IEEE P802.11  
Wireless LANs

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| CR for remaining CIDs on Ranging Parameters field | | | | |
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Abstract

This document addresses the following CIDs: 1115, 1475, 1467, 2073, 1710, 2434, 1847, 1124, 1384, 1468, 1729, 1333, 1334, 1478, 1479, 2249, 1103, 2311.

R0: initial version.

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1115 | 27.30 | 9.3.1.23.9 | The text "The TA field for the Ranging Trigger frame is address of the RSTA transmitting the Trigger frame" needs to be modified to include the case when RSTA supports MultiBSSID and intends to include STAs from different BSSes in its TB sequence/measurement window. | Add support for reception of control frames (i.e. TA/NDPA) from transmitted BSSID for the case of Multi-BSSID. | **Revised.**  Agreed in principle with the reviewer. We have added text to clarify that all ISTAs need to support reception of Control frames from transmitted BSSID. We have modified the text as per document 11-19-1584. |

***TGaz Editor: Modify the text starting at P43L31 as:***

The TA field for the Ranging Trigger frame is set to the address of the RSTA transmitting the  
Trigger frame if the Trigger frame is addressed only to ISTAs with which that RSTA has a TB Ranging Session. The TA field is the transmitted BSSID if the Trigger frame is addressed to set of ISTAs in which at least two ISTAs have a TB Ranging session with a different BSSID in the Multiple BSSID set of the RSTA (#1115).

***TGaz Editor: Modify the text starting at P343L8 of 11ax draft 4.3 as:***

An AP with dot11MultiBSSIDImplemented equal to true shall not send a Trigger frame (other than an NFRP Trigger frame or Ranging Trigger frame) with the TA field set to the transmitted BSSID to a non-AP STA that is associated with a nontransmitted BSSID in the multiple BSSID set unless the AP has received an HE Capabilities element from non-AP STA with t`he Rx Control Frame To MultiBSS subfield in the HE MAC Capabilities Information field equal to 1(#20582, #20315) (#1115). An AP with dot11MultiBSSIDImplemented equal to true may send an NFRP Trigger frame with the TA field set to the transmitted BSSID to a non-AP STA that is associated with a nontransmitted BSSID in a multiple BSSID set.(#20048) An AP with dot11MultiBSSIDImplemented equal to true may send a Ranging Trigger frame with the TA field set to the transmitted BSSID to an ISTA that has setup a TB Ranging session with a nontransmitted BSSID in a multiple BSSID set (#1115).

***TGaz Editor: Add the following paragraph in 11.22.6.4.3.1 before the paragraph starting at P118L25:***

A RSTA, in which dot11MultiBSSIDImplemented is true, that transmits a Ranging Trigger frame or a Ranging NDP Announcement frame to a set of ISTAs in which at least two ISTAs have a TB Ranging Session with different BSSIDs in the Multiple BSSID set of the RSTA shall set the TA field of the frame to the transmitted BSSID. Otherwise the RSTA shall set the TA field of the Ranging Trigger frame or a Ranging NDP Announcement frame to its MAC address. An 11az ISTA that supports TB Ranging shall support the reception of a Control frame with TA equal to the transmitted BSSID and set the Rx Control Frame to MultiBSS subfield in HE MAC Capabilities Information field to 1 (#1115).

