IEEE P802.11  
Wireless LANs

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| LB259 Comment Resolution | | | | |
| Date: 2022-01-18 | | | | |
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|  |  |  |  |  |

Abstract

This submission discusses resolutions to the following 12 CIDs from WG LB 259 of TGbd D3.0.

The CID list is: 3001, 3002, 3012, 3017, 3018, 3051, 3052, 3061, 3063, 3064, 3077, 3103

Proposed changes in this document are with reference to TGbd D3.0.

Revisions:

* Rev 0: Intitial version of the document, CR of CID 3002 not included
* Rev 1: Update of CIDs 3001, 3018 after discussion during TGbd Telco
* Rev 2: Initial CR of CID 3002 and update on CR of CID 3052
* Rev 3: Initial CR of CID 3002 and update on CR of CID 305~~2~~1
* Rev 4: CID 3002, 3051: After discussion moved changes from subclause 9.3.1.19 to 31.4
* Rev 5: CID 3002, 3051: Revised based on e-mail discussion

Proposed comment resolution

Presented and discussed, no open discussion points

Under discussion

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 3061 | 19.31 | Change "higher" to "better" or "lower" to reflect the intended objective. | As in comment. | Rejected  As explained by the commenter of CID 2053 in LB254 of 11bd D2.0, “The number that represents the sensitivity is lower (more negative) but the sensitivty is higher (more sensitive).” Since “higher sensitivity” is technical more accurate than “better sensitivity”, the proposed change is rejected. |
| 3077 | 19.42 | Fairness is not a defined 802.11 term and does not seem to clearly define that an NGV STA will fairly contend with non-NGV STAs for the medium. | Replace "fairness" With: "fairness in contending for the medium" | Accepted |
| 3063 | 19.65 | Not clear about what "the same Channel" is meant. Does it mean the allocated DSRC spectrum or something else? Please clarify. | As in comment. | Rejected  The terms channel and channel spacing are defined in 802.11-2020 in Subclause 3.1. An NGV STA is using either a channel with 10 MHz or 20 MHz channel spacing and corresponding PPDU width. The possible channel allocations in the 5.9 GHz band are defined in Annex E.1 of 802.11-2020.  See also CID 3064 |
| 3064 | 20.14 | Not clear about what "the same Channel" is meant. Does it mean the allocated DSRC spectrum or something else? Please clarify. | As in comment. | Rejected  The terms channel and channel spacing are defined in 802.11-2020 in Subclause 3.1. An NGV STA is using either a channel with 10 MHz or 20 MHz channel spacing and corresponding PPDU width. The possible channel allocations in the 5.9 GHz band are defined in Annex E.1 of 802.11-2020.  See also CID 3063 |
| 3002 | 38.09 | In 9.3.1.19 the title now suggest there are 3 kinds of NDPA: VHT HE and NGV Ranging this is not correct because 11az has its own NDPA type of Ranging NDP and it is not NGV Ranging | Adjust the name to separate the NGV Ranging NDPA from the Ranging NDPA | Revised  Agree with comment.  Since subclause 9.3.1.19 has been significantly updated in 11az D4.0 an update to the changes on NGV Ranging NDPA and Ranging NDPA frame is provided.  **TGbd editor**:  Please change the subclause heading of 9.3.1.19 to “VHT/HE/Ranging NDP Announcement frame format” and incorporate the changes in <https://mentor.ieee.org/802.11/dcn/22/11-22-0007-05-00bd-lb259-comment-resolution.docx>  and  apply editorial modifications to fix unnecessary capitalization under CID 3056 in DCN [11-22/0016r2](https://mentor.ieee.org/802.11/dcn/22/11-22-0016-02-00bd-resolutions-to-editorial-comments-part-2.docx) |
| 3001 | 40.18 | The Format and BW is an ordered list, meaning support for a BW suggests support for lower BWs. The additions 11bd made break this rule. As a result the support during negotiation of the STA is unclear. | Insert text in the element description that clarifies that support for values 6 and 7 does is limited to NGV formats only. i.e. support for 7 suggests support for 6 but not to 5 and below. | Revised  Agree with comment.  **TGbd editor**:  Please add the following sentence after Table 9-322h23fb and add “\*” after NGV in the Format column:  \* Values 6 and 7 may only be supported when dot11NGVActivated is true. |
| 3012 | 40.22 | The last two columns in the last row of Table 9-322h23fb have not the same entries as in Table 9-322h23fb on P77 in 11az D4.0. | In the last row of Table 9-322h23fb change the FORMAT and Bandwidth value to "Reserved" as in 11az D4.0. | Accepted |
| 3051 | 66.39 | It is not clear which paragraph(s) indicates "the following differences". | Please apply any marking (such as indent) to the paragraph(s) that indicates "the following differences". | Revised  In principle agree with comment.  **TGbd editor**:  Please incorporate the changes in <https://mentor.ieee.org/802.11/dcn/22/11-22-0007-05-00bd-lb259-comment-resolution.docx> |
| 3052 | 67.08 | It is not clear which paragraph(s) indicates "the following rules". | Please apply any marking (such as indent) to the paragraph(s) that indicates "the following rules". | Revised  In principle agree with comment.  **TGbd editor**:  Please incorporate the changes in <https://mentor.ieee.org/802.11/dcn/22/11-22-0007-05-00bd-lb259-comment-resolution.docx> |
| 3017 | 122.49 | Table 32-11 defined NNGV-LTF newley in 11bd D3.0 compared to 11bd D2.0. Hence Figure 32-18 needs to be updated. | Remove the factor "(LTF\_REP+1)" above the brace of the NGV-LTF symbols | Accepted |
| 3103 | 123.01 | As NGV ranging NDP can only use "NGV-LTF-2x", so MCS 15 cannot be signaled in NGV-SIG for ranging NDP. We can either set some rules for NGV-SIG when transmitting ranging NDP or make NGV-MCS field reserved and set to a default value, like 0. | As in the comment. | Revised  In principle agree with comment.  **TGbd editor**:  Please add the following bullet to the end of the bullet list on P122L60:   * The TXVECTOR parameter NGV-MCS shall be set to 0. |
| 3018 | 123.26 | Table 32-11 defined NNGV-LTF newley in 11bd D3.0 compared to 11bd D2.0. Hence Figure 32-19 needs to be updated. | 1. Replace "NNGV-LTF" by "NSS" on L26 twice. 2. Remove the factor "(LTF\_REP+1)" after "NNGV-LTF" on L28. | Revised  **TGbd editor**:  Please incorporate the changes in <https://mentor.ieee.org/802.11/dcn/22/11-22-0007-05-00bd-lb259-comment-resolution.docx>  In addition to the proposed changes by the commentor, please change L6 “NUM\_SS” to “the TXVECTOR parameter NUM\_SS” |

