IEEE P802.11  
Wireless LANs

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| LB240 Clause 11 PXDMG CIDs | | | | |
| Date: 2019-08-12 | | | | |
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|  |  |  |  |  |

Abstract

This document proposes resolutions to LB240 CIDs: 2384, 1283, 1213, 1284, 2472, 1285, 2099, 2100, 2372, 2095, 1078, 1431, 1231, 1084, 1085, 1098, 1939, 1954, 1947, 1951, 1994, 1955, 2035, 2052, 2066, 2092, 2107, 1981, 2023, 2378, 2439, 2215, 1944, 1429, 1108, 1379, 1073, 1421, 1199

Base is Draft\_P802.11az\_D1.4

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| 2384 | 121.40 | 11.22.6.4.9 | Section 11.22.6.4.9 Secure EDMG Measurement Exchange Protocol has couple of clarification need to be added to better describe the protocol | Contribution to be submitted. | **Reject – contribution did not materialize – commenter OK to reject** |

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| 1283 | 122.24 | 11.22.6.4.9 | "Due to rule a) and/or rule b,": what are rules a) and b)? I don't see such listing in this pargraph. Also "and/or" is not appropriate here, use "and" instead | one of the indented lists should be converted to a list form with a), b) etc. Not sure which | Revise as in 11-19-1507 |

***TGaz Editor: Change the text in P150L30-31 and P151 L1-12 as follows:***

1. If FTM retransmission is successful, the ISTA may derive the RTT using the received 29 ToA (t4) and ToD (t1) values included in the retransmitted Fine Timing Measurement frame, and t2 and t3 values estimated locally in the prior (or preceding) fine timing measurement.
2. During the FTM retransmission, the t2 value estimated by the ISTA shall not be used for RTT calculation in the subsequent fine timing measurement. This is because the t2 was estimated by correlating two unmatched secure TRN as a result of FTM retransmission
3. During the FTM retransmission, the t4 value estimated by the RSTA shall not be included in the subsequent Fine Timing Measurement frame. This is because the t4 was estimated by correlating two unmatched secure TRN as a result of FTM retransmission.
4. Due to rules b and c, (#1283) the fine timing measurement immediately after the FTM retransmission shall not be used by ISTA for RTT calculation
5. A successful FTM retransmission shall only be counted towards to the total number of FTMs Per Burst value

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| 1213 | 122.28 | 11.22.6.4.9 | The text about the Ranging parameters priority subfield is a copy of the text in 9.4.2.167. There is no clear behavior associated with the values of the field. What does the priority mean in terms of behavior. Is it priority between ISTAs? Is Priority over data? | Clarify what behavior is expected for each priority level. | **Revise as in 11-19-1507** |

Discussion:

This text is not specific to Secure ranging and was inserted here by mistake. After discussion with those that contributed the text it is agreed to leave the interpretation of the priority to the implementation.

***TGaz Editor: Remove the text in P151 L13-25***

***TGaz Editor: Remove the text in P152 L1-3***

***TGaz Editor: Change the text in P152 L4-10 as follows:***

If an RSTA does not perform FTM retransmission, the maximum number of Fine Timing Measurement frame retransmissions the RSTA might attempt to zero, the RSTA shall send a new Fine Timing Measurement frame (with ToA=0, ToD=0, updated Dialog Token) with new Secure TRN (associated with the updated dialog token) appended.