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1475 | 56.04 | 9.4.2.279 | How is th value of MaxToAAvailable Exp associated with TB specific session when in IFTM or IFTMR in TB specific element ? Clarify its value. | Clarify | **Revised.**  We renamed this field as “MaxSessionExp” to clarify that this indicates Maximum Session Expiry duration. We have modified the text to describe its usage as per document 11-19-1584. |
| 1467 | 56.04 | 9.4.2.279 | MaxToAAvailable  Exp should be a common parameter since its present in both TB and NTB Specific subelements but only used in one at a time. | Move them to a subfield in Ranging Parameters field if they have the same behavior. | **Reject.**  The term MaxToAAvaialble Exp no longer exists in draft 1.4 for NTB Ranging where it has been renamed as “Max Time Between Measurement”. Its size and value is different from that one for TB Ranging. |
| 2073 | 34.29 | 9.4.2.246 | [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.]  ^ | Use superscript | **Revised.**  We have modified the text as per document 11-19-1584. |
| 1710 | 61.00 | 9.4.2.279 | "The BSS Color field is an unsigned integer in the range 1 to 63 whose value is set to the same 20 BSS Color value contained in the HE Operation element that an RSTA transmit."  What is the BSS/Responder has disabled BSS Color ? | Please clarify ? | **Revised.**  **We have clarified to include the entire 8 bit BSS Color Information in Ranging Parameters field. Modified the text as below to reflect the change:**  **“**The BSS Color Information field has the same format as in the BSS Color Information field in the HE Operation element. Each subfield of the BSS Color Information field is set to the same value, as in the HE Operation element that an RSTA transmit.” See document 11-19-1584. |

***TGaz Editor: Modify Figure 9-1008 at P69L19 as:***

B0 B7 B8 B15

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Subelement ID (1) | Length | Availability Window | AID/RID | Response | Trigger Frame Padding Duration | Passive Location Ranging |

Bits: 8 8 Variable 16 1 2 1

|  |  |
| --- | --- |
| Max Session Exp | BSS Color Information |

Bits: 4 8

**Figure 9-1008—TB Specific subelement format (#1475, 1710)**

***TGaz Editor: Modify text starting at P71L13 as:***

The Max Session Exp field indicates the the maximum time by which the ISTA should complete the next round of measurements and for TB Ranging with delayed RSTA2ISTA LMR the maximum duration for which the RSTA retains the computed RSTA2ISTA LMR value. The Max Session Exp field is reserved in an initial FTM Request frame. . The maximum time duration for which the responder retains the computed ToA value = 2(Max Session Exp + 8)  milliseconds. The range of valid values for Max Session Exp  
is 0 to 15 with corresponding maximum time duration values ranging from 256 msec to 140  
minutes (#1475, 2073).

The BSS Color Information field has the same format as in the BSS Color Information field in the HE Operation element. Each subfield of the BSS Color Information field is set to the same value, as in the HE Operation element that an RSTA transmit (#1710).

***TGaz Editor: Add the following paragraph starting at P111L13 in Section 11.22.6.3.3 as:***

If the RSTA includes a TB-specific subelement in an IFTM and the Status Indication field in the IFTM is set to 1, the RSTA shall assign the value of the Max Session Exp field in the TB Ranging specific subelement in the Ranging Parameters element in the initial FTM frame. The value of this field is larger than the assigned periodicity signalled in the Periodicity subfield in the Availability Window Information field in the TB Ranging Specific subelement (#1475).

***TGaz Editor: Add the following paragraph starting at P120L15 in Section 11.22.6.4.3.2 as:***

An ISTA should respond to any TF Ranging Poll addressed to it from the RSTA before the duration signaled in the Max Session Exp field, present in the TB Ranging Specific subelement subfield  
in the Ranging Parameters field in an initial FTM frame, has elapsed from the time it last received an RSTA2ISTA LMR (#1475).

***TGaz Editor: Add the following paragraph starting at P126L14 in Section 11.22.6.4.3.4 as:***

An RSTA should provide ToA feedback to an ISTA before the duration signaled in the Max Session Exp field, present in the TB Ranging Specific subelement subfield  
in the Ranging Parameters field in an initial FTM frame, has elapsed from the time it last transmitted an RSTA2ISTA LMR to that ISTA (#1475).

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| 2434 | 51.22 | 9.4.2.279 | "The TB Specific Parameters subelement is included in ... to describe the requested set of parameters that the initiator proposes to use and in the initial FTM, if the initiator and the responder successfully negotiate and FTM session where .. is TB". Change it to read "The TB Specific Parameters subelement is included in ... to describe the requested set of parameters that the initiator proposes to use in the initial FTM, if the initiator and the responder successfully negotiate an FTM session where .. is TB mode." | As in comment. | **Revised.**  The existing text specifies the behaviour as intended as the proposed parameters are not just for initial FTM but for the entire ranging session. Modifed the text as per document 11-19-1584. |

***TGaz Editor: Modify the text starting at P69L14 in Section 9.4.2.279 as:***

The TB Specific subelement is included in the initial Fine Timing Measurement  
Request to describe the requested set of parameters that the initiator proposes to use and in the  
initial Fine Timing Measurement, if the initiator and the responder successfully negotiate a  
Fine Timing Measurement session where the negotiated ranging protocol is TB (#2434).