Add text

~~Remove text~~

# CID3002

In 11bd, we have introduced an NGV Ranging NDP Announcement (NDPA) frame, but have not fully specified it. The goal of NGV Ranging in the 5.9 GHz band is to reuse as much as possible the non-TB ranging of 11az. There are two options:

* Fully specify an NGV Ranging NDPA and update all necessary references in 11bd with respect to 11az.
* Remove NGV Ranging NDPA and update references to Ranging NDPA where necessary to include changes from 11bd, e.g. references to HE Ranging NDPs need to be revised to include NGV Ranging NDPs.

11az contains 104 references to Ranging NDPA, 97 to HE Ranging NDP, 59 HE TB Ranging NDP (not relevant for 11bd), 306 to Ranging NDP (including the previous references).

11bd contains 5 references to NGV Ranging NDPA and 8 references to Ranging NDPA.

To conclude, implementing the second option for 11bd will mean less changes to 11bd D3.0.

According to 802.11 Style Guide [11-09/1034r19](https://mentor.ieee.org/802.11/dcn/09/11-09-1034-19-0000-802-11-editorial-style-guide.docx), Clause 9 is reserved for describing structure (apart from statements in 9.1). Hence, the changes proposed for CID3002 in 9.3.1.19 in <https://mentor.ieee.org/802.11/dcn/22/11-22-0007-03-00bd-lb259-comment-resolution.docx> are adapted and moved to 31.4 (NGV ranging) as they do not change the structure.

The following changes are with respect to 11az D4.0.