***TGaz Editor: insert the following text at P134L11 (end of 11.22.6.4.7.1)***

A PEDMG ISTA sets a value for the Ranging Priority subfield of the Fine Timing Measurement Parameters field of the Fine Timing Measurement Paraemters element in the initial Fine Timing Measruement Request frame from the values in table 9-281c.   The RSTA respoding to this request by setting a value for the Ranging Priority subfield of the Fine Timing Measurement Parameters field of the Fine Timing Measurement Parameters element in the initial Fine Timing Measurement frame from table 9-281d in response. How an RSTA supports ranging priority is implementation dependent. (#1213)

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| 1284 | 123.16 | 11.22.6.4.9 | "If an RSTA does not perform FTM retransmission, the maximum number of 16 Fine Timing Measurement frame retransmissions the RSTA might attempt to zero,": It si not clear if these are two conditions (in which case the ',' should be converted to either "and" or "or" or is it something else? | clarify . | **Revise as in 11-19-1507** |

***TGaz Editor: Modify the text in P152L7-10 as follows:***

If an RSTA does not perform FTM retransmission so that the maximum number of Fine Timing Measurement frame retransmissions the RSTA might attempt is zero, the RSTA shall send a new Fine Timing Measurement frame (with ToA=0, ToD=0, updated Dialog Token) with new Secure TRN (associated with the updated dialog token) appended when an FTM transmission in a secure EDMG FTM exchange failes (#1284).

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| 2472 | 124.11 | 11.22.6.4.9 | Change the para to read "An ISTA shall discard the time stamps ... if the Dialog Token field ... in the PEDMG secure ranging PPDU does not match its Dialog Token Counter." | As in comment. | **Revise (agree in principle)** |

***TGaz Editor: Change the text in P152L28-30 as follows***

An ISTA shall discard the timestamps measured from a PEDMG secure ranging PPDU if the Dialog Token field in the Protected FTM frame in the PEDMG secure ranging PPDU does not match (#2472) its Dialog Token Counter.

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| 1285 | 124.14 | 11.22.6.4.9 | It should be mentioned once in this subclause that the measurement on which t4 and t2 are based on the secure TRN sequences and not something else in the PPDU. Also some form of verification may be desired | Add text to say what the measurements should be based on. | **Revise as in 11-19-1507** |

***TGaz Editor: Add the following text after P150L28:***

— The T2 measured by the RSTA and the T4 measured by the ISTA shall be based on the secure TRN subfields. For verification of security, the RSTA and ISTA should estimate the time separately on each secure TRN subfield and verify that values estimated on different TRN subfields are equal up to a small estimation error. (#1285)

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| 2099 | 43.15 | 11.3.4.2 | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] "in an infrastructure BSS" -- so PASN cannot be used for pre-association ranging? | Clarify | **Revised as in D1.3** |

Discussion: The text was modified there is not such limitation now.

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| 2100 | 43.23 | 11.3.4.3 | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] This should be added after d), not at the end | As it says in the comment | **Accept** |

***TGaz Editor: Change the editor instruction in P97L21 as follows:***

***Insert the following sentence after “d)”: (#2100)***

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| 2372 | 161.12 | 29.9.3.5.1 | What does 211 reference? There is no Figure 211 | Replace 211 with Figure 200 | **Revised per changes proposed in 11-19-579r3** |

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| 2095 | 41.19 | 9.6.7.33 | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] "The Invalid Measurement field contains an invalid indication for the TOA field. " has no value | Delete | **Revised as in 11-19-1507** |

***TGaz Editor: Change the text in P86L7:***The Invalid Measurement field contains an indication of an invalid (#2095) TOA field. The Invalid

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| 1078 | 70.01 | 9.6.7.48 | The fields ToA, ToD, ToA Error and ToD Error in figure 9-981a refer to the timestamp and not the actual values. The names MUST be adequate. Other fields in this section have same issue. | Add "timestamp" to these names and update the text accordingly. | **Reject, the name follow the names in the FTM frame in RevMD, they are used because they are short** |

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| 1431 | 71.23 | 9.6.7.48 | "The ToA Type subfield indicates if the the ToA timestamp was calculated based on the first arrival path of the channel impulse response or the average linear phase across the subcarriers". For PDMG/PEDMG which is mainly Single Carrier an alternative definition for the ToA timestamp, to indicate measurement on the strongest tap is more appropriate. | A possible solution is to have a separate definition for the ToA timestamp for PDMG/PEDMG as follows: For PDMG/PEDMG, operating in SC mode, ToA Type subfield indicates if the ToA timestamp was calculated based on the first arrival path of the channel impulse response or the strongest tap of the channel impulse resonse. | **Reject, 9.6.7.48 is LMR frame which is not used by PDMG/ PEDMG STAs** |

