IEEE P802.11
Wireless LANs

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| LB279 Comment Resolution |
| Date: 2024-01-08 |
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Abstract

This submission proposes to address CID 1163, changes are relative to Draft P802.11be\_D4.0, Draft P802.11REVme\_D4.2, and Draft P802.11bk D1.0.

Revisions:

1. Changes during presentation, address RSTA Assigned R2I/I2R Rep = 320 MHz mentions
2. Additional changes during second presentation; rename fields to change “= 320 MHz”, add LTF total to Non-TB Measurement section

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbk Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbk Editor: Editing instructions preceded by “TGbk Editor” are instructions to the TGbk editor to modify existing material in the TGaz draft. As a result of adopting the changes, the TGbk editor will execute the instructions rather than copy them to the TGbk Draft.***

**The text preceded by “Discussion” is not part of the adopted changes.**

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| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| **1163** | 24.19 | 9.4 | "For 320MHz max R2I and max I2R Nss fields are added for 320MHz. Fields other than Nsts may be requiredPlease review and add other fields" | as in comment | **Revised**TGbk editor, make the changes identified in document<https://mentor.ieee.org/802.11/dcn/24/11-24-0271-01-00bk-lb279-comment-resolution-cid-1163.docx> |
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1. ***Discussion:***
2. Due to the large memory required to process 320 MHz LTFs, propose to add separate constraints on LTF-Repetitions and Total LTF for 320 MHz.
	* + - 1. 9.4.2.298 Ranging Parameters element
3. ***TGbk Editor: Change Figure 9-788en and Editor Instructions (p.22 in 11bk D1.0) as follows:***

***Change the Max R2I STS > 80 MHz and Max I2R STS > 80 MHz subfields in Figure* 9-788en *as follows.***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B1 | B2 B6 | B7 | B8 B9 | B10 B11 | B12 |  B13 | B14 |  B15 |
|  | StatusIndication | Value | I2R LMR Feedback | Reserved | RangingPriority | R2I TOA Type | I2R TOA Type | R2I AOA Request | I2R AOA Request |
| Bits: | 2 | 5 | 1 | 2 | 2 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B16 B21 | B22  | B23 | B24 B26 | B27 B29 | B30 B31 | B32 B34 | B35 B37 |
|  | Formatand Bandwidth | Immediate R2IFeedback | Immediate I2RFeedback | Max I2R Repetition | Max R2I Repetition | Reserved | Max R2ISTS ≤ 80 MHz | 160 MHz Max R2ISTS ~~> 80~~ ~~MHz~~ |
| Bits: | 6 | 1 | 1 | 3 | 3 | 2 | 3 | 3 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B38 B39  | B40 B41 | B42 B44 | B45 B47 | B48 B55 |
|  | Max R2I LTF Total | Max I2R LTF Total | Max I2RSTS ≤ 80 MHz | 160 MHz Max I2RSTS ~~> 80 MHz~~ | BSS ColorInformation |
| Bits: | 2 | 2 | 3 | 3 | 8 |

1. Figure 9-788en—Ranging Parameters field format
2. ***TGbk Editor: Change clause 9.4.298 (p.24 in 11bk D1.0) as follows:***

The format of the 320 MHz Ranging subelement is as shown in Figure [9-1001bba](file:///C%3A%5CUsers%5Cnxf57284%5CDocuments%5CIEEE%5CDraft%20P802.11bk_D1.0.docx#F09o1001bba) (320MHz Ranging subelement format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B15 | B16 B18 | B19 B21 | B22 | B23 | B24 B39 |
|  | Subelement ID | Length | Max R2I Nss  | Max I2R Nss  | Puncturing Pattern Support | Rsvd. | Puncturing Pattern |
| Bits: | 8 | 8 | 3 | 3 | 1 | 1 | 16 |
|  | B40 B42 | B43 B45 | B46 B47 | B48 B49 | B50 B55 |  |  |
|  | Max R2I Repetition | Max I2R Repetition | Max R2I LTF Total | Max I2R LTF Total | Rsvd. |  |  |
| Bits: | 3 | 3 | 2 | 2 | 6 |  |  |

1. Figure 9-1001bba —320 MHz Ranging subelement format

The Subelement ID and Length fields are defined in 9.4.3 (Subelements).

The Max R2I Nss field indicates the maximum number of spatial streams to be used in an R2I NDP for 320 MHz PPDU bandwidth transmission.

The Max I2R Nss field indicates the maximum number of spatial streams to be used in an I2R NDP for 320 MHz PPDU bandwidth transmission.

