IEEE P802.11  
Wireless LANs

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| LB240 comment and resolution for PHY Service Interface | | | | |
| Date: 2019-05-01 | | | | |
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Abstract

This document proposes comment resolutions to the following CIDs (12 CIDs) for TGaz D1.0:

1298 1299 1319 1371 2324 2353 2356 2357 2359 2360 2510 2518

Revisions:

* Rev 0: Initial version of the document. Use 11az D1.0 as baseline spec text.

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 TGaz Draft. This introduction is not part of the adopted material.

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

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 1298 | Assaf Kasher | 147.01 | "Indicate the number of space-time streams to receive in the following HE Ranging NDP or the following HE TB Ranging NDP.": TXVECTOR control the transmission of the PPDU and things that go in the header. If this field controls the reception of the next PPDU, it should go into the PHY-CONFIG interface, not the PHY-SERVICE interface | Remove the LTF\_N\_STS line from the PHY-SERVICE interface. | Revised.  LTF\_N\_STS field is needed in TXVECTOR but existing description is not accurate. Tx MAC indicate the number of LTF symbols per HE-LTF segment to the PHY. For secured Ranging NDP, one LTF\_N\_STS is needed for each user.  LTF\_N\_STS is not needed in RXVECTOR. “the number of space-time streams to receive in the following HE Ranging NDP or the following HE TB Ranging NDP.” is indicated in LTFVECTOR.  Also, this field does not exist in table 21-1. Change the “otherwise” part to not present.  There are many further problems with the PHY-SERVICE interface. Please see more discussions below in the discussion part.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 1298 in 11-19/0700r0 |
| 1299 | Assaf Kasher | 147.01 | "Indicate the number of repetitions of the HE-LTF symbols to receive in the following HE Ranging": TXVECTOR control the transmission of the PPDU and things that go in the header. If this field controls the reception of the next PPDU, it should go into the PHY-CONFIG interface, not the PHY-SERVICE interface | Remove the LTF\_REP line from the PHY-SERVICE interface or show how it contorl the transmission of the current PPDU. Same for LTF-OFFSET | Revised.  LTF\_REP is needed for MAC to indicate the number of HE-LTF segments to PHY in TXVECTOR.  This field is not used to control the reception of next PPDU which is function of the LTF\_REP field in LTFVECTOR.  LTF\_REP is not an accurate name, change to LTF\_SEG.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 1299 in 11-19/0700r0 |
| 1319 | Assaf Kasher | 147.01 | "HEz sounding" - replace with "TB sounding" | as in comment | Revised.  “HEz” here is in a redundant field in the TXVECTOR/RXVECTOR table. Removed this field.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 1319 in 11-19/0700r0 |
| 2324 | Song-Haur An | 147.00 | How to use LTF\_SEQUENCE appearing twice in the same table? | Please clarify or consolidate them. | Revised.  There is a redundant LTF\_SEQUENCE field in the table. Removed one of them.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 2324 in 11-19/0700r0 |
| 2353 | Tianyu Wu | 147.01 | There are duplicate fields of LTF\_SEQUENCE in TXVECTOR and RXVECTOR parameters table. | Remove the first field of LTF\_SEQUENCE. | Accepted. |