***Change the header of 9.3.1.19 as follows:***

**9.3.1.19 VHT/HE/~~(NGV)~~ Ranging NDP Announcement frame format**

***Insert the following paragraph at the end of subclause:***

~~When used as part of Non-TB Ranging measurement exchange in 11.21.6.4.4 (Non-TB Ranging measurement exchange), the I2R N\_STS and I2R Rep subfields are used to indicate the configuration of HE-LTF~~

~~and NGV-LTF of the following I2R NDPs. The R2I N\_STS and R2I Rep subfields indicate the configuration of HE-LTF and NGV-LTF of the R2I NDP sent in response by the RSTA. When a Ranging NDP~~

~~Announcement frame is configured for NGV ranging, the subfields of the STA Info field shall be set as follows:~~

~~— LTF Offset shall be set to zero.~~

~~— R2I N\_STS shall be set to the number of spatial streams of the R2I NDP.~~

~~— R2I Rep shall be set to 0 if the NGV-LTF in the R2I NDP is not repeated and shall be set to 1 if the NGV-LTF in the R2I NDP is repeated.~~

~~— I2R N\_STS shall be set to the number of spatial streams of the I2R NDP.~~

~~— I2R Rep shall be set to 0 if the NGV-LTF in the R2I NDP is not repeated and shall be set to 1 if the NGV-LTF in the R2I NDP is repeated.~~

An NGV STA may use the Ranging NDP Announcement frame format for non-TB ranging measurement exchange (11.21.6.4.4 (Non-TB ranging measurement exchange)), see 31.4 (NGV ranging).

**10.23.2.8 Multiple frame transmission in an EDCA TXOP**

***Add the last two bullets to the current bullet list as follows:***

— One of the following:

—A VHT NDP Announcement frame followed after SIFS by a VHT NDP followed after SIFS by an A-MPDU containing one or more VHT Compressed Beamforming frames.(11ax)

—A Beamforming Report Poll frame followed after SIFS by an A-MPDU containing one or more VHT Compressed Beamforming frames.

—An HE NDP Announcement frame followed after SIFS by an HE sounding NDP followed after SIFS by a PPDU containing one or more HE Compressed Beamforming/CQI frames.(11ax)

—A broadcast HE NDP Announcement frame followed after SIFS by an HE sounding NDP followed after SIFS by a BFRP Trigger frame followed by HE TB PPDUs.(11ax)

—A BFRP Trigger frame followed after SIFS by an HE TB PPDU containing one or more HE Compressed Beamforming/CQI frames.(11ax)

—A Ranging NDP Announcement frame followed after SIFS by an HE Ranging ~~10~~ NDP followed after SIFS by an HE Ranging NDP followed after SIFS by an ~~11~~ LMR frame.

—A~~n NGV~~ Ranging NDP Announcement frame followed after SIFS by an NGV NDP followed after SIFS by another NGV NDP followed after SIFS by an LMR frame.

—A~~n NGV~~ Ranging NDP Announcement frame followed after SIFS by an NGV NDP followed after SIFS by another NGV NDP followed after SIFS by an LMR frame followed after SIFS by another LMR frame.

***Change the first paragraph and the bullet list after the 10th paragraph of 11.21.6.4.4.2:***

**11.21.6.4.4.2 Measurement sounding phase of non-TB ranging**

An ISTA shall initiate a non-TB ranging measurement instance by transmitting a Ranging NDP Announcement frame addressed to the RSTA, followed by an I2R NDP SIFS after. In response to the correctly received Ranging NDP Announcement frame addressed to itself, the RSTA shall transmit an R2I NDP; see Figure 11-37i (Non-TB ranging measurement exchange sequence). I2R NDP and R2I NDP, refer to NGV Ranging NDPs when dot11NGVActivated is true and HE Ranging NDPs otherwise~~respectively~~. The measurement-reporting phase consists of an LMR frame, which is a Location Measurement Report as defined in 9.6.7.49 (Location Measurement Report (LMR) frame format).

Accordingly:

• An ISTA transmitting a Ranging NDP Announcement frame shall not use a bandwidth ~~32~~ wider than that indicated by an RSTA in the Ranging Parameters field, in the IFTM frame.

• An ISTA transmitting an I2R NDP shall set the TXVECTOR parameter CH\_BANDWIDTH to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the preceding Ranging NDP Announcement frame.

• An RSTA transmitting a R2I NDP shall set the TXVECTOR parameter CH\_BANDWIDTH to the bandwidth of the Ranging NDP Announcement frame and/or the I2R NDP; which are obtained from the RXVECTOR parameter CH\_BANDWIDTH of the Ranging NDP Announcement frame or I2R NDP respectively. For the Ranging NDP Announcement frame, when not received in an HE/VHT/HT/NGV PPDU: from the RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT when the Ranging NDP Announcement frame is received in a non-HT duplicate PPDU and is 20 MHz when the Ranging NDP Announcement frame is received in a non-HT PPDU.

**11.21.6.4.6 Transmission of a ranging NDP**

***Add the following new paragraphs at the end of the subclause:***

An RSTA transmitting an NGV Ranging NDP to an ISTA shall set the TXVECTOR parameters as follows:

— The FORMAT parameter is set to NGV.