The Puncturing Pattern Support field is set to one to indicate support of all valid puncturing patterns as listed in Table 36-30 (Definition of the Punctured Channel Information field in the U-SIG for an EHT MU PPDU using non-OFDMA transmissions); it is set to zero to indicate support of only the subset of puncturing patterns defined in Table 11-14aa (Subset of puncturing patterns in 320MHz Ranging when Puncturing Pattern Support field set to 0).

The Puncturing Pattern field is used by the RSTA to convey the Disabled Subchannel Bitmap to the ISTA in the IFTM frame. It is reserved when included in the IFTMR frame by the ISTA.

The Max R2I Repetition field indicates the maximum number of LTF repetitions that the RSTA uses in the preamble of an R2I NDP for 320 MHz PPDU bandwidth transmission; the subfield is set to the number of LTF repetitions minus 1.

The Max I2R Repetition field indicates the maximum number of LTF repetitions that the ISTA uses in the preamble of an I2R NDP for 320 MHz PPDU bandwidth transmission; the subfield is set to the number of LTF repetitions minus 1.

The Max R2I LTF Total and Max I2R LTF Total fields indicate the maximum number of EHT-LTFs to be destined to an ISTA in the R2I NDP and an RSTA in an I2R NDP respectively for 320 MHz PPDU bandwidth transmission. The encoding is given in Table [9-322h23fc](#T09o322h23fc) (Max R2I/I2R LTF Total subfields). The maximum number of EHT-LTFs limits the allowed combinations of number of spatial streams and LTF repetitions.

1. ***TGbk Editor: Change clause*** ***11.21.6.3.3 (p.26 in 11bk D1.0) as follows:***

***Change subclause 11.21.6.3.3 in paragraph 8 as follows. (#202308-01, #202311-02, #202311-08)***

When a Ranging Parameters element is included in the IFTMR frame, the ISTA shall indicate the following parameters in the Ranging Parameters field:

* … …
* Maximum number of space-time streams it is capable of receiving in the R2I NDP for 160 MHz bandwidth~~s greater than 80 MHz~~, in the 160 MHz Max R2I STS ~~> 80 MHz~~ subfield.
* Maximum number of space-time streams it is capable of transmitting in the I2R NDP for bandwidths less than or equal to 80 MHz, in the Max I2R STS ≤ 80 MHz subfield.
* Maximum number of space-time streams it is capable of transmitting in the I2R NDP for 160 MHz bandwidth~~s greater than 80 MHz~~, in the 160 MHz Max I2R STS ~~> 80MHz~~ subfield.
* … …

To request a 320 MHz FTM session, an ISTA shall include a 320 MHz Ranging subelement together with the Ranging Parameters element in the IFTMR frame and set the Format and Bandwidth subfield to a value of 5 or less. In the subelement:

* The Max R2I Nss field is set to the maximum number of spatial streams the ISTA is capable of receiving in the R2I NDP for 320 MHz bandwidth minus 1.
* The Max I2R Nss field is set to the maximum number of spatial streams the ISTA is capable of transmitting in the I2R NDP for 320 MHz bandwidth minus 1.
* The Puncturing Pattern Support field is set to 1 to indicate support of all puncturing patterns, or it is set to 0 to indicate support of only the subset of puncturing patterns defined in Table 11-14aa (Subset of puncturing patterns in 320 MHz Ranging when Puncturing Pattern Support field set to 0).
* Maximum number of LTF repetitions it is capable of receiving in the preamble of the R2I NDP for 320 MHz bandwidth, in the Max R2I Repetition field.
* Maximum number of LTF repetitions it is capable of transmitting in the preamble of the I2R NDP for 320 MHz bandwidth, in the Max I2R Repetition field.
* Maximum number of LTFs in total it is capable of receiving for 320 MHz bandwidth, including all repetitions, in the R2I NDP, in the Max R2I LTF Total field.
* Maximum number of LTFs in total it is capable of transmitting for 320 MHz bandwidth, including all repetitions, in the I2R NDP, in the Max I2R LTF Total field.