| 2356 | Tianyu Wu | 147.01 | For all the "Otherwise" conditions, it's not clear what is the meaning of "See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).". There are no corresponding entry in Table 21-1 for many parameters in this table. | For the parameters not exist in table 21-1, change the value to "Not present". | Revised.  Agree in principle. Some of the “Otherwise” fields are removed, others change the value to “Not present.”  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 2356 in 11-19/0700r0 |
| 2357 | Tianyu Wu | 147.01 | Terms of LTF\_REP and "repetitions of the HE-LTF" are misleading. In secure HE-LTF, HE-LTFs are not repeated. | Change to more precise terms such as LTF\_SEC and sections of the HE-LTF. Clarify that for normal HE-LTF mode, the LTF sections are repeating but for secure HE-LTF mode, the LTF sections are defined with different randomized sequences. | Revised.  Agree in principle. Although for regular HE-LTFs, multiple segments of HE-LTF field for one user are repeating, this is not the case for secure HE-LTF. To be more precise, change all LTF\_REP to LTF\_SEG and do a global search to update the related part. Change “DL Rep” and “UL Rep” to “DL Seg” and “UL Seg” , change “repetition” to “segment” etc as listed in the text change part.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 2357 in 11-19/0700r0 |
| 2359 | Tianyu Wu | 148.01 | "NUM\_USERS" field definition is not correct.The value of this field should be defined as indicating the number of users in HE Ranging NDP with randomized LTF sequence. | Correct the definition of this field. | Revised.  Agree in principle. This field only presents for HE ranging NDP with secure HE-LTF.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 2359 in 11-19/0700r0 |
| 2360 | Tianyu Wu | 149.07 | All the parameters in LTFVECTOR are also defined in TXVECTOR and RXVECTOR, why need these duplicate parameters to be defined in TXVECTOR and RXVECTOR? The parameters in LTFVECTOR will not pass from MAC to PHY in Tx and not pass from PHY to MAC in Rx. They donot need to be defined in TXVECTOR and RXVECTOR. | Remove the redundant parameters from TXVECTOR/RXVECTOR table. | Revised.  TXVECTOR defines parameters that MAC indicates PHY for Ranging NDP/TB NDP transmission.  LTFVECTOR defines parameters that MAC indicates PHY to receive the expected Ranging NDP/TB NDP.  Most of fields are not needed in RXVECTOR since MAC already knows the parameters from NDPA/Ranging Trigger frame.  Some parameters in TXVECTOR/RXVECTOR are still redundant. Some fields in TXVECTOR/RXVECTOR/LTFVECTOR need modification.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 2360 in 11-19/0700r0 |
| 2510 | Youhan Kim | 147.01 | LTF\_SEQUENCE is defined twice in TXVECTOR. | Fix it. | Revised.  See resolution for CID 2324. |
| 2518 | Youhan Kim | 147.01 | What does HEz stand for? | All other PHY acronyms have a meaning. E.g. High Efficiency, Very High Throughput, High Throughput, High Rate, Extended Rate, Directional Multi-Gigabit, etc. Move out edits from Clause 28 to a different Clause, and come up with a more meaningful acronym than HEz for that clause. | Revised.  Agree in principle. “HEz” is an old acronym for 11az Ranging NDP. Should be changed to HE Ranging NDP PPDU.  In this table, since “HEz” is in a redundant field, removed this field.  **TGaz Editor:** Please make changes to IEEE P802.11az D1.0 according to the proposed text changes as resolution to CID 2518 in 11-19/0700r0 |

