IEEE P802.11
Wireless LANs

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| Tx Power Control for Non-TB Ranging |
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Abstract

This submission proposes the comment resolution of CID 3883 in LB249 related to Tx power control and pathloss measurements

Revisions:

1. Added a support bit in Ranging Parameters

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** |
| **3883** | 43.3 | 9.3.1.19 | Similar to AP\_TX\_POWER in Trigger frame NDP TX power will be useful for pathloss computation and power control | Add NDP TX power in STA Info field in NDPA | **Revised**See changes in DCN 11-20/1245 |
|  |  |  |  |  |  |

**9.3.1.19 VHT/HE/Ranging NDP Announcement frame format**

TGaz Editor: Change the Figure 9-61b as follows:



Figure 9-61b STA Info field format in a Ranging NDP Announcement frame

TGaz Editor: Change the following paragraphs after Figure 9-61a as follows:

A Ranging NDP Announcement frame contains one STA Info field per STA that is intended to receive this frame. In the case of the non-TB ranging protocol, there is always only one intended receiver and accordingly only one STA Info field (#**2418**), see [11.22.6.4.4](file:///C%3A%5CUsers%5Cnxf57284%5CDocuments%5CIEEE%5CCopy%20of%20Draft%20P802.11az_D2.2.doc#H11o22o6o4o4) (Non-TB Ranging measurement exchange), but the Ranging NDP Announcement frame also (#**1192**. #**1706**) has the optional STA Info SAC field present when operating in secure mode; see [11.22.6.4.6.1](file:///C%3A%5CUsers%5Cnxf57284%5CDocuments%5CIEEE%5CCopy%20of%20Draft%20P802.11az_D2.2.doc#H11o22o6o4o6o1) (Secure Non-TB ranging mode).

The AID11/RSID11 subfield contains the 11 least significant Bits of the AID or RSID of an associated STA or an unassociated STA respectively (#**1194**, #**1608**, #**1771**, #**1785**), expected to process the following NDP.

The Tx Power/Offset subfield contains the Tx Power value or the Offset value, when used in Non-TB or TB Ranging measurement exchange respectively. (#3883)

The Tx Power value indicates the combined average power per 20 MHz bandwidth referenced to the antenna connector, of all antennas used to transmit the following I2R NDP. The transmit power is reported with a resolution of 1 dB, with values in the range 0 to 60 representing –20 dBm to 40 dBm, respectively. Values above 60 are reserved. (#3883)

The Offset value is between 0 and 63 and indicates the number of HE-LTF to skip when processing the following NDP and is set 0 in all cases except in [11.22.6.4.6.2](file:///C%3A%5C%5CUsers%5C%5Cnxf57284%5C%5CDocuments%5C%5CIEEE%5C%5CCopy%20of%20Draft%20P802.11az_D2.2.doc%22%20%5Cl%20%22H11o22o6o4o6o2) (Secure TB ranging mode) the secure variant of the TB Ranging measurement exchange.

When used as part of the TB Ranging measurement exchange, R2I N\_STS and R2I Rep subfields are used to indicate the following R2I NDP’s HE-LTF configuration; see [27.3.18b](file:///C%3A%5CUsers%5Cnxf57284%5CDocuments%5CIEEE%5CCopy%20of%20Draft%20P802.11az_D2.2.doc#H27o3o18b) (HE TB Ranging NDP).

When used as part of the Non-TB Ranging measurement exchange, the I2R N\_STS and I2R Rep subfields are used to indicate the following I2R NDP’s HE-LTF configuration, [27.3.18b](file:///C%3A%5CUsers%5Cnxf57284%5CDocuments%5CIEEE%5CCopy%20of%20Draft%20P802.11az_D2.2.doc#H27o3o18b) (HE TB Ranging NDP), while the R2I N\_STS and R2I Rep subfields indicate the HE-LTF configuration of the R2I NDP sent in response by the RSTA, see subclause [11.22.6.4.4](file:///C%3A%5CUsers%5Cnxf57284%5CDocuments%5CIEEE%5CCopy%20of%20Draft%20P802.11az_D2.2.doc#H11o22o6o4o4) (Non-TB Ranging measurement exchange).