***TGbk Editor: Change clause 11.21.6.3.3 (p.26 in 11bk D1.0) as follows:***

***Change subclause 11.21.6.3.3 in paragraph 21 as follows. (#202308-01, #202311-02, #2023-08)***

When the negotiation is successful for TB ranging and non-TB ranging, the corresponding IFTM frame from the RSTA shall include a Ranging Parameters element with the parameters that defines the negotiated range measurement session. The RSTA shall indicate the following parameters in the Ranging Parameters field:

* In the Format and Bandwidth subfield, it assigns the maximum allowed bandwidth used during measurement exchanges (referred to as RSTA Assigned Max Bandwidth). This value shall not be greater than the value in the corresponding IFTMR frame. If the IFTMR included a 320 MHz Ranging subelement, the bandwidth may be assigned as 320 MHz regardless of the Format and Bandwidth subfield value in the IFTMR frame.
* … …
* In the 160 MHz Max R2I STS ~~> 80 MHz~~ subfield, either the maximum number of space-time streams it is capable of transmitting in the R2I NDP for 160 MHz bandwidth~~s greater than 80 MHz~~, or the value in the corresponding IFTMR frame, whichever is smaller (referred to as 160 MHz RSTA Assigned R2I STS ~~> 80 MHz~~).
* In the 160 MHz Max I2R STS ~~> 80 MHz~~ subfield, either the maximum number of space-time streams it is capable of receiving in the I2R NDP for 160 MHz bandwidth~~s greater than 80 MHz~~, or the value in the corresponding IFTMR frame, whichever is smaller (referred to as 160 MHz RSTA Assigned I2R STS ~~> 80 MHz~~).

If the Format and Bandwidth subfield in the IFTM frame is set to 8, the RSTA shall include a Ranging Parameters element with a 320MHz Ranging subelement. In the 320 MHz Ranging subelement:

* The Max R2I Nss field is set to either the maximum number of spatial streams it is capable of transmitting in the R2I NDP for 320 MHz bandwidth minus 1, or the value in the corresponding IFTMR frame, whichever is smaller (referred to as 320 MHz RSTA Assigned R2I Nss).
* The Max I2R Nss field is set to either the maximum number of spatial streams it is capable of receiving in the I2R NDP for 320 MHz bandwidth minus 1, or the value in the corresponding IFTMR frame, whichever is smaller (referred to as 320 MHz RSTA Assigned I2R Nss).
* The Puncturing Pattern Support field is set to 1 to indicate support of all puncturing patterns, or it is set to 0 to indicate support of only the subset of puncturing patterns defined in Table 11-14aa (Subset of puncturing patterns in 320 MHz Ranging when Puncturing Pattern Support field set to 0).
* If the RSTA has included the Disabled Subchannel Bitmap subfield in the EHT Operation element, the Puncturing Pattern field is set to the same value; otherwise the Puncturing Pattern field is set to 0xffff.
* In the Max R2I Repetition field, it assigns the maximum number of LTF repetitions in the preamble of the R2I NDP for this session (referred to as 320 MHz RSTA Assigned R2I Rep). This value shall not be greater than the value in the corresponding IFTMR frame.
* In the Max I2R Repetition field, it assigns the maximum number of LTF repetitions in the preamble of the I2R NDP for this session (referred to as 320 MHz RSTA Assigned I2R Rep). This value shall not be greater than the value in the corresponding IFTMR frame.
* In the Max R2I LTF Total field, either the maximum number of LTFs in total it is capable of transmitting to this ISTA, including LTF repetitions, in the R2I NDP, or the value in the corresponding IFTMR frame, whichever is smaller (referred to as 320 MHz RSTA Assigned R2I LTF Total).
* In the Max I2R LTF Total field, either the maximum number of LTFs in total it is capable of receiving, including LTF repetitions, in the I2R NDP, or the value in the corresponding IFTMR frame, whichever is smaller (referred to as 320 MHz RSTA Assigned I2R LTF Total).
1. ***TGbk Editor: Change clause 11.21.6.3.4 (p.123, third paragraph in 11az-2020) as follows:***
2. When an RSTA assigns a secure HE-LTF measurement exchange by including a Secure HE-LTF subelement in the Ranging Parameters element in its IFTM frame and setting the Secure HE-LTF Required subfield to 1, the RSTA shall set the *RSTA Assigned R2I Rep* to the Max R2I Repetition subfield value in the IFTMR frame which shall be greater than 0, and the RSTA shall set *RSTA Assigned I2R Rep* to a value greater than 0 and less than or equal to the Max I2R Repetition subfield value in the IFTMR frame, where the *RSTA Assigned R2I Rep* and *RSTA Assigned I2R Rep* specify the number of HE-LTF repetitions in the preamble of the R2I and I2R NDP for this session, respectively. Similarly, if the RSTA has included a 320 MHz Ranging subelement together with the Ranging Parameters element in the IFTMR frame, the RSTA shall set the 320 MHz RSTA Assigned R2I Rep and 320 MHz RSTA Assigned I2R Rep to values greater than 0.
3. ***TGbk Editor: Change clause 11.21.6.4.3.3 (p.34, l.24 in 11bkD1.0) as follows:***

The RSTA shall select a bandwidth value for the measurement sounding phase that is less than or equal to the RSTA Assigned Max Bandwidth of each of the ISTAs that are being allocated resources during this measurement instance. It may be different from the bandwidth used in the Polling phase, but shall adhere to the rules of multiple frame transmission in an EDCA TXOP; see 10.23.2.8 (Multiple frame transmission in an EDCA TXOP).