***Discussions:***

It will be clearer to define separate format for HE Ranging NDP and HE TB Ranging NDP PPDU. The reason is almost all fields in TXVECTOR/RXVECTOR do not apply to other HE PPDU formats.

For example, “LTF\_N\_STS” the condition is “HE\_SU or HE\_TB and APEP\_LENGTH is 0”. However, there is no need for regular HE NDP (HE\_SU with APEP\_LENGTH is 0) to define this field also there is no need for regular HE TB PPDU that only send EOF MPDU delimiters (APEP\_LENGTH is 0) to define this field.

Also, using “HE\_SU or HE\_TB and APEP\_LENGTH is 0” to signal HE Ranging NDP and HE TB Ranging NDP PPDU is sometimes not correct as shown in the example above. HE TB PPDU with APEP\_LENGTH = 0 may not be HE TB Ranging NDP.

Most of the fields are not needed in RXVECTOR because MAC already knows the parameters from received Ranging NDPA or Ranging Trigger frame.

A lot of fields are not needed for HE Ranging NDP and HE TB Ranging NDP PPDU. A few fields are missing in the table such as CH\_BANDWIDTH and GI\_TYPE etc.

LTF\_REP is not accurate since in secure HE-LTF field, the HE-LTFs are not repetitions. Change to LTF\_SEG and add definition for HE-LTF segments. In D1.0, LTF\_REP definition in TXVECTOR and LTFVECTOR is different. Propose to make the definitions consistent. Also, in D1.0, many places are using LTF\_REP as number of HE\_LTF repetitions, however, LTF\_REP is defined as number of repetitions -1. Change LTF\_REP to N\_SEG in these places.

LTF\_OFFSET only need in LTFVECTOR and only for Secured Ranging NDP PPDU. Other cases there will be no per user LTFs. It is not need in TXVECTOR because when a STA send the secured Ranging NDP PPDU, it needs to send the HE-LTFs for each user one by one.

