging modes.  For non-TB and TB ranging the Ranging Priority is signalled in the Ranging Parameters field in the Ranging Parameters element. |

**Discussion**

Proposed resolution is ‘Reject’.

Don’t think we have a good way to distinguish between ‘new’ FTM ranging and ‘old’ FTM ranging. Probably is better to only enable the ranging priority feature in the new ranging modes.

For non-TB and TB ranging the Ranging Priority is signalled in the Ranging Parameters field in the Ranging Parameters element.

**Use of HE PPDU in Legacy FTM Ranging**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 2247 | 40.01 | 9.4.2.167 | Table 9-281 includes HE format w/ 20, 40, 80, and 160 MHz bandwidth. Does this mean legacy FTM that does not use TB/non-TB exchanges can be used with HE? Ideally it would be good to have just one way to measure with HE | Clarify - perhaps some of the BW/Format values are applicable to HE ranging only, as these values are referenced also by ranging parameters element | Revised. Creating separate table for nTB/TB ranging referred to from the Ranging Parameters Element to clarify that HE formats do not apply the legacy FTM. |
| 1062 | 40.1 | 9.4.2.167 | Table 9-281 doesn’t include CB3 (6480 MHz) for SC and OFDM. This option is stated as supported in 29.11. | Add the missing two lines. | Accepted. |

**Discussion**

Creating separate table for nTB/TB ranging referred to from the Ranging Parameters Element to clarify that HE formats do not apply the legacy FTM.

***TGaz Editor: Change the text in subclause 9.4.2.167 (“Fine Timing Measurement Parameters element”) as follows:***

…

***Change the Table 9-281 Format And Bandwidth field as follows:***

|  |  |  |
| --- | --- | --- |
| **Field value** | **Format** | **Bandwidth (MHz)** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| 17-30 | Reserved | Reserved |
| 31 | DMG | 2160 |
| 32 | EDMG (Single Carrier Mode) | 2160 |
| 33 | EDMG (Single Carrier Mode) | 4320 |
| 34 | EDMG (Single Carrier Mode) | 8640 |
| 35 | EDMG (Single Carrier Mode) | 2160+2160 |
| 36 | EDMG (Single Carrier Mode) | 4320+4320 |
| 37 | EDMG (OFDM) | 2160 |
| 38 | EDMG (OFDM) | 4320 |
| 39 | EDMG (OFDM) | 8640 |
| 40 | EDMG (OFDM) | 2160+2160 |
| 41 | EDMG (OFDM) | 4320+4320 |
| 42 | EDMG (Single Carrier Mode) | 6480 |
| 43 | EDMG (OFDM) | 6480 |
| ~~32~~44-63 | Reserved | Reserved |

**(#2247)(#1062)**

…

***TGaz Editor: Add a Figure 9-1006b to the Subclause 9.4.2.279 (“Ranging Parameters element”) as shown below:***

|  |  |  |
| --- | --- | --- |
| Field value | Format | Bandwidth |
| 0 | HE | 20 |
| 1 | HE | 40 |
| 2 | HE | 80 |
| 3 | HE | 80+80 |
| 4 | HE (two separate RF Los) | 160 |
| 5 | HE (single RF LO) | 160 |
| 6-63 | Reserved | Reserved |

**Figure 9-1006b Format and Bandwidth subfield (#2247)**

***TGaz Editor: Edit text in Subclause 9.4.2.279 (“Ranging Parameters element”) as shown below:***

***TGaz Editor: Change the text in D1.2 P49L30 as follows:***

The Format and Bandwidth subfield indicates the requested or allocated PPDU format and bandwidth used to transmit the uplink and downlink NDP frames exchanged as part of the non-TB ranging or TB Ranging measurement exchange (See 11.22.6.4.2 (Measurement exchange in TB mode) and 11.22.6.4.3 (Measurement exchange in Non-TB mode)). The encoding of this subfield is given in Table 9-1006b (Format and Bandwidth subfield).

**PDMG/PEDMG naming**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 1210 | 40.10 | 9.4.2.167 | PDMG specifc parameters - this subelement does not exist - the line should be removed from the table | Remove line from table | Accepted. |
| 1064 | 42.05 | 9.4.2.167 | Inconsistent naming regarding PDMG. | 1064 | **Already addressed as editorial.** |
| 1211 | 42.05 | 9.4.2.167 | "PDMGz" should be PEMDG | replace PDMGZ with PEDMG | **Already addressed as editorial.** |
| 1065 | 42.11 | 9.4.2.167 | Inconsistent naming: "The format of the PEDMG Specific Parameters subelement is shown in 9-619c (PDMGz Specific 11 Parameters subelement format)." ?!?! | Make the text and names coherent | **Already addressed as editorial.** |
| 1096 | 50.15 | 9.4.2.167 | "The use of PEDMG in section 9.4.2.167 is a mixup. PEDMG is EDMG and not ONLY secured. It should be named Secured EDMG or SEDMG. | 1096 | **Already addressed as editorial.** |

**Discussion**

There is no subelement called ‘PDMG Specific Parameters’. Remove line from table. Proposed resolution: Accept.

***TGaz Editor: Change the text in subclause 9.4.2.167 (“Fine Timing Measurement Parameters element”) as follows:***

***TGaz Editor: Change Table 9-281a (“Optional Subelement IDs for Fine Timing Measurement Parameters”) as shown below:***

**Table 9-281a - Optional Subelement IDs for Fine Timing Measurement Parameters (#1210)**

|  |  |  |
| --- | --- | --- |
| **Subelement ID** | **Name** | **Extensible** |
| 0 | DMG Direction Measurement Parameters | Yes |
| 1 | PEDMG Specific Parameters | Yes |
| 2-220 | Reserved |  |
| 221 | Vendor Specific |  |
| 222-255 | Reserved |  |

**Secret Key Derivation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 1089 | 51.01 | 9.4.2.167 | It is not clear how the Secret Key is derivated on both sides of the link | Add text to explain | Reject. |

**Discussion**

Reject. Should be explained… Refer to appropriate Section.

**References:**

**[1] Draft P802.11az\_D1.2**