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| 1231 | 72.13 | 9.6.7.48 | The Secure LTF Parameters field": these two pargraphs repeats the pagrapsh above them (with errors) and should b remvoed | Remove pargraphs | **Accept, already removed in D1.3** |

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| 1084 | 168.01 | B.4.33.1 | NGPM6 refers to NGPP5 wich doesn't exists! | FIX! | **Revise as in 11-19-1507r** |

***TGaz Editor: Add the following line at the end of the table in P206***

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| NGPP4 | Secure ranging EDMG TRN field | 29.9.3.5, 29.9.3.6, 29.9.3.7 |  | Yes  No  N/A  |

***TGaz Editor: in the line of NGPM6 in the table in P205 replace “***NGPP5” ***with “****NGPP4” (#1084)*

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| 1085 | 168.01 | B.4.33.1 | NGPM5.7 and NGPM5.8 refers to EDMG-M17.8, but the later is not relevant, and therefore lines are incorrect! | FIX! | **Revise as in 11-19-1507** |
| 1098 | 176.01 | B.4.33.1 | Annex B (PICS) in line NGPM5.7 refers to EDMG-M17.8 which is incorrect. | Replace with correct PICS from 11ay | **Revise as in 11-19-1507** |

***TGaz Editor: in the lines of NGPM5.7 and NGPM5.8 (P205) replace “***(CFISTA and EMDG-M17.7 and EDMG-M17.8):O” ***with*** “(CFISTA and EMDG-M16.7 and EDMG-M16.10):O (#1098)“

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| 1939 | 117.05 | TRUE | Excess article | Delete "the" on "in the Figure". Also "The " in "The Ranging Trigger frames " at 35.3 | **Revised** |

***TGaz Editor: In P145L12 (first line of 11.22.6.4.6a) Change the text as follows:***

Based on Figure

***TGaz Editor: Change the text in P42L11 as follows:***

Ranging Trigger frames

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| 1954 | 170.00 | TRUE | "GIe^1\_64\*NCB as defined in section 29.10;" appears twice here, but "GIe" appears nowhere else, so is clearly not defined in 29.10 | Define "GIe^1\_64\*NCB" in 29.10 | **Revise: already fixed in D1.3** |

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| 1947 |  |  | We don't use a hyphen for bit ranges | Change to put Bx at one end and By at the other, in Figures 9-61c (the second one), 9-61d, 9-61e, 9-1001, 9-1004, 9-1006, 9-1024 | **Revise as In 11-19-1507** |

***TGaz Editor: in P43L22 (9-61e)* replace the following**

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**With**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B11 | B12 B19 | B20 | B21 B24 | B25 | B26 B32 | B33 B38 | B39 |
|  | AID12/RID12 | RU Allocation | |  | | --- | | I2R FEC Coding Type | | I2R MCS | I2R DCM | SS Allocation | I2R Target RSSI | Reserved |
| bits: | 12 | 8 | 1 | 4 | 1 | 7 | 6 | 1 |

***TGaz Editor: in P44L10 (9-61f)* replace the following**

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**With**

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B11 | B12 B20 | B21 B23 | B24 B25 | B26 B31 | B32 B38 | B39 |
|  | AID12/RID12 | Reserved | I2R Rep | Reserved | SS Allocation | I2R Target RSSI | Reserved |
| bits: | 12 | 9 | 3 | 2 | 6 | 7 | 1 |