***TGaz Editor: Change the text in P147L1 as follows:***

**Table ~~28~~xx-1—TXVECTOR and RXVECTOR parameters (#2360)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| FORMAT |  | Determines the format of the PPDU. Enumerated type:  NON\_HT indicates Clause 15, Clause 16, Clause 17, Clause 18 or non-HT duplicate PPDU format. In this case, the modulation is determined by the NON\_HT\_MODULATION parameter. HT\_MF indicates HT-mixed format. HT\_GF indicates HT-greenfield format. VHT indicates VHT format. HE\_SU indicates HE SU PPDU format. HE\_MU indicates HE MU PPDU format. HE\_ER\_SU indicates HE ER SU PPDU format. HE\_TB indicates HE TB PPDU format.  HE\_RANGING indicates HE Ranging NDP PPDU format.  HE\_TB\_RANGING indicates HE TB Ranging NDP PPDU format. | Y | N |
| CH\_BANDWIDTH | FORMAT is HE\_RANGING or HE\_TB\_RANGING | Indicates the channel width of the PPDU.  Enumerated type:  CBW20 for 20 MHz  CBW40 for 40 MHz  CBW80 for 80 MHz  CBW160 for 160 MHz  CBW80+80 for 80+80 MHz | Y | Y |
| GI\_TYPE | FORMAT is HE\_RANGING | Indicates the length of the GI for the HE-LTF fields. Enumerated type:  0u8s\_GI indicates 0.8 μs  1u6s\_GI indicates 1.6 μs  NOTE—the length of GI for pre-HE modulated fields is 0.8 μs. | Y | Y |
| FORMAT is HE\_TB\_RANGING | Not present. | N | N |
| UPLINK\_FLAG | FORMAT is HE\_RANGING | Set to 1 if the PPDU is addressed to an RSTA  Set to 0 otherwise. | Y | Y |
| FORMAT is HE\_TB\_RANGING | Not present. | N | N |
| BSS\_COLOR | FORMAT is HE\_RANGING or HE\_TB\_RANGING | Set to a value in the range 0 to 63 (see 11.22.6.4.5 (Transmission of a ranging NDP)). | Y | Y |
| TXOP\_DURATION | FORMAT is HE\_RANGING or HE\_TB\_RANGING | Provide the duration of TXOP. (see 11.22.6.4.5 (Transmission of a ranging NDP)) for details. | Y | Y |
| STARTING\_STS\_NUM | FORMAT is HE\_TB\_RANGING | Set to the starting spatial stream number minus 1 (spatial streams are globally numbered starting from 1) | Y | N |
| FORMAT is HE\_RANGING | Not present. | N | N |
| ~~LTF\_SEQUENCE~~  (#2324, #2353, #1319, #2518) | ~~FORMAT is either HE\_SU or HE\_TB and APEP\_LENGTH is 0~~ | ~~Indicates the LTF sequence generation information to make the randomized LTF sequence used in the HEz sounding NDP PPDU.~~  ~~The LTF sequence generation information is defined in 9.4.2.251 (Secure LTF Parameters).~~ | ~~O~~ | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | |
| ~~LTF\_OFFSET~~ | ~~FORMAT is HE\_SU and APEP\_LENGTH is 0~~  ~~FORMAT is HE\_RANGING and LTF\_SEQUENCE field presents~~ | ~~Indicates the number of HE-LTF to skip to receive in the following HE Ranging NDP.~~  ~~Set to a value in the range 0 to 63.~~ | ~~O~~ | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | |
| LTF\_N\_STS | ~~FORMAT is either HE\_SU or HE\_TB and APEP\_LENGTH is 0~~  FORMAT is HE\_RANGING and LTF\_SEQUENCE is present | ~~Indicate the number of space-time streams to receive in the following HE Ranging NDP or the following HE TB Ranging NDP .~~  ~~Set to the number of space-time streams minus 1.~~  Indicates the number of OFDM symbols in one segment of HE-LTF field for each user.  Integer in the range 1-8. (#1298) | ~~O~~  MU | N |
| FORMAT is HE\_RANGING and LTF\_SEQUENCE is not present or  FORMAT is HE\_TB\_RANGING | Indicates the number of OFDM symbols in one segment of HE-LTF field.  Integer in the range 1-8. (#1298) | Y | N |
| Otherwise | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~  Not present. | N | N |
| ~~LTF\_REP~~  LTF\_SEG  (#1299, #2357) | ~~FORMAT is either HE\_SU or HE\_TB and APEP\_LENGTH is 0~~  FORMAT is HE\_RANGING and LTF\_SEQUENCE is present | Indicate the number of ~~repetitions~~ segments of the HE-LTF ~~symbols~~ field for each user. ~~to receive in the following HE Ranging NDP or the following HE TB Ranging NDP.~~  Set to the number of ~~repetitions~~ segments minus 1. | ~~O~~  MU | N |
| FORMAT is HE\_RANGING and LTF\_SEQUENCE is not present or  FORMAT is HE\_TB\_RANGING | Indicate the number of segments of the HE-LTF field.  Set to the number of segments minus 1. | Y | N |
| Otherwise | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~  Not present. (#2356) | N | N |
