IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Non-TB Pathloss Measurements | | | | |
| Date: 2019-11-07 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Christian Berger | Marvell | 5488 Marvell Ln, Santa Clara, CA 95054 |  | crberger@marvell.com |
| Feng Jiang | Intel | 3600 Juliette Ln, Santa Clara, CA 95054 |  | feng1.jiang@intel.com |
| Qinghua Li | Intel | 3600 Juliette Ln, Santa Clara, CA 95054 |  | qinghua.li@intel.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes the comment resolution of CIDs in LB240 related to EVM and pathloss measurements

CIDs: 2301, 1331

Revisions:

1. Added CID 1331, added a field in LMR that includes received RSSI and target RSSI subfields, added co-authors

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.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2301 | 150.02 | 28.3.4 | For both HE Ranging NDP and HE TB Ranging NDP, the EVM requirement need to be specified in order to improve the ranging accuracy. | As in comment. | **Revised:**  For Non-TB Raning:  Currrenlty we have no way for either ISTA or RSTA to know what an appropriate EVM is, since the pathloss is not known and hard to estimate. By adding pathloss estimation, appropriate tx power can be selected leading to improved EVM. See changes in document DCN 1951  For TB Ranging:  See CID 1331 |
| 1331 | 36.21 | 9.3..1.23.9.2 | Is there any EVM requirement specified in the user information field | as in the comment | **Rejected:**  There is no EVM requirement specified in the user information field. The AP will only specify target RSSI as in 11ax TB mode. The ISTAs are expected to produce the best possible EVM while achieving the target RSSI. The AP is assumed to group the ISTAs and select reasonable target RSSI as to allow for sufficient EVM margins. |

9.3.1.19 VHT/HE/Ranging NDP Announcement frame formats

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 accordlingly only one STA Info field (#**2418**) (see subclause 11.22.6.4.4 4 7 Measurement Phase in Non-TB Mode), but the Ranging NDP Announcement frame may also (#**1192**. #**1706**) contain the optional STA Info SAC field present when operating in secure mode (see 11.22.6.4.6.1).

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 frame.

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.

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 (#2301).

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 **9-1006** the secure variant of the TB Ranging measurement exchange.

When used as part of the TB Ranging measurement exchange, the R2I N\_STS and R2I Rep subfields are used to indicate the following R2I NDP’s HE-LTF configuration, see subclause 27.3.17b.

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, 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.

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 | 2 | | 13 | | 9 | |

Figure 9-981b Location Measurement Report Action field format

TGaz Editor: Add the following paragraphs to 9.6.7.48:

The CFO parameter field in ISTA2RSTA 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, it contains the Received RSSI and Target RSSI subfields. It is used in the RSTA2ISTA LMR to let the RSTA feed back RSSI information to the ISTA, the subfield values are reserved when transmitted as part of an ISTA2RSTA LMR (#2301).

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 received RSSI corresponds to the same I2R NDP as the one refered to by the ToA field in this Location Measurement Report frame (#2301).

The Target RSSI subfield indicates the expected receive signal power, averaged over the RSTA's antenna connectors, for the next I2R NDP to be transmitted by the ISTA. The resolution for the Target RSSI subfield is 2 dB and is calculated as TargetRSSI = –110 + 2×*FVal*, where *FVal* is the value of the Target RSSI subfield, except that the value 63 indicate that the RSTA has no Target RSSI expectation and the ISTA should select a transmit power value independently (#2301).

11.22.6.4.5 Transmission of a ranging NDP

TGaz Editor: Add the following paragraph to 11.22.6.4.5:

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 zero
* 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