IEEE P802.11
Wireless LANs

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| 11az LB240 Comment Resolution Section 11.22.6.4.4 |
| Date: 2019-04-25 |
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Abstract

This submission proposes the comment resolution of CIDs (1829, 1160, 1161) in LB240 related to section 11.22.6.4.4

Revisions:

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 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.***

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

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1829 | 103.00 | 11.22.6.4.4.2 | "In the Ranging NDP Announcement frame, the ISTA shall set the UL Rep subfield of the STA7 Info field to a value in the range 0 to RSTA Assigned UL Rep; " should be 1-8 because RSTA assigned UL Rep and DL Rep is Max UL Rep + 1 and Max DL Rep +1 accordingly. | fix value range for RSTA Assigned UL and DL Rep to that of other places in the spec. | **Revised**Defintion of RSTA assigned UL/DL rep is same as definition of UL/DL rep in Ranging NDPA (0-7) |

TGaz Editor: change the paragraph in section 11.22.6.4.4.2 Non-TB Measurement Sounding Part as follows:

After transmitting the Ranging NDP Announcement frame and NDP frame, the ISTA shall wait or a time interval with a value of aSIFSTime + aSlotTime + aRxPHYStartDelay. This interval begins when the MAC receives a PHY-TXEND.confirm primitive of NDP frame. If a PHY-RXSTART.indication primitive does not occur during the the time interval, the ISTA shall conclude that the transmission of the Ranging NDP Announcement frame + NDP has failed. If a PHY-RXSTART.indication primitive occurred during the the time interval, the ISTA tries to receive the NDP and the LMR frame from the RSTA addressed by the Ranging NDP Announcement frame. If the LMR is correctly received from the RSTA, the frame exchange initiated by the Ranging NDP Announcement is complete.

In the non-TB measurement exchange sequence, the ISTA shall transmit the NDP-A frame with the same bandwidth as the UL NDP to reserve the medium and set UL Rep, DL Rep subfields of the STA Info field to a value in the range of 0 to RSTA assigned UL rep, 0 to RSTA assigned DL rep respectively; the RSTA shall transmit the DL NDP with the same bandwidth as the NDP-A and UL NDP, while the LMR can be transmitted at a different bandwidth, according to the rules of multiple frame transmission in an EDCA TXOP (see 10.22.2.7), i.e., not exceeding the bandwidth of the NDP-A, UL NDP and DL NDP. The allowed bandwidths for the NDP-A and UL/DL NDP frames are specified in the Format and Bandwidth subfield of the Ranging Parameters field (see 9.4.2.279).

Accordingly:

* 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. The TA field of the Ranging NDP Announcement frame is a bandwidth signaling TA when the Ranging NDP Announcement frame is sent in a non-HT duplicate PPDU (see 10.7.6.6)
* An ISTA transmitting an UL 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 DL NDP shall set the TXVECTOR parameter CH\_BANDWIDTH to the bandwidth of the Ranging NDP Announcement frame and/or the UL NDP frame; which are obtained from the RXVECTOR parameter CH\_BANDWIDTH of the Ranging NDP Announcement frame or UL NDP frame respectively. For the NDP-A frame, when not received in an HE/VHT/HT 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.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1160 | 103.00 | 11.22.6.4.4.2 | The text in this paragraph describes UL and DL Rep for non-secure non-TB transmissions and not secure non-TB. | Add a paragraph to describe the non-TB secure UL and DL Rep setting as to be the value assigned by the RSTA during the negotiation phase. | **Reject**Text in the paragraph applies to non-secure non-TB ranging, see 11.22.6.4.6.1 for secure variant |
| 1161 | 105.00 | 11.22.6.4.4.2 | Add a flow diagram to highlight t1, t2, t3 and t4 in Non-TB case similar to TB case and also add RTT equation for both ToA & Phase Shift type feedback. | As per comment | **Revised****Agreed in principle**Added timing diagram and associated RTT equations |

TGaz Editor: Insert the following paragrapsh and figures at end of section 11.22.6.4.4.2 Non-TB Measurement Sounding Part:

Both RSTA and ISTA perform TOF measurements by capturing the timestamps of the NDP frames. The ISTA records the time at which the UL NDP is transmitted (t1). The RSTA then captures the time at which the UL NDP arrives (t2) and records the time at which the DL NDP is transmitted (t3). The ISTA finally captures the time at which the DL NDP arrives (t4). See Figure 11-xxx. The timestamp values t2 and t3 shall be measured according to the RSTA’s clock (i.e., without applying any frequency offset correction to the time basis).



**Figure 11 -xxx Timing diagram of a Measurement Sounding part in non-TB Ranging**

The Round-Trip Time (RTT) is defined as

RTT = [(t4-t1) – (t3’-t2’)]

where t3’ and t2’ are the time at which the DL NDP was transmitted and the time at which the UL NDP was received, respectively, as converted by the ISTA from the RSTA’s time basis to its own time basis.

The mechanism by which the ISTA derives t3’ and t2’ from the TOD and TOA fields of the relevant LMR are implementation dependent.

The TOA field’s value contains a timestamp that represents the time, with respect to a time base, at which the start of the first HE-LTF of the associated NDP frame arrived at the receive antenna connector. The TOD field’s value contains a timestamp that represents the time, with respect to the same time base, at which the start of the first HE-LTF of the associated NDP frame appeared at the transmit antenna connector.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1805 | 102.00 | 11.22.6.4.4.2 | ACs are used to distinguish traffic types of different levels of priority. Allowing any AC to be used for randing NDP announcement is only meaningful if tehre are various possible levels of priority needed for such ranging exchange. Otherwise, high density of regular ranging exchanges may interfere with voice calls for example, thus making this standard a source of interference for delay-sensitive traffic, including in scenarios where ranging is not urgent. | Integrate the concept of priority (e.g. e911) and associate reasonable AC recommendations associated to the use case, thus using BE for standard exchanges and higher Acs based on the urgency of the exchange. | **Reject**In 11ax, Trigger frame can be sent after the backoff counter of any AC becomes 0. The same rules applies to ranging NDP Announcement. Another reason for this is that the exchanged frames in NDP ranging are not classified to any AC |