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1847 | 98.28 | 11.22.6.4.3.3 | The RSTA shall select one bandwidth value for the measurement sounding part based on the  Format and Bandwidth subfield of the Ranging Parameters field(s) | Clarify that a partial BW may be used e.g. if the secondary channel is busy. | **Revised.**  Modified the text as follows to calrify the BW selected for sounding :  “The RSTA shall select a bandwidth value for the measurement sounding part based on the  Format and Bandwidth subfield of the Ranging Parameters field(s) (see 9.4.2.279) provided by  each of the ISTAs during negotiation. This bandwidth shall be equal to or smaller than the bandwidth indicated by the RSTA in the initial Fine Timing Measurement frame and may  be different from the bandwidth used in the polling part and shall adhere to the rules of multiple frame transmission in an EDCA TXOP (see 10.22.2.7).” See document 11-19-1584.  Note that document 326r1 also clarifies the behaviour for secure Non-TB and TB ranging. |
| 1124 | 49.34 | 9.4.2.279 | Bandwidth for NDP should be tagged as nominal (or Max) BW to be used for both the requested (IFTMR) and allocated (IFTM) behavior. | Add the refinement/tag to the BW and also add a note to indicate 'smaller BW maybe used depending on channel condition'. | **Revised.**  Agreed in principle. However, this behaviour is already clarified in 11.22.6.4.4.2 of draft 1.2 for NTB Ranging**: “**An ISTA transmitting a Ranging NDP Announcement frame shall not use a bandwidth wider than that indicated by an RSTA in the Ranging Parameters element, in the initial Fine Timing Measurement frame.”  For TB Ranging we clarify this behaviour by modifying the text in 11.22.6.4.3.3 as follows:  “The RSTA shall select a bandwidth value for the measurement sounding part based on the  Format and Bandwidth subfield of the Ranging Parameters field(s) (see 9.4.2.279) provided by  each of the ISTAs during negotiation. This bandwidth shall be equal to or smaller than the bandwidth indicated by the RSTA in the initial Fine Timing Measurement frame and may  be different from the bandwidth used in the polling part and shall adhere to the rules of multiple frame transmission in an EDCA TXOP (see 10.22.2.7).” See document 11-19-1584 |

***TGaz Editor: Modify the text in Section 11.22.6.4.3.3 P121L1 as:***

The RSTA shall select a bandwidth value for the measurement sounding phase based on the  
Format and Bandwidth subfield of the Ranging Parameters field(s) (see 9.4.2.279) provided by  
each of the ISTAs during negotiation. This bandwidth shall be equal to or smaller than the bandwidth indicated by the RSTA in the initial Fine Timing Measurement frame and may be different from the bandwidth used in the polling phase and shall adhere to the rules of multiple frame transmission in an EDCA TXOP (see 10.22.2.7) (#1847, 1124).

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1384 | 48.04 | 9.4.2.279 | Figure 9-1006 should group the 6 Reserved bit fields together. This would allow for more flexibility in the future. | Rearrange fields so as to have the 6 Reserved bits together. | **Revised.**  In draft 1.4 there are only 4 Reserved bits and not 6. Modified the figure by aggregating those 4 bits as per document 11-19-1584. |