***TGaz Editor: in P45L6 (9-61g) replace the following* **

***With***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B11 | B12 B20 | B21 B23 | B24 B25 | B26 B31 | B32 B38 | B39 | B40 B55 |
|  | AID12/RID12 | Reserved | I2RRep | Reserved | SS Allocation | I2R Target RSSI | Reserved | Trigger Dependent User Info (SAC) |
| bits: | 12 | 9 | 3 | 2 | 6 | 7 | 1 | 16 |

***TGaz Editor: in P62L5 (9-1001) change the table as follows:***

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|  | B0 B8 | B9 B15 | B16 |  | B(n+15) | B(n+16) B(count-1)\*8 |
|  | Count | Reserved | Availability bit B0 | … | Availability bit Bn-1 | Padding bits |
| Bits | 9 | 7 | 1 | … | 1 | Variable |

***TGaz Editor in P63L10 (9-1004) change the table as follows:***

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|  | B0 B15 | B16 B22 | B23 | B24 B31 |
|  | Partial TSF Timer | Duration | Reserved | Periodicity |
| Bits | 16 | 7 | 1 | 8 |

***TGaz Editor: in P65L10 (9-1006) modify the table as follows;***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | B0 B1 | B2 B6 | | B7 | | | B8 | | | B9 | | B10 B11 | | B12 | B13 | | B14 | | B15 | |
|  | Status Indi-cation | Value | | ISTA-2-RSTA LMR Feedback | | | Secure LTF Req. | | | Secure LTF Support | | Ranging Priority | | R2I ToA Type | I2R ToA Type | | R2I AOA Req. | | I2R AOA Req. | |
| Bits: | 2 | 5 | | 1 | | | 1 | | | 1 | | 2 | | 1 | 1 | | 1 | | 1 | |
|  | B16 B21 | | B22 B23 | | | B24 B26 | | | B27 B29 | | B30 | | B31 | | | B32 B34 | | B35 B37 | |
|  | Format and Bandwidth | | Reserved | | | Max UL Rep | | | Max DL Rep | | Device Class | | Full Bandwidth UL MU-MIMO | | | Max DL STS ≤ 80MHz | | Max DL STS > 80MHz | |
| Bits: | 6 | | 2 | | | 3 | | | 3 | | 1 | | 1 | | | 3 | | 3 | |
|  | B38 B39 | | B40 B42 | | B43 B45 | | | B46 B47 | | |
|  | Reserved | | Max UL STS ≤ 80 MHz | | Max UL STS > 80MHz | | | Reserved | | |
| Bits: | 2 | | 3 | | 3 | | | 2 | | |

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| ***1951*** |  | Figure 9-1008 is missing the B numbers for most of the fields | As it says in the comment | ***Revise (Reject in principle, Some of the fields are variable length so the bit header cannot be added*** |

***TGaz Editor: Remove the bit heading from the first two columnts of figure 9-1008 (P60L9)***

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| 1994 |  | Do not use ^ for exponentiation. Use superscript normally, \*\* in the MIB | As it says in the comment | **Revise** |

***TGaz Editor: in table in P33 replace*** 2^48 ***with*** 248 **twice**

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| ***1995*** |  |  |  | ***TRUE*** | ***(Non-break) space needed before units*** | ***As it says in the comment (see e.g. "2.16GHz")*** |

***TGaz Editor: in P99L33 change the text as follows:***

implementation dependent. If the AP sending the message have PDMG/PEDMG (#1995) location capabilities, it should be included in the list.