| LTF\_SEQUENCE | ~~FORMAT is either HE\_SU or HE\_TB and APEP\_LENGTH is 0~~  FORMAT is HE\_RANGING and LTF\_SEQUENCE is present | Indicates the LTF sequence generation information for each user to generate the randomized LTF sequence used in the HE Ranging NDP ~~and HE TB Ranging NDP~~.  The LTF sequence generation information is defined in 9.4.2.251 (Secure LTF Parameters). | ~~O~~  MU | N |
| FORMAT is HE\_RANGING and LTF\_SEQUENCE is not present or  FORMAT is HE\_TB\_RANGING | Indicates the LTF sequence generation information to generate the randomized LTF sequence used in the HE Ranging NDP and HE TB Ranging NDP.  The LTF sequence generation information is defined in 9.4.2.251 (Secure LTF Parameters). | Y | N |
| Otherwise | Not present | N | N |
| ~~APEP\_LENGTH~~ | ~~FORMAT is HE\_SU or HE\_ER\_SU~~ | ~~Integer~~  ~~If 0 and FORMAT is HE\_SU, indicates an HE sounding NDP or HE Ranging NDP. If 0 and FORMAT is HE\_TB, indicates HE TB Ranging NDP.~~  ~~Otherwise, indicates the number of octets in the range 1 to aPSDUMaxLength in the A-MPDU pre-EOF padding (see Table 28-51 (HE PHY characteristics)) that is carried in the PSDU.~~ | ~~Y~~ | ~~N~~ |
| ~~FORMAT is HE\_MU or HE\_TB~~ | ~~MU~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (RXVECTOR and RXVECTOR parameters) and Table 21-1 (RXVECTOR and RXVECTOR parameters).~~ | | |
| ~~PSDU\_LENGTH~~ | ~~FORMAT is HE\_SU, HE\_MU, HE\_ER, HE\_ER\_SU or HE\_TB~~ | ~~Indicates the number of octets in the PSDU in the range of 0 to aPDUMaxLength octets (see Table 28-51 (HE PHY characteristics)). A value of 0 indicates and HE NDP, HE Ranging NDP or HE TB Ranging NDP.~~ | ~~N~~ | ~~Y~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (RXVECTOR and RXVECTOR parameters).~~ | | |
| ~~NUM\_STS~~ | ~~FORMAT is HE\_SU~~ | ~~Indicates the number of space-time streams. Interger in the range 1-8.~~ | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is HE\_ER\_SU~~ | ~~Indicates the number of space-time streams. Interger in the range 1-2.~~ |  |  |
| ~~FORMAT is HE\_MU~~ | ~~Indicates the number o space-time streams. Integer in the range: 1-4 per user per MU-MIMO RU in the TXVECTOR 1-4 per MU-MIMO RU in the RXVECTOR~~  ~~1-8 per RU assigned to no more than 1 user in the TXVECTOR and RXVECTOR~~  ~~NUM\_STS summed over all users perRU is not greater than 8.~~ | ~~MU~~ | ~~Y~~ |
| ~~FORMAT is HE\_TB~~ | ~~Indicates the number of space-time streams. Integer in the range: 1-4 for a MU-MIMO RU in the TXVECTOR 1-4 per user per MU-MIMO RU in the RXVECTOR~~  ~~1-8 for an RU assigned to no more than 1 user in the TXVECTOR and RXVECTOR~~  ~~NUM\_STS summed over all users per RU is not greater than 8~~ | ~~MU~~ | ~~MU~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (RXVECTOR and RXVECTOR parameters).~~ | | |
| NUM\_USERS | ~~FORMAT is HE\_SU, APEP\_LENGTH is 0, and LTF\_SEQUENCE is present~~  FORMAT is HE\_RANGING and LTF\_SEQUENCE is present | Indicating the number of target ISTAs of an HE Ranging NDP with randomized LTF sequence.  If NUM\_USERS is larger than 1, ~~NUM\_STS~~ LTF\_N\_STS, ~~LTF\_REP~~ LTF\_SEG, and LTF\_SEQUENCE will be MU type. | O | N |
| Otherwise | Not present | N | N |
| ~~FORMAT is HE\_SU, HE\_MU, HE\_ER, HE\_ER\_SU or HE\_TB~~ | ~~Not present.~~  ~~NOTE-number of users for an HE SU PPDU, HE ER SU PPDU or HE TB PPDU is otherwise 1. The number of users for an HE MU PPDU is determined by RU\_ALLOCATION.~~ | ~~N~~ | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (RXVECTOR and RXVECTOR parameters).~~ | | |
| ~~PSDU\_LENGTH~~ | ~~FORMAT is HE\_SU, HE\_MU, HE\_ER, HE\_ER\_SU or HE\_TB~~ | ~~Indicates the number of octets in the PSDU in the range of 0 to aPDUMaxLength octets (see Table 28-51 (HE PHY characteristics)). A value of 0 indicates and HE sounding NDP, HE Ranging NDP or HE TB Ranging NDP.~~ | ~~N~~ | ~~Y~~ |
|  | ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (RXVECTOR and RXVECTOR parameters).~~ | | |
| Note: In the “TXVECTOR” and “RXVECTOR” columns, MU indicates that the parameter is present per user. Parameters specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to NUM\_USERS − 1. | | | | |