***TGaz Editor: Modify Figure 9-1006 as:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| B0 B1 | B2-B6 | | B7 | | | B8 | | | B9 | | B10 B11 | | B12 | B13 | | B14 | | B15 | |
| Status Indi-cation | Value | | I2R 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 B24 | | | B25 B27 | | B28 | | B29 | | | B30 B32 | | B33 B35 | |
| Format and Bandwidth | |  | | | Max I2R Rep | | | Max R2I Rep | | Device Class | | Full Bandwidth UL MU-MIMO | | | Max R2I STS  80 MHz | | Max R2I STS >  80 MHz | |
| Bits: 6 | |  | | | 3 | | | 3 | | 1 | | 1 | | | 3 | | 3 | |
| B36 | | B37 | | B38 B40 | | | B41 B43 | | | B44 B47 | | |
| Immediate R2I Feedback | | Immediate I2R Feedback | | Max I2R STS 80 MHz | | | Max I2R STS >  80 MHz | | | Reserved | | |
| Bits: 1 | | 1 | | 3 | | | 3 | | | 4 | | |

**Figure 9-1006—Ranging Parameters field format (#1384)**

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| **CID** | **Page** | | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1468 | 49.26 | 9.4.2.279 | | What is the value of R2I AOA Requested subfield in IFTM ? | Clarify | **Revised.**  See document 11-19-1584. |

***TGaz Editor: Add text starting at end of P66L32 of 9.4.2.279 as:***

The R2I AoA Requested subfield is set to 1 in the initial Fine Timing Measurement Request  
frame by the ISTA when it requests the RSTA to include AoA measurements in the RSTA2ISTA LMR in the AoA feedback field. The R2I AoA Requested subfield is set to 1 in the initial Fine Timing Measurement frame to indicate that the RSTA includes the AoA measurements in the RSTA2ISTA LMR (#1648, 1468).

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1729 | 69.36 | 9.6.7.48 | The range of the Padding bits should be B(n+16) to B[ceiling((Count+16)/8)\*8-1] rather than B(n+16) to B(count-1)\*8. | As in comment | **Revised.**  Agreed in principle with the reviewer. However, for clarity modified the text by (1)  replacing ‘n’ with ‘Count’ in Figure 9-1001 and (2) creating a separate figure to clarify that there are no Padding bits when the value in Count is a multiple of 8. See document 11-19-1584 |

***TGaz Editor: Modify the text in Section 9.4.2.277 P62L4 as:***

The ISTA Availability Information field format is shown in Figure 9-1001 and Figure 9-1002 respectively (#1729).

***TGaz Editor: Modify the Figure in P62L6 as:***



B0-B8 B9-B15 B16 B(Count+15) B(Count+16)- B[ceiling((Count+16)/8)\*8 -1]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Count | Reserved | Availability bit  B0 | … | Availability bit  BCount-1 | Padding bits |

Bits: 9 7 1 1 Variable

**Figure 9-1001 – ISTA Availability Information field format if the value of Count is not a multiple of 8** (#1729)**.**

***TGaz Editor: Add the following Figure in P62L7 as:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Count | Reserved | Availability bit  B0 | … | Availability bit  BCount-1 |

B0-B8 B9-B15 B16 B(Count+15)

Bits: 9 7 1 1

**Figure 9-1002 – ISTA Availability Information field format if the value of Count is a multiple of 8** (#1729)**.**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1333 | 58.10 | 9.4.2.279 | Shouldn't allow too many choices of max DL STS. Just like max # of STS support in sounding NDP, maybe either 4 or 8 | as in the comment | **Rejected.**  Agreed with the commenter in principle. However, in draft 1.0 the Max DL STS fields already limit the max # of STS support to 8. Note that the fields have been renamed in draft 1.4 as Max R2I STS ≤ 80MHz and  Max R2I STS > 80MHz without any change in size. |
| 1334 | 58.14 | 9.4.2.279 | Shouldn't allow too many choices in max UL STS supported. Just like in UL MUMIO, all STAs shall support 8 LTFs. | as in the comment | **Rejected.**  Agreed with the commenter in principle. However, in draft 1.0 the Max UL STS fields already limit the max # of LTFs the STA can transmit to 8 (not including repetition). Note that the fields have been renamed in draft 1.4 as Max I2R STS ≤ 80MHz and  Max I2R STS > 80MHz without any change in size. |
| 1478 | 86.34 | 11.22.6.3.3 | TB Ranging or Non-TB Ranging does not use scheduling parameters in Fine Timing Measurement Parameters element | Remove reference to Fine Timing Measurement Parameters. | **Revised.**  Removed the corresponding text and modified the spec as per 11-19-1584. |
| 1479 | 86.37 | 11.22.6.3.3 | For TB and NTB Ranging the parameters of interest is contained in the Ranging Parameters element and not the Fine Timing Measurement Parameters. | Remove reference to Fine Timing Measurement Parameters. | **Revised.**  Removed the corresponding text and modified the spec as per 11-19-1584. |