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| **2035** |  |  | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] Field names should have capital letters at the starts of all words (including articles and prepositions etc.) | E.g. in F9-51e change Number of space- time streams to Number Of Space- time Streams | **Revise – name was already corrected in D1.3** |

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| **2052** |  |  | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] Bits should be numbered from 0, not 1 | As it says in the comment. E.g. fix in F9.4c and F9.4f | **Revise: fixed in D1.3 however there is an issue I P57L10** |

***TGaz Editor: in P57L10 remove the superfluous Bn headings above the figure caption***

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| **2066** |  |  | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] "thru" is an abomination | Change to "to" throughout | **Revised: there is no thru in D1.3** |

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| 2092 | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] So, is the ranging protocol called FTM (39.36) or Fine Timing Measurement (40.20) | Be consistent throughout | **Revised, agree with the commenter in principle, changes to 1.1-1.4 removed the use of the term “FTM ranging”** |

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| **2107** | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] It is unhelpful to mix "RSTA" and "responding STA" terminology | Use "RSTA" everywhere except for first instance. Ditto "ISTA" | **Reject**  **Most cases of “initiator STA” and “responder STA” are in the unchanged baseline text. Not sure we want to fix that at this point.** |

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| 1981 |  | "NDP PPDU" is pleonastic | Change to "NDP" throughout | **Reject, throughout RevMD NDP as is used as an adjective, it should not be used as a noun** |
| 2023 |  | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] "NDP PPDU" should be just "PPDU" | Change throughout | **Reject, throughout RevMD NDP as is used as an adjective, it should not be used as a noun** |

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| 2378 | 67.00 | 9.6.7.32 | "The Trigger field set to 1 indicates that the initiating STA requests that the responding STA start or continue sending Fine Timing Measurement frames (see 11.22.6 (Fine timing measurement (FTM) procedure)). The Trigger field set to 0 indicates that the initiating STA requests that the responding STA stop sending Fine Timing Measurement frames. The Trigger field is set to 2 to indicate the initiation of a PDMG/PEDGM FTM measurement exchange using the first path AWV (see 11.22.6.4.7.1 (General)). The Trigger field is set to 3 to indicate that the following FTM burst shall contain an LOS assessment measurement. If the FTM burst is performed over 12 the first path AWV and shall contain an LOS assessment measurement the Trigger field is set to 4. 13 Trigger field values 23-255 are reserved"  Trigger field value 1 and 0 apply to all STAs (legacy, EDMG/DMG) that are in the ranging session. For ASAP=0, in which the FTM Request is only sent once, how would an EDMG/DMG device sets the trigger value for session is using first path AWV (Trigger field value =2) and wants to start ranging (Trigger field value=1) ?  Also, there is no need to have value=2 since it should be implicit that PDMG/PEDMG shall use first path AWV for ranging. | Remove this sentence "The Trigger field is set to 2 to indicate the initiation of a PDMG/PEDGM FTM measurement exchange using the first path AWV (see 11.22.6.4.7.1 (General)).:" and reorder other Trigger value accordingly | **Revised, Resolved as part of 11-19-646** |
| 2439 | 67.26 | 9.6.7.32 | Does the retransmission need to be emphasised? Delete "and its retransmission". And the description that the field is optional is missing. | As in comment. | **Revised, Resolved as part of 11-19-646** |

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| 2215 | 70.08 | 11.22.6.4.9.2 | [Re-raising this comment from the comment collection, as it is not possible to determine from 18/1544r8 whether/how it was addressed. References are to the CC draft and hence may be wrong against D1.0.] "An RSTA shall transmit one or more HEz PUS Sub-variant Location Trigger frames each of which is addressed to a single ISTA a SIFS time after the HEz polling part. " is not achievable. Only the first one can be sent a SIFS after the polling part | As it says in the comment | ***Revised: Already resolved in D1.3*** |

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| 1944 | "Time of Arrival estimation using Phase Shift Feedback" -- capitalisation is all over the place | I can't remember whether the rule is all-leading-caps or lowercase-excepf-for-first-and-proper-nouns-and-abbreviations-etc but conform to it | ***Revised: Already resolved in D1.3*** |

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| *1429* |  | *9.4.2.282* |  | *TRUE* | *It is unclear who or what decides the number of AOD Feedback Fields, present.* | **Revise: As in 11-19-1507** |  |

***TGaz Editor: Add the following Heading in before P74L6 (it was in D1.0)***

**9.4.2.282 Multiple Best AWV ID element**

***TGaz Editor: Add the following as a new pargraph before P74L22 (9.4.2.283)***

The Number of AOD Feedbacks field, describing the number of AOD Feedback fields, is equal to the number of Best AWV IDs field in the last received Multiple Best AWV IDs element from the ISTA.