9.4.2.296 Ranging Parameters element

TGaz Editor: Change Figure 9-1007—Non-TB specific subelement format as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B15 |  B16 | B17 B39 | B40 B59 | B60 B63 |
|  | Subelement ID (0) | Length |  Pathloss Measurements(#**3231,#3883**) | Min Time Between Measurements | Max Time Between Measurements | Reserved |
| Bits: | 8 | 8 | 1 | 23 | 20 | 4 |

1. Figure 9-1007—Non-TB specific subelement format

(#**2275,** #**2276,** #**2278,** #**1654,** #**1220**)

The Subelement ID and Length fields are defined in 9.4.3 (Subelements). (#**2081**)

TGaz Editor: Add the following paragraphs to 9.4.2.296:

The Pathloss Measurements field in the IFTMR frame is set to 1 to indicate that the ISTA supports announcing the tx power of its I2R NDP frames in the Tx Power/Offset subfield in the STA Info field of the preceeding NDP Announcement frame. The Pathlosss Measurement field in the initial Fine Timing Masurement frame is set to 1 to indicate that the RSTA supports reporting RSSI measurements of I2R NDP frames in the RSSI Feedback field in the LMR frames. (#**3883**)

9.6.7.48 Location Measurement Report frame format

TGaz Editor: Change Figure 9-981b as follows:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Category | Public Action | Dialog Token | ToD | ToA | ToD Error | ToA Error |
| Octets: | 1 | 1 | 1 | 6 | 6 |  1 | 1 |
|  | CFO Parameter  | RSSI Feedback | Secure LTF Parameter (optional) | AoA Feedback (optional) |
| Octets: | 2 | 1 | 13 | 9 |

Figure 9-981a Location Measurement Report Action field format

TGaz Editor: Add the following paragraphs to 9.6.7.48:

The CFO parameter field in I2R LMR indicates the clock rate difference between ISTA and RSTA in units of 0.01 ppm. The CFO parameter field is a signed value of length 2 octets. In RSTA2ISTA LMR, the value of the CFO parameter field is reserved.

The format of the RSSI Feedback field is defined in Figure 9-981x (RSSI Feedback field), it contains the RSSI type and Received RSSI subfields. It is used in the R2I LMR to let the RSTA feed back RSSI information to the ISTA, the subfield values are reserved when transmitted as part of an I2R LMR (#3883).

TGaz Editor: Add Figure 9-981x here:



Figure 9-981x - RSSI Feedback field

The Received RSSI subfield indicates, in units of dBm, the received power at the RSTA (i.e., averaged RSSI over all the antennas) of an I2R NDP. The received power at the RSTA is calculated as ReceivedRSSI = –110 + 2×*FVal*, where *FVal* is the value of the Received RSSI subfield, except that the value 63 indicates that the RSTA cannot report received RSSI.

The RSSI type subfields indicate if the reported RSSI is an average over multiple I2R NDPs. If the RSSI type subfield is set to zero, the value in the Received RSSI subfield corresponds to the same I2R NDP as the one refered to by the ToA field in this Location Measurement Report frame. If the RSSI type subfield is set to one, then the received RSSI is an average RSSI over multiple previously received I2R NDPs. (#3883)

11.22.6.4.5 Transmission of a ranging NDP

TGaz Editor: Add the following paragraph to 11.22.6.4.5 (on page 152, line 14):

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

* The FORMAT parameter is set to HE\_SU
* The UPLINK\_FLAG parameter is set to 1
* The APEP\_LENGTH parameter is set to 0
* The NUM\_STS parameter is set to the same value as the I2R N\_STS subfield in the STA Info field in the preceding Ranging NDP Announcement frame
* The LTF\_REP parameter is set to the same value as the I2R Rep subfield in the STA Info field in the preceding Ranging NDP Announcement frame
* The TXPWR\_LEVEL\_INDEX parameter is set to a value that matches the Tx Power value indicated in the Tx Power/Offset subfield in the preceeding Ranging NPD Announcement frame, except if the value in the TxPower/Offset subfield was set to a reserved value. (#3883)