***TGaz Editor: Change the text in P105L17 as follows:***

* + - * 1. **Transmission of a ranging NDP**

A RSTA transmitting an HE Ranging NDP PPDU to one or more peer ISTAs shall set the TXVECTOR parameter as follows:

* The FORMAT parameter is set to ~~HE\_SU~~ HE\_RANGING
* The UPLINK\_FLAG parameter is set to 0
* ~~The APEP\_LENGTH parameter is set to 0~~
* The NUM\_USER parameter is set to the number of ISTAs that the HE Ranging NDP PPDU is transmitted to.
* The ~~NUM\_STS~~ LTF\_N\_STS parameter is set as follows:
  + In the non-secure variant of the TB ranging measurement exchange, set to the same value as the DL N\_STS field in the STA Info field in the preceding Ranging NDP Announcement frame.
  + In the secure variant of the TB ranging measurement exchange,
    - The ~~NUM\_STS~~ LTF\_N\_STS [*p*] is set to the same value as the DL N\_STS field in the STA Info field addressed to the corresponding STA *p* in the preceding Ranging NDP Announcement frame when the HE Ranging NPD PPDU is transmitted to more than one ISTAs.
    - The ~~NUM\_STS~~ LTF\_N\_STS is set to the same value as the DL N\_STS field in the first STA Info field in the preceding Ranging NDP Announcement frame when the HE Ranging NPD PPDU is transmitted to one ISTA.
  + In the non-secure variant and secured variant non-TB ranging measurement exchange, set to the same value as the DL N\_STS field in the STA Info field in the preceding Ranging NDP Announcement frame.
* The ~~LTF\_REP~~ LTF\_SEG parameter is set as follows:
  + In the non-secure variant of the TB ranging measurement exchange, set to the same value as the DL ~~Rep~~ Seg field in the STA Info field in the preceding Ranging NDP Announcement frame.
  + In the secure variant of the TB ranging measurement exchange,
    - The ~~LTF\_REP~~ LTF\_SEG [*p*] is set to the same value as the DL ~~Rep~~ Seg field in the STA Info field addressed to the corresponding STA *p* in the preceding Ranging NDP Announcement frame when the HE Ranging NPD PPDU is transmitted to more than one ISTAs
    - The ~~LTF\_REP~~ LTF\_SEG is set to the same value as the DL ~~Rep~~ Seg field in the first STA Info field in the preceding Ranging NDP Announcement frame when the HE Ranging NPD PPDU is transmitted to one ISTA.
  + In the non-secure variant and secured variant non-TB ranging measurement exchange, set to the same value as the DL ~~Rep~~ Seg subfield in the STA Info field in preceding Ranging NDP Announcement frame.
* The CH\_BANDWIDTH parameter is set as follows:
  + In the non-secure variant and secured variant TB ranging measurement exchange, set to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the preceding Ranging Sounding Trigger frame
  + In the non-secure variant and secured variant non-TB ranging measurement exchange, set to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the preceding Ranging NDP Announcement frame
* In the secure variant non-TB and TB ranging measurement exchange, the LTF\_SEQUENCE parameter is set to as defined in 11.22.6.4.6.1 (Secure non-TB Ranging mode) and 11.22.6.4.6.2 (Secure TB Ranging mode). Otherwise, the LTF\_SEQUENCE parameter is not present.
* In the secure variant TB ranging measurement exchange, the LTF\_OFFSET parameter is set to as defined in 11.22.6.4.6.2 (Secure TB Ranging mode). Otherwise, the LTF\_OFFSET parameter is not present.
* ~~The HE\_LTF\_TYPE parameter is set to 2xHE-LTF~~
* The GI\_TYPE parameter is set to either 0u8s\_GI or 1u6s\_GI
* ~~The SPATIAL\_REUSE parameter is set to SRP\_AND\_NON-SRG\_OBSS- PD\_PROHIBITED~~
* The BSS\_COLOR parameter is set to the value indicated in the BSS Color subfield of the HE Operation element transmitted by the RSTA
* The TXOP\_DURATION parameter is set to either 127 or a value defined in Equation (27-2), with replaced *D*HE\_NDPA by *D*Ranging\_NDPA which is the value of the Duration/ID field in the MAC header of the preceding Ranging NDP Announcement frame