— The CH\_BANDWIDTH parameter is set to the same value as the RXVECTOR parameter CH\_BANDWIDTH in the preceding I2R NDP frame.

— The NGV~~\_‑~~LTF~~\_‑~~TYPE parameter is set to 1 to indicate NGV\_LTF\_2X is used in the NGV Ranging NDP.

— The NUM\_SS parameter is set to the same value as the R2I NUM\_STS in the STA Info field in the preceding Ranging NDP Announcement frame.

— The APEP\_LENGTH parameter is set to 0.

— The PSDU\_LENGTH parameter is set to 0.

— The LTF\_REP parameter is set to the same value as the R2I LTF\_REP in the STA Info field in the preceding Ranging NDP Announcement frame.

An ISTA transmitting an NGV Ranging NDP to an RSTA shall set the TXVECTOR parameters as follows:

— The FORMAT parameter is set to NGV.

— The CH\_BANDWIDTH parameter is set to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the preceding Ranging NDP Announcement frame.

— The NGV~~\_‑~~LTF~~\_‑~~TYPE parameter is set to 1 to inidicate NGV\_LTF\_2X is used in the NGV Ranging NDP.

— The NUM\_SS parameter is set to the same value as the I2R NUM\_STS in the STA Info field in the preceding Ranging NDP Announcement frame.

— The APEP\_LENGTH parameter is set to 0.

— The PSDU\_LENGTH parameter is set to 0.

— The LTF\_REP parameter is set to the same value as the I2R LTF\_REP in the STA Info field in the preceding Ranging NDP Announcement frame.

**31.4 NGV ranging**

* For ranging in the 5.9 GHz band, a non-TB ranging measurement exchange is used by NGV STAs as defined in 11.21.6.4.4 (Non-TB Ranging measurement exchange) with the following changes:

• An NGV Ranging NDP is transmitted instead of an HE Ranging NDP.

• A~~n NGV~~ Ranging NDP Announcement frame (9.3.1.19 (VHT/HE/Ranging NDP Announcement frame format)) is transmitted ~~instead of a VHT/HE/Ranging NDP Announcement frame~~. The following differences in the subfields of the STA Info fields of the Ranging NDP Announcement frame apply compared to 9.3.1.19 (VHT/HE/Ranging NDP Announcement frame format):

* + LTF Offset is set to 0.
  + R2I N\_STS subfield is set to the number of spatial streams of the R2I NGV Ranging NDP minus 1.
  + R2I Rep subfield is set to 0 if the NGV-LTF in the R2I NGV Ranging NDP is not repeated and is set to 1 if the NGV-LTF in the R2I NGV Ranging NDP is repeated.
  + I2R N\_STS subfield is set to the number of spatial streams of the I2R NGV Ranging NDP minus 1.
  + I2R Rep subfield is set to 0 if the NGV-LTF in the I2R NGV Ranging NDP is not repeated and is set to 1 if the NGV-LTF in the I2R NGV Ranging NDP is repeated.
  + The I2R N\_STS and I2R Rep subfields are used to indicate the following I2R NGV Ranging NDP’s NGV-LTF configuration, 32.3.15 (NGV Ranging NDP), while the R2I N\_STS and R2I Rep subfields indicate the NGV-LTF configuration of the R2I NGV Ranging NDP sent in response by the RSTA, see 11.21.6.4.4 (Non-TB ranging measurement exchange).
  + When the TXVECTOR parameter CH\_BANDWIDTH is CBW10, the I2R NDP Tx Power subfield indicates the combined average power per 10 MHz bandwidth referenced to the antenna connector, of all antennas used to transmit the following I2R NDP.

# CID3051

The fine timing measurement procedure negotiation is performed by an NGV STAs as specified in 11.21.6.3 (Fine timing measurement procedure negotiation) with the following differences:

* For ranging in the 5.9 GHz band, in the Ranging Parameters element included in the IFTMR frame:  
  • Status indication field and value field is reserved.  
  • Secure LTF Req, Secure LTF Support is set to 0.  
  • Device Class field is reserved.  
  • Full BW UL MU-MIMO field is reserved.  
  • Max R2I STS > 80 MHz field is reserved.  
  • Max I2R STS > 80 MHz field is reserved.
* For ranging in the 5.9 GHz band, a non-TB ranging measurement exchange is used by NGV STAs as defined in 11.21.6.4.4 (Non-TB Ranging measurement exchange) with the following changes:

• An NGV Ranging NDP is transmitted instead of an HE Ranging NDP.

