IEEE P802.11  
Wireless LANs

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| SA1 Comment Resolution for seven CIDs | | | | |
| Date: 2021-12-2 | | | | |
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Abstract

This document proposes resolution for CID287866. CID287867, CID287870, CID287871, CID287872, CID287874, and CID 287875.

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| **Comment ID** | **Page** | **Subclause** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 287875 | 128 | 11.21.6.3.2 | 13 | Need a normative text for the EDCA negotiation so that RSTA assigns only one of the 160MHz BW options (3, 4 or 5) sent by ISTA so that there is no ambiguity in the 160MHz operational mode. If RSTA doesn't support any of the 160 MHz mode that ISTA support, it shall send IFTM without the 160MHz options so that other rates can be used instead i.e., 80MHz. | As per comment | Revised  Agree in principle with the commenter.  TGaz editor make the changes identified below in 11-21-1944-01-00az SA1 comment resolution for seven CIDs  <https://mentor.ieee.org/802.11/dcn/21/11-21-1944-01-00az-sa1-comment-resolutions-for-seven-cids.docx> |
| 287874 | 175 | 11.21.6.4.5.3 | 29 | Need to include normative text for ISTA sending an I2R LMR in the Secure LTF case similar to the text in P175L24-29 that is intended for RSTA. | Add the text "An ISTA transmitting an I2R LMR frame, when negotiated, containing range measurement results measured from an I2R NDP and a R2I NDP, shall include the Secure LTF Parameters element in the protected LMR frame and set the Measurement SAC subfield in the Secure LTF Parameters element in the protected LMR frame to the same value as in the SAC subfield in the STA Info field with AID equal to 2043 in the Ranging NDP Announcement frame that solicited the I2R NDP and the R2I NDP." | Revised  Agree in principle with the commenter.  TGaz editor make the changes identified below in 11-21-1944-01-00az SA1 comment resolution for seven CIDs  <https://mentor.ieee.org/802.11/dcn/21/11-21-1944-01-00az-sa1-comment-resolutions-for-seven-cids.docx> |
| 287873 | 174 | 11.21.6.4.5.3 | 19 | In the text "Or the ista-ltf-key and ltf-iv for generating secure HE-LTF based on (#1830, #1832) the values of the Secure LTF Counter (#2289) and the corresponding Validation SAC subfields in the Secure LTF Parameters element in the last protected IFTM frame or last protected LMR frame, received from the RSTA; see 11.21.6.4.5.4 (Secure LTF octet stream generation)." the Validation SAC is no longer needed as we changed derivation, see equation in P280L18-19 | Change it to "Or the ista-ltf-key and ltf-iv for generating secure HE-LTF based on (#1830, #1832) the values of the Secure LTF Counter (#2289) subfield in the Secure LTF Parameters element in the last protected IFTM frame or last protected LMR frame, received from the RSTA; see 11.21.6.4.5.4 (Secure LTF octet stream generation)." | Accept  Agree with the commenter. For clarity to TGaz editor, the text modification shown below.  TGaz editor make the changes identified below in 11-21-1944-01-00az SA1 comment resolution for seven CIDs  <https://mentor.ieee.org/802.11/dcn/21/11-21-1944-01-00az-sa1-comment-resolutions-for-seven-cids.docx> |
| 287872 | 170 | 11.21.6.4.5.2 | 28 | The text "When an LMR frame contains range measurement results measured from an I2R NDP and a R2I NDP, an RSTA that transmits the R2I LMR frame shall include the Secure LTF Parameters element in the protected LMR frame." would need to include I2R LMR when negotiated as well. | Change it to "When an LMR frame contains range measurement results measured from an I2R NDP and a R2I NDP, an RSTA and ISTA that transmits the R2I LMR and I2R LMR frame, when negotiated, respectively shall include the Secure LTF Parameters element in the protected LMR frame." | Revised  Agree in principle with the commenter with minor adjustment necessary for the proposed text language  TGaz editor make the changes identified below in 11-21-1944-01-00az SA1 comment resolution for seven CIDs  <https://mentor.ieee.org/802.11/dcn/21/11-21-1944-01-00az-sa1-comment-resolutions-for-seven-cids.docx> |
| 287871 | 169 | 11.21.6.4.5.2 | 35 | In the text "Send an HE TB Ranging NDP with the TXVECTOR parameters LTF\_KEY and LTF\_IV that are set to ista-ltf-key and ltf-iv for generating the secure HE-LTF based on (#1830, #1832) the value of the Secure LTF Counter subfield (#2289) and the corresponding Validation SAC (#3123) subfield, in the Secure LTF Parameters element in the last protected IFTM frame, or last protected LMR frame, received from the RSTA; see 11.21.6.4.5.4 (Secure LTF octet stream generation);" the Validation SAC is no longer needed as we changed derivation, see equation in P280L18-19 | Change it to "Send an HE TB Ranging NDP with the TXVECTOR parameters LTF\_KEY and LTF\_IV that are set to ista-ltf-key and ltf-iv for generating the secure HE-LTF based on (#1830, #1832) the value of the Secure LTF Counter subfield (#2289), in the Secure LTF Parameters element in the last protected IFTM frame, or last protected LMR frame, received from the RSTA; see 11.21.6.4.5.4 (Secure LTF octet stream generation);" | Accept  Agree with the commenter. For clarity to TGaz editor, the text modification shown below.  TGaz editor make the changes identified below in 11-21-1944-01-00az SA1 comment resolution for seven CIDs  <https://mentor.ieee.org/802.11/dcn/21/11-21-1944-01-00az-sa1-comment-resolutions-for-seven-cids.docx> |
| 287870 | 42 | 9.3.1.19 | 17 | The text "The VHT/HE/Ranging NDP Announcement frame contains at least one STA Info field. If the VHT/HE/Ranging NDP Announcement frame contains only one STA Info field, then in the case of VHT or HE NDP Announcement frames the RA field is set to the address of the STA that can provide feedback (see 10.37.5.2 (Rules for VHT sounding protocol sequences)), while in the case of Ranging NDP Announcement frames, the RA address is set to the address of the RSTA or ISTA that is the intended recipient of the frame." should be modified to make it specific that pme STA Info field with AID/RSID less than 2008 as the NDPA can have STA Info containing SAC and TX Power | Change it to "The VHT/HE/Ranging NDP Announcement frame contains at least one STA Info field. If the VHT/HE/Ranging NDP Announcement frame contains only one STA Info field with AID/RSID less than 2008, then in the case of VHT or HE NDP Announcement frames the RA field is set to the address of the STA that can provide feedback (see 10.37.5.2 (Rules for VHT sounding protocol sequences)), while in the case of Ranging NDP Announcement frames, the RA address is set to the address of the RSTA or ISTA that is the intended recipient of the frame." | Accept |
| 287867 | 197 | 11.21.6.6.2 | 37 | A-MPDU aggregation is used when transmitting FTM termination with the LMR frame, however in the un-associated case the peers do not know the constraint for transmitting MPDU spacing requirement for the receiver. The spec needs to include in the IFTMR and IFTM the parameter "minimum MPDU start spacing'' as defined in Table 9-282 of the baseline spec and its corresponding normative text in section 11 or include one of the values of 'minimum MPDU start spacing" i.e., 'set to 0 for no restriction' making it specific in the standard. | As per comment | Revised  Agree in principle with the commenter with minor adjustment necessary for the proposed text language  TGaz editor make the changes identified below in 11-21-1944-01-00az SA1 comment resolution for seven CIDs  <https://mentor.ieee.org/802.11/dcn/21/11-21-1944-01-00az-sa1-comment-resolutions-for-seven-cids.docx> |
| 287866 | 168 | 11.21.6.4.5.2 | 4 | Need normative text similar to the passive TB Ranging where RSTA sends Secure Sounding Ranging Trigger frame to one ISTA at a time | Add the paragraph "In a TB ranging measurement exchange with secure LTF where there are multiple ISTAs involved in the measurement sequence, the RSTA shall transmit a Secure Sounding Ranging Trigger frame which includes a single User Info field to sound a single ISTA at a time." to P168L4. | Accept |