***TGaz Editor: Modify the text starting on P109L10 as:***

For TB and NTB Ranging the initial Fine Timing Measurement Request frame shall have:  
 — the Trigger field set to 1,

— a set of range measurement parameters in a Ranging Parameters element that describe the initiating STA’s availability for measurement exchange (#1478).

For TB and NTB Ranging the initial Fine Timing Measurement frame shall include a Ranging Parameters element containing either the Non-TB Specific subelement or the TB Specific subelement (#1479).

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2249 | 48.24 | 9.4.2.279 | In Figure 9-1005 Ranging parameters field says 4 octets, but the exapansion 9-1006 shows 48 bits | Fix figure 9-1005 to make ranging parameters field 6 octets | **Revised.**  This has been fixed in draft 1.4. |
| 1103 | 35.03 | 9.3.1.23.9 | Normative requirement in clause 9. | Please use avoid using shall/should/may throughout clause 9. Modify or move these in respective clauses above 9. | **Revised.**  Modify the spec as per 11-19-1584. |
| 2311 | 103.09 |  | When delayed iSTA-to-rSTA LMR is sent, the iSTA needs to communicate to the rSTA when is the earliest time and when is the latest time that the iSTA can transmit its iSTA-to-rSTA LMR. | Modify the spec so that, when delayed iSTA-to-rSTA LMR is sent, the iSTA can communicate to the rSTA when is the earliest time and when is the latest time that the iSTA can transmit its iSTA-to-rSTA LMR. | **Revised.**  This information is conveyed in draft 1.4 in the MinTimeBetweenMeasurements and MaxTimeBetweenMeasurements fields of the IFTMR. |

***TGaz Editor: Modify the text starting on P71L17 as:***

A Non-TB specific or TB specific subelement when included in the Ranging Parameters element contained in the initial Fine Timing Measurement indicates the range measurement protocol selected by the responder for the negotiated FTM session (#1103).

***TGaz Editor: Modify the text starting on P71L17 as:***

The Device Class and Full Bandwidth I2R MU-MIMO subfields are defined in Table 9-322b,  
Subfields of the HE PHY Capabilities Information field. For associated STAs their values are equal to the value of the Device Class and Full Bandwidth UL MU-MIMO subfields respectively that is exchanged during association (#1103).

***TGaz Editor: Modify the text starting on P62L19 as:***

The Padding bits subfield, when present, renders the length of the  
Availability Information field to be a multiple of 8. The value of the bits in the  
 Padding bits subfield is reserved. (#1645, 1103).

**9.4.2.278 RSTA Availability Window element**

***TGaz Editor: Delete the text starting on P71L7 as:***

The Passive Location Ranging field is set to 1 by the Initiator to request Passive Location  
Ranging operation, otherwise it is set to 0 (#1103).

***TGaz Editor: Add the text in 11.22.6.3.8 starting on P116L24 as:***

When the ISTA sets the Passive Location Ranging

field to 1 it shall include an unsolicited LCI Report in the Fine Timing Measurement Request

frame (#1103).

***TGaz Editor: Modify the text in P79L17 as:***

The value of the Dialog Token field is the value of the Sounding Dialog Token field in the Ranging  
NDP Announcement frame of the corresponding to the measurement sounding phase from which  
the reported RSTA timestamps were measured (see 11.22.6.4.3 Measurement Exchange in TB  
Mode) (#1103).

***TGaz Editor: Modify the text in P79L17 as:***

The BW subfield, defined in Table 9-1000, indicates the nominal BW used for the transmissions in the Passive Location Ranging availability window. Depending on the medium availability

the bandwidthused for the exchanged frames is equal to or smaller than the nominal BW (#1646, 1103).