• A~~n NGV~~ Ranging NDP Announcement frame (9.3.1.19 (VHT/HE/Ranging NDP Announcement frame format)) is transmitted ~~instead of a VHT/HE/Ranging NDP Announcement frame~~. The following differences in the subfields of the STA Info fields of the Ranging NDP Announcement frame apply compared to 9.3.1.19 (VHT/HE/Ranging NDP Announcement frame format):

* + LTF Offset is set to 0.
  + R2I N\_STS subfield is set to the number of spatial streams of the R2I NGV Ranging NDP minus 1.
  + R2I Rep subfield is set to 0 if the NGV-LTF in the R2I NGV Ranging NDP is not repeated and is set to 1 if the NGV-LTF in the R2I NGV Ranging NDP is repeated.
  + I2R N\_STS subfield is set to the number of spatial streams of the I2R NGV Ranging NDP minus 1.
  + I2R Rep subfield is set to 0 if the NGV-LTF in the I2R NGV Ranging NDP is not repeated and is set to 1 if the NGV-LTF in the I2R NGV Ranging NDP is repeated.
  + The I2R N\_STS and I2R Rep subfields are used to indicate the following I2R NGV Ranging NDP’s NGV-LTF configuration, 32.3.15 (NGV Ranging NDP), while the R2I N\_STS and R2I Rep subfields indicate the NGV-LTF configuration of the R2I NGV Ranging NDP sent in response by the RSTA, see 11.21.6.4.4 (Non-TB ranging measurement exchange).
  + When the TXVECTOR parameter CH\_BANDWIDTH is CBW10, the I2R NDP Tx Power subfield indicates the combined average power per 10 MHz bandwidth referenced to the antenna connector, of all antennas used to transmit the following I2R NDP.

For ranging on IEEE Std 802.11 bands outside the 5.9 GHz band, whether PASN is required is indicated by the higher layers. Two STAs co-located with NGV STAs may establish PASN authentication if so indicated by the higher layer using the procedures as defined in 12.12 (Pre Association Security Negotiation) with the following change: the exchanges between ISTA and RSTA are done by two STAs each co-located with an NGV STA. Alternatively, the security association between the two STAs may be established by higher layer exchanges in the 5.9 GHz band.

# CID3052

When a member in radio environment request vector represents "selection within MAC sublayer," the NGV STA shall select the related member value by itself. Otherwise the following rules shall be applied:

* When transmitting an MPDU that encapsulates an MSDU, an NGV STA shall use the PPDU format indicated by the PPDU format member of the radio environment request vector related to the MSDU.
* When transmitting an MPDU that encapsulates an MSDU, an NGV STA shall use the data rate/NGV-MCS indicated by the data rate/NGV-MCS member of the radio environment request vector related to the MSDU in the initial transmission of the MPDU. In the retransmission of the MPDU, the data rate/NGVMCS shall be no more than data rate/NGV-MCS indicated by the data rate/NGV-MCS member of the radio environment request vector related to the MSDU.
* When transmitting an MPDU that encapsulates an MSDU, an NGV STA shall use the number of spatial streams indicated by the number of spatial streams member of the radio environment request vector related to the MSDU in the initial transmission of the MPDU. In the retransmission of the MPDU, the number of spatial streams shall be no more than the number of spatial streams indicated by the number of spatial streams member of the radio environment request vector related to the MSDU.
* An NGV STA shall transmit a frame that encapsulates an MSDU in an A-MPDU if the permitted aggregation member of the radio environment request vector related to the MSDU is equal to 1. Otherwise the NGV STA shall not aggregate the frame in an A-MPDU.
* An NGV STA shall set the lifetime of an MSDU to the value of expiry time member of the radio environment request vector related to the MSDU.
* An NGV STA shall transmit an MPDU that encapsulates an MSDU in the channel defined by the frequency band member, primary channel member and channel width member of the radio environment request vector related to the MSDU with the following exception:

~~—~~• If the channel width indicates 20 MHz channel width and the fallback enabled parameter indicates 1, the channel can be 10 MHz channel.

* An NGV STA shall transmit an MPDU that encapsulates an MSDU with the transmit power indicated by the transmit power spectral density member of the radio environment request vector related to the MSDU.

When reporting a received MSDU to the upper layer, an NGV STA shall report the radio environment status vector of the received MSDU as defined in 5.2.4 (MA-UNITDATA.indication).

# CID3017





# CID3018