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| 1108 | 45.09 | 9.4.2.127.1 | Similar consideration for EDMG and other amendments. Please separate capabilities of this amendment from those of existing/under development amendments. | As in comment. | **Reject: These capabilities are inserted to the DMG capabilities element because DMG/EDMG STAs do not transmit the extended capabilities element** |  |

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| 1379 | 66.25 | 9.4.2.289 | The base of the log likelihood ratio is missing and the description of the metric is incorrect. | Change the sentence to be "The LOS Log Likelihood Ratio field is a signed two's complement 8-bit number containing 40 x log10 of the estimated ratio between the probability that the measurement is on a LOS path and the probability that the measurement is on a non-LOS path. This covers the range -31.75 dB to +31.75 dB. The value 255 indicates that the LOS Log Likelhood Ratio is not available". | Accept |
| 1073 | 66.28 | 9.5.2.289 | LOS Likelihood value needs more explanation. Essential for interop. | Add text to explain the meaning of different values | Revise as in 11-19-1507 |

***TGaz Editor: Change the text in P81L25-28 (last pargraph 9.4.2.288):***

The LOS Log Likelihood Ratio field is a signed two’s complement 8-bit number containing 40 x log10 of the estimated ratio between the probability that measurement is on a LOS path and the probability is on a non-LOS path. This covers the range -31.75 dB to +31.75 dB. A value of 255 in this field indicates that LOS Log Likelhood Ratio is not availabl.

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| 1421 | 161.12 | 29.9.3.5.1 | Following statement has errors: "with P=0, M=4, and N=0 where P is the value of the EDMG TRN-P field in the header plus one, M is the value of the EDMG TRN-M field in the header plus one and N is the value of the EDMG TRN-N field in the header plus one." | Assuming this refers to an EDMG BRP-TX packet, to obtain a configuration in which each TRN-Unit has 4 TRN subfields, \*EDMG TRN-Unit P\* shall be set to zero, \*EDMG TRN-Unit M\* shall be set to 3, and \*EDMG TRN-Unit M\* shall be set to 3. Please refer to page 425 of 11ay D3.0. | **Revised, Atlready resolved in D1.4** |

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| 1199 | 33.05 | 9.4.2.1 | Elements missing from element IDs table - Ranging Parameters, Secure LTF Parameters, Direction measurement Results element, Multiple Best AWV ID element, Multiple AOD Feedback element, LOS Likelihood element" | Add these element to table | ***Revise as in 11-19-1507*** |

***TGaz Editor: In page 48L5 (9.4.2.1) Modify the Editor instruction as follows:***

***Change the rows of Fine Timing Measurement Parameters in Table 9-94 (Element IDs) (header row shown for*** 3 ***convenience) as follows:***

***TGaz Editor: Modify the Editor instruction in P48L7 (9.4.2.1.) as follows:***

***Insert the following lines into Table 9-94: in 9.4.2.1:*** (#**1646**)

***TGaz Editor: Remove the line of “Passive Location Ranging Availability Window “ from tabe 9-94 (P48L9)***

***TGaz Editor Insert the following line at the end of table 9-94:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Element*** | ***Element Id*** | ***Element ID Extension*** | ***Extensibe*** |  |
| Ranging Parameters | 255 | <ANA> | Yes | No |
| Direction Measurement Results | 255 | <ANA> | Yes | No |
| Multiple AOD Feedback | 255 | <ANA> | Yes | No |
| Multiple Best AWV ID | 255 | <ANA> | Yes | No |
| LOS Likelihood | 255 | <ANA> | Yes | No |

**References: P802.11az\_Draft\_D1.4**