An ISTA transmitting an HE Ranging NDP PPDU to a RSTA shall set the TXVECTOR parameter as follows:

* The FORMAT parameter is set to ~~HE\_SU~~ HE\_RANGING
* The UPLINK\_FLAG parameter is set to 1
* ~~The APEP\_LENGTH parameter is set to 0~~
* The ~~NUM\_STS~~ LTF\_N\_STS parameter is set to the same value as the UL N\_STS subfield in the STA Info field in the preceding Ranging NDP Announcement frame
* The ~~LTF\_REP~~ LTF\_SEG parameter is set to the same value as the UL ~~Rep~~ Seg subfield in the STA Info field in the preceding Ranging NDP Announcement frame
* The CH\_BANDWIDTH set to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the preceding Ranging NDP Announcement frame
* In the secure variant of the non-TB ranging measurement exchange, the LTF\_SEQUENCE parameter is set to as defined in 11.22.6.4.6.1 (Secure non-TB Ranging mode). Otherwise, the LTF\_SEQUENCE parameter is not present
* ~~The HE\_LTF\_TYPE parameter is set to 2xHE-LTF~~
* The GI\_TYPE parameter is set to either 0u8s\_GI or 1u6s\_GI
* ~~The SPATIAL\_REUSE parameter is set to SRP\_AND\_NON-SRG\_OBSS- PD\_PROHIBITED~~
* The BSS\_COLOR parameter is set to the value indicated in the BSS Color subfield of the HE Operation element received from the RSTA
* The TXOP\_DURATION parameter is set to either 127 or a value defined in Equation (27-2), with replaced *D*HE\_NDPA by *D*Ranging\_NDPA which is the value of the Duration/ID field in the MAC header of the preceding Ranging NDP Announcement frame

An ISTA transmitting an HE TB Ranging NDP PPDU to a RSTA shall set the TXVECTOR parameter as follows:

* The FORMAT parameter is set to ~~HE\_TB~~ HE\_TB\_RANGING
* ~~The APEP\_LENGTH parameter is set to 0~~
* The ~~NUM\_STS~~ LTF\_N\_STS parameter is set to the same value as the Number Of Spatial Streams subfield in the SS Allocation field in the User Info field in the eliciting Ranging Sounding Trigger frame
* The ~~LTF\_REP~~ LTF\_SEG parameter is set to the same value as the UL ~~Rep~~ Seg subfield in the User Info field in the eliciting Ranging Sounding Trigger frame
* The STARTING\_STS\_NUM parameter is set to the starting spatial stream number minus 1. Spatial streams are globally numbered starting from 1.
* The CH\_BANDWIDTH parameter is set to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the eliciting Ranging Sounding Trigger frame
* In the secure variant of the TB ranging measurement exchange, the LTF\_SEQUENCE parameter is set to as defined in 11.22.6.4.6.2 (Secure TB Ranging mode). Otherwise, the LTF\_SEQUENCE parameter is not present
* ~~The HE\_LTF\_TYPE parameter is set to 2xHE-LTF~~
* ~~The GI\_TYPE parameter is set to 1u6s\_GI~~
* ~~The SPATIAL\_REUSE parameter is set to SRP\_AND\_NON-SRG\_OBSS- PD\_PROHIBITED~~
* The BSS\_COLOR parameter is set to the value indicated in the BSS Color subfield of the HE Operation element received from the RSTA
* The TXOP\_DURATION parameter is set as defined in 27.11.5 (TXOP\_DURATION)

***TGaz Editor: Change the text in P149L7 as follows:***

The LTFVECTOR is carried in a PHY-RXLTFSEQUENCE.request for PHY of STA to receive expected HE Ranging NDP and the HE TB Ranging NDP following NDP-A or Ranging Trigger frame. The parameters in Table 28-2a (LTFVECTOR parameters) are defined as part of the LTFVECTOR parameter list in the PHY-RXLTFSEQUENCE.request primitive.