If the bandwidth selected is 320 MHz in a measurement sounding phase, the TF Ranging Sounding frame(s) in this measurement sounding phase shall solicit EHT TB Ranging NDPs. Otherwise, the TF Ranging Sounding frames(s) shall solicit HE TB Ranging NDPs.

The RSTA shall set the TXVECTOR parameter CH\_BANDWIDTH of the ~~Trigger frame~~TF Ranging Sounding to that same bandwidth and use the same value for the UL BW subfield of the Common Info field of said Trigger frame. When transmitting the Ranging NDP Announcement frame and R2I NDP, the RSTA shall set the TXVECTOR parameter CH\_BANDWIDTH to that same bandwidth.

In the TF Ranging Sounding, the RSTA shall set the SS Allocation subfield and the I2R Rep subfield of the User Info fields corresponding to each of the ISTAs triggered by the Trigger frame in the following way:

* The Number of Spatial Streams in each SS Allocation subfield shall not exceed the assigned value *~~RSTA Assigned I2R STS~~ ~~≤ 80 MHz~~* for the corresponding bandwidth, for each of the ISTA; i.e., if the ~~UL BW subfield in the Common Info field indicated a~~ bandwidth is less than or equal to 80 MHz, the RSTA Assigned I2R STS ≤ 80 MHz, if the bandwidth is 160 MHz, ~~and not exceed~~ the *160 MHz RSTA Assigned I2R STS ~~> 80 MHz~~* ~~for the corresponding ISTA otherwise~~, and if the bandwidth is 320 MHz, the 320 MHz RSTA Assigned I2R Nss.
* All the I2R Rep subfields in the User Info fields of the TF Ranging Sounding shall be set to the same value. This value indicates the number of LTF repetitions in the I2R NDP preamble and shall not exceed any of the *RSTA Assigned I2R Rep* corresponding to the ISTA triggered by this Trigger frame if the bandwidth is less than 320 MHz or the 320 MHz RSTA Assigned I2R Rep otherwise.
* The product of the number of LTF repetitions, indicated in each of the I2R Rep subfields of the User Info fields, and the number of HE-LTF symbols, indicated in the Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field, shall not exceed the *RSTA Assigned I2R LTF Total* for any of the ISTA triggered by this Trigger frame if the bandwidth is less than 320 MHz or the 320 MHz RSTA Assigned I2R LTF Total otherwise.
1. ***TGbk Editor: Change clause 11.21.6.4.3.3 (p.35, l.1 in 11bkD1.0) as follows:***

Similarly, in the Ranging NDP Announcement frame, the RSTA shall set the R2I NSTS subfield and R2I Rep subfield of the STA Info fields corresponding to each of the ISTAs, addressed by that frame in the following way