Discussion for CID 287875.

The commentor is pointing out a potential interoperability issue when RSTA and ISTA convey their capability of 160MHz operation (i.e., 80+80 implying two LO, 160 two LO, and 160 single LO) during the negotiation and expect the other peer to be able to receive and compute RTT measurement as declaring Field value 5 implies that 4 and 3 are also supported. A similar negotiation is available for data communication in which case the receiver has no issue receiving and performing data demodulation but for RTT the induced DC phase jump can be problematic for some implementations. So, it’s better to limit the operation to only a ‘common 160MHz’ mode otherwise peers would have o use <80MHz BW for NDP transmissions. Suggestion is to limit the definition of the values 3, 4 and 5 to be the only selected 160MHz in addition <80MHz support.

Table

Description automatically generated

**Resolution for CID 287875: TGaz editor modify/add the text below in page 77 line 31**

The field values’ of 3, 4 and 5 specifies the STA support for 160MHz operation as either 80+80, 160 two-LO or 160 single-LO respectively in addition to supporting 80, 40 and 20MHz bandwidths (e.g., field value of 5 does not mean the device supports all 160MHz options but rather 160MHz single LO).

**Resolution for CID 287875: TGaz editor add the text below in page 135 line 42 (new paragraph)**

Upon reception of IFTMR frame with BW And Format subfield value of 3, 4 or 5 representing the ISTA’s support for one of the 160MHz BW options, the RSTA shall respond with the same requested value of BW And Format subfield in the IFTM frame if it supports the requested 160MHz BW option, otherwise respond with value less than 3.

Discussion for CID 287872 and CID 287874.