***TGaz Editor: Change the text in P150L1 as follows:***

**Table ~~28~~xx-2a—LTFVECTOR parameters (#2360)**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| LTF\_SEQUENCE | Indicates the LTF sequence generation information ~~to make~~ for the randomized LTF sequence used in the ~~HEz sounding NDP PPDU~~ HE Ranging NDP and HE TB Ranging NDP.  The LTF sequence generation information is defined in 9.4.2.251 (Secure LTF Parameters). |
| LTF\_OFFSET | Indicates the number of HE-LTF to skip to receive in the ~~following~~ expected HE Ranging NDP. |
| LTF\_N\_STS | Indicate the number of ~~space-time streams~~ OFDM symbols of each segment of the HE-LTF field ~~to receive~~  in the ~~following~~ expected HE Ranging NDP or ~~the following~~ HE TB Ranging NDP. |
| ~~LTF\_REP~~  LTF\_SEG | Indicate the number of ~~repetitions~~ segments of the HE-LTF ~~symbols~~ field to receive in the ~~following~~ expected HE Ranging NDP or ~~the following~~ HE TB Ranging NDP.  Set to the number of segments minus 1. |

Add definition for HE-LTF segments:

***TGaz Editor: Change the text in P151L16 as follows:***

* HE-LTF field may include multiple HE-LTF segments. Within each HE-LTF segment, the number of HE-LTF symbols is the same and determined by the number of space-time streams N\_STS. (#2357)
  + For non-secure HE-LTFs, HE-LTF segments are repetition of each other and HE-LTF symbols in each segment are regular HE-LTFs defined as in Section 27.3.10.10 (HE-LTF). The number of segments, N\_SEG, can take the value from 1 to 8.
  + For secure HE-LTFs, HE-LTF field may include HE-LTF symbols for multiple target ISTAs. For each ISTA, HE-LTF symbols are different for different segments and defined as in xx.xx (Secure HE-LTF). The number of segments, N\_SEG, can take a value from 2 to 8.
* The TXVECTOR parameter ~~LTF\_REP~~ LTF\_SEG that indicates the number of ~~repetitions~~ segments of the HE-LTF symbols and TXVECTOR parameter LTF\_OFFSET that indicates the number of HE-LTF to skip to receive are not encoded in the HE-SIG-A. For decoding the HE-LTF fields, a PHY- RXLTFSEQUENCE.request primitive issued from the MAC provides the ~~LTF\_REP~~ LTF\_SEG parameter and LTF\_OFFSET parameter.

***TGaz Editor: Change the text in P153L8 as follows:***

* Can use regular HE-LTFs or Secure HE-LTFs with randomized LTF sequence (see Section ~~28.3.17d~~ xx.xx).
* HE-LTF field may include multiple HE-LTF segments. Within each HE-LTF segment, the number of HE-LTF symbols is the same and determined by the number of space-time streams N\_STS. (#2357)
  + For non-secure HE-LTFs, HE-LTF segments are repetition of each other and HE-LTF symbols in each segment are regular HE-LTFs defined as in Section 27.3.10.10 (HE-LTF). The number of segments can take the value from 1 to 8.
  + For secure HE-LTFs, HE-LTF symbols are different for different segments and defined as in xx.xx (Secure HE-LTF). The number of segments can take a value from 2 to 8.

List of LTF\_REP to LTF\_SEG related change for CID 2357:

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

***Global search and replace “Rep” by “Seg”***

***Global search and replace “LTF\_REP” by “LTF\_SEG”***

***Global search and replace “N\_REP” by “N\_SEG”***

***Global search and replace “repetition” by “segment”.***

***Global search and replace “repetitions” by “segments”.***

**References:**