* The R2I NSTS subfield value shall not exceed the assigned value *~~RSTA assigned R2I~~* *~~STS ≤ 80 MHz~~* ~~for the corresponding~~ for each ISTA for the corresponding bandwidth; i.e., if the bandwidth value selected ~~TXVECTOR parameter CH\_BANDWIDTH~~ for this measurement sounding phase ~~Ranging NDP Announcement frame~~ is less than or equal to 80 MH, the RSTA Assigned R2I STS ≤ 80 MHz, if the bandwidth is equal to 160 MHz, the ~~and not exceed~~ *160 MHz RSTA assigned R2I STS ~~> 80 MHz~~* ~~for the corresponding ISTA otherwise~~, and if the bandwidth is equal to 320 MHz, the 320 MHz RSTA Assigned R2I Nss.
* The number of LTF repetitions in the R2I Rep subfield shall be set to a value not to exceed the assigned value *~~RSTA Assigned R2I Rep~~*~~,~~ for ~~the corresponding~~ each ISTA for the corresponding bandwidth; i.e., if the bandwidth is less than 320 MHz the RSTA Assigned R2I Rep, and the 320 MHz RSTA Assigned R2I Rep otherwise.
* The combination of the values of the R2I NSTS and the R2I Rep shall not lead to a total number of LTF that exceeds the assigned value for each corresponding ISTA; i.e., if the bandwidth is less than 320 MHz the *RSTA Assigned R2I LTF Total*, and the 320 MHz RSTA Assigned R2I LTF Total otherwise~~for each corresponding ISTA~~.
1. ***TGbk Editor: Change clause 11.21.6.4.4.2 (p.44, l.5 in 11bkD1.0) as follows:***
2. ~~If the bandwidth is less than or equal to 80 MHz, the~~ The ISTA shall set the I2R NSTS subfield and the R2I NSTS subfield in the STA Info field of the Ranging NDP Announcement frame each to a value not to exceed the the respective assigned values; i.e., the *RSTA assigned I2R* *STS ≤ 80 MHz* and *RSTA assigned R2I* *STS ≤ 80 MHz*, if the bandwidth is less than or equal to 80 MHz, if ~~respectively. If~~ the bandwidth is equal to 160 ~~greater than 80~~ MHz, ~~the ISTA shall set these same subfields to values not to exceed~~ the *160 MHz RSTA assigned I2R* *STS ~~> 80 MHz~~* and *160 MHz RSTA assigned R2I* *STS ~~> 80 MHz~~*, and if the bandwidth is 320 MHz, the 320 MHz RSTA assigned I2R Nss and 320 MHz RSTA assigned R2I Nss ~~respectively~~.
3. The ISTA shall set the I2R Rep subfield and R2I Rep subfield in the STA Info field of the Ranging NDP Announcement frame each to a value not to exceed the respective assigned values; i.e., if the bandwidth is less than 320 MHz the *RSTA assigned I2R rep* and *RSTA assigned R2I rep* ~~respectively~~, and the 320 MHz RSTA Assigned I2R Rep and 320 MHz RSTA Assigned R2I Rep otherwise. Furthermore, the total number of LTF in the I2R NDP and R2I NDP, based on the number of spatial streams and repetitions, shall not exceed the corresponding assigned values; i.e., if the bandwidth is less than or equal to 320 MHz the *RSTA assigned I2R LTF Total* and *RSTA assigned R2I LTF Total* and the 320 MHz RSTA Assigned I2R LTF Total and 320 MHz RSTA Assigned R2I LTF Total otherwise ~~respectively~~.
4. ***TGbk Editor: Change clause 11.21.6.4.5.2 (p.50, l.21 in 11bkD1.0) as follows:***
5. The RSTA shall set the I2R Rep subfield of the User Info field corresponding to the ISTA in the Secure Sounding Ranging Trigger frame equal to the assigned value of the *~~RSTA Assigned I2R Rep~~* corresponding bandwidth~~to the ISTA~~;i.e., ~~where the value of~~ the *RSTA Assigned I2R Rep*, if the bandwidth is less than or equal to 320 MHz and the 320 MHz RSTA Assigned I2R Rep otherwise ~~shall be greater than 0~~.
6. ***TGbk Editor: Change clause 11.21.6.4.5.2 (p.52, l.1 in 11bkD1.0) as follows:***
7. The RSTA shall set the R2I Rep subfield in each of the STA Info field in the Ranging NDP Announcement frame equal to the assigned value of the corresponding bandwidth; i.e., the *RSTA Assigned R2I Rep*, if the bandwidth is less than or equal to 320 MHz, and the 320 MHz RSTA Assigned R2I Rep otherwise ~~for each of the corresponding ISTAs, where all of the~~ *~~RSTA Assigned R2I Rep~~* ~~shall be greater than 0~~.
8. ***TGbk Editor: Change clause 11.21.6.4.5.3 (p.56, l.8 in 11bkD1.0) as follows:***

The ISTA shall set the I2R Rep subfield and R2I Rep subfield of the STA Info field in the Ranging NDP Announcement frame to the respective assigned values of the corresponding bandwidth; i.e., the ~~of~~ *RSTA Assigned I2R Rep* and the *RSTA Assigned R2I Rep* ~~respectively~~, if the bandwidth is less than or equal to 320 MHz, and the 320 MHz RSTA Assigned I2R Rep and 320 MHz RSTA Assigned R2I Rep otherwise ~~corresponding to the RSTA. Both values of the~~ *~~RSTA Assigned R2I Rep,~~* ~~and~~ *~~RSTA Assigned I2R Rep,~~* ~~shall be~~~~greater than 0~~.