The commentor is pointing out that when ISTA negotiates to deliver I2R LMR in the Secure LTF operation (NTB or TB), it would need to send Secure LTF parameter element to provide the measurement SAC value corresponding to the measurement result and in addition to conveying LTF offset in the TB case as it can be used for additional authentication feedback,

**Resolution for CID 287874: TGaz editor modify the text below in page 175 line 29**

An RSTA transmitting an LMR frame or an ISTA when negotiated to transmit LMR frame, containing range measurement results measured from an I2R NDP and a R2I NDP, shall include the Secure LTF Parameters element in the protected LMR frame and set the Measurement SAC subfield in the Secure LTF Parameters element in the protected LMR frame to the same value as in the SAC subfield in the STA Info field with AID equal to 2043 in the Ranging NDP Announcement frame that solicited the I2R NDP and the R2I NDP.

Discussion for CID 287873

The commentor is pointing out that the spec still mentions that ISTA would need to use the Validation SAC to generate the *ista-ltf-key* and *ltf-iv* values as it was expected in the previous version of the specs however with the new version the Validation SAC in no longer needed.

**Resolution for CID 287873: TGaz editor change the text in page 174 line 19 as shown below:**

Or the ista-ltf-key and ltf-iv for generating secure HE-LTF based on (#1830, #1832) the values of the Secure LTF Counter (#2289) in the Secure LTF Parameters element in the last protected IFTM frame or last protected LMR frame, received from the RSTA; see 11.21.6.4.5.4 (Secure LTF octet stream generation). (#3123)

Discussion for CID 287872:

When an I2R LMR is negotiated then similar to the R2I LMR case, the ISTA needs to include the associated secure LTF parameters such that the measurement values correspond to the parameters used to estimate them.

**Resolution for CID 287872: TGaz editor change the text in page 170 line 28 as shown below:**

When an LMR frame contains range measurement results measured from an I2R NDP and a R2I NDP, an RSTA that transmits the R2I LMR frame or when negotiated, an ISTA that transmits an LMR frame, shall include the Secure LTF Parameters element in the protected LMR frame.

Discussion for CID 287871:

The commentor is pointing out that the spec still mentions that ISTA would need to use the Validation SAC to generate the *ista-ltf-key* and *ltf-iv* values as it was expected in the previous version of the specs however with the new version the Validation SAC in no longer needed.

**Resolution for CID 287871: TGaz editor change the text in page 169 line 35 as shown below:**

Send an HE TB Ranging NDP with the TXVECTOR parameters LTF\_KEY and LTF\_IV that are set to ista-ltf-key and ltf-iv for generating the secure HE-LTF based on (#1830, #1832) the value of the Secure LTF Counter subfield (#2289), in the Secure LTF Parameters element in the last protected IFTM frame, or last protected LMR frame, received from the RSTA; see 11.21.6.4.5.4 (Secure LTF octet stream generation);

Discussion for CID 287870

The commentor is pointing out that NDPA sent to a single user might have more than one STA Info as in the NTB case ISTA can include STA-info for conveying the SAC value as well as the need for TX power control. It is better to refine the spec so that it is for one STA-Info containing AID less than 2008.

Discussion for CID 287866

The commentor is pointing out that in TB Secure LTF case it is better to limit the UL sounding to a single user. The main reason is that Secure LTF waveform for MU-MIMO operation enabling AP reception can benefit from construction of P-Matrix where it won’t be available since phases of subcarriers for Secure LTF are randomly chosen in order to provide the feature of Secure LTF operation. Although the AP reception can be a differentiating feature so a vender can choose to implement and exploit the UL MU-MIMO operation but the lack of such capability during the negotiation step leaves ISTA in the mercy of the AP’s procedure which could impact the expected RTT performance. As such it’s better to limit the UL MU-MIMO capability for Secure LTF operation similar to what is currently in the spec for the Passive TB ranging operation

Discussion for CID 287867

The commentor is pointing out that in both NTB & TB sequence the protocol mandates the use of A-MPDU aggregation when RSTA is intending to transmit R2I LMR together with FTM termination frame. However, the ‘minimum start spacing parameter’ included in the A-MPDU parameters subfield (see table 9-282 in the baseline spec for reference) is not known/negotiated as part of the IFTMR/IFTM exchange for unassociated STAs. The commentor furthermore suggests to not include the parameter as part of the negotiation step as it adds complexity that otherwise needed and instead choose the value ‘no restriction’ for the unassociated ISTA.

Table

Description automatically generated

**Resolution for CID 287867: TGaz editor change clause 10.12.3 Mimimum MPDU Start Spacing Rules as follows (NOTE: need to import the relevant clause from 802.11ax D8.0)**

10.12.3 Minimum MPDU Start Spacing rules

If necessary, in order to satisfy this requirement, a STA shall add padding between MPDUs in an A-MPDU.

Any such padding shall be in the form of one or more MPDU delimiters with the MPDU Length field set to 0.

QoS Null frames transmitted by DMG STAs are not subject to this spacing, i.e., no MPDU delimiters with zero

length need to be inserted after the MPDU immediately preceding the QoS Null frame in an A-MPDU.

For FTM procedure measurement exchange in the unassociated mode, the transmitting STA may assume any of the values specified in table 9-222 (Subfields of the A-MPDU Parameters field), for the tMMSS.

**References:**

**[1] Draft P802.11az\_D4.0**

**[2] Draft P802.11REVme\_D1.0**