IEEE P802.11
Wireless LANs

|  |
| --- |
| 11az Location Measurement Report frame format Amendment Text |
| Date: 2019-01-09 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Christian Berger  | Marvell |  |  |  |
| Liwen Chu | Marvell |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission adds to the Ranging Parameters Element.

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 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.***

9.6.7.37 Location Measurement Report frame format

TGaz Editor: Modify the following paragraph of 9.6.7.37:

The Location Measurement Report frame is an Action No Ack frame of category Ranging. The Location Measurement Report frame is used to support the non-TB and TB ~~DMGz, and eDMGz~~ ranging mechanisms of the FTM procedure described in 11.22.6 (Fine timing measurement (FTM) procedure). The format of the Location Measurement Report Action field is shown in Figure 9-xxx (Location Measurement Report Action field format).

TGaz Editor: Change Figure 9-610b as follows:

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

|  |
| --- |
| **Figure 9-xxxx - ~~Fine Timing Measurement Report~~ Location Measurement Report Action field format** |

TGaz Editor: Modify the following paragraphs of 9.6.7.37:

The Category field is defined in 9.4.1.11 (Action field).

The Public Action field is defined in 9.6.~~8~~7.1 (Public Action frames).

The Dialog Token field ~~is TBD~~ shall be copied from the Sounding Dialog Token field in the Ranging NDP Announcement frame whose NDP exchange from which the reported ToA and ToD values were measured (see 11.22.6.4.3 Measurement Exchange in TB Mode and 11.22.6.4.4 Measurement Phase in Non-TB Mode).

~~The ToD field is TBD.~~

~~The ToA field is TBD.~~

The ToD and ToA fields are expressed in units of picoseconds.

The ToD field contains a timestamp that represents the time, with respect to a time base, at which the first HE-LTF symbol of the corresponding NDP frame appeared at the transmit antenna connector. The corresponding NDP frame in an RSTA-2-ISTA Location Measurement Report (LMR) frame is a DL NDP, while in an ISTA-2-RSTA LMR frame it is an UL NDP. In both cases the corresponding NDP frame refers to a measurement exchange that included an NPD-A which carried the matching dialog token that is also included in this LMR.

The ToA field contains a timestamp that represents the time, with respect to a time base, at which the first HE-LTF symbol of the corresponding NDP frame arrived at the receive antenna connector. The corresponding NDP frame in an RSTA-2-ISTA LMR frame is an UL NDP, while in an ISTA-2-RSTA LMR frame it is a DL NDP. In both cases the corresponding NDP frame refers to a measurement exchange that included an NPD-A which carried the matching dialog token that is also included in this LMR.

The ToD Error field is ~~TBD~~ structured as shown in Figure 9-xxyy (Format of the ToD Error field).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B4 | B5 B6 | B7 |
|  | Max ToD Error Exponent | Reserved | ToD not continuous |
| Bits: | 5 | 2 | 1 |

Figure 9-xxyy – Format of the ToD Error field

The ToA Error field is ~~TBD~~ structured as shown in Figure 9-xxzz (Format of the ToA Error field).

|  |
| --- |
|  |
|  | B0 B4 | B5 | B6 | B7 |
|  | Max ToA Error Exponent | Reserved | Invalid Measure-ment | ToA Type |
| Bits: | 5 | 1 | 1 | 1 |

Figure 9-xxzz – Format of the ToA Error field

The maximum errors in the ToD and ToA values are represented using the function defined in Equation (9-xyz).

$$E\_{max}=\left\{\begin{matrix}unknown, F=0\\2^{F-1}, 1\leq F\leq 30\\\geq 2^{30}, F=31\end{matrix}\right.$$

Where F is the Max Error Exponent and Emax is the maximum ToD or ToA error, respectively, in units of picoseconds.

The Max ToD Error Exponent field contains an upper bound for the error exponent in the value specified in the ToD field.

The ToD Not Continuous field indicates that the ToD value is with respect to a different underlying time base than the last transmitted ToA value. It is set to 1 when a discontinuity is present. Otherwise, it is set to 0.

The Max ToA Error Exponent field contains an upper bound for the error exponent in the value specified in the ToA field.

The Invalid Measurement field contains an invalid indication for the ToA field. The Invalid Measurement field is set to 1 to indicate that the ToA value is invalid and the value 0 in this field indicates that the ToA value is valid.

The ToA Type subfield indicates if the the ToA timestamp was calculated based on the first arrival path of the channel impulse response or the average linear phase across the subcarriers.

A value of 0 for the Max ToD Error Exponent or the Max ToA Error Exponent field indicates that the upper bound on the error in the corresponding ToD or ToA value is unknown. A value of 31 indicates that the upper bound on the error is greater than or equal to 1.073 741 824 ms.

The CFO parameter field in ISTA-to-RSTA LMR indicates the clock rate difference between ISTA and RSTA in units of ~~TBD~~ 0.5 ppm. The length of the CFO parameter field is ~~TBD~~ 1 octet. In RSTA-to-ISTA LMR, the value of the CFO parameter field is reserved.

The Secure LTF Parameters field is present if an ISTA and RSTA have activated~~s~~ a secure LTF measurement exchange mode (see 11.22.6.3.2 Secure LTF measurement setup) ~~of the 802.11az ranging protocols for the ranging phase~~. If present, it contains a Secure LTF Parameters element as defined in 9.4.2.~~251~~280 (Secure LTF Parameters).

The AoA Feedback field is optionally present. If present, it contains a Direction Meaurement Results element (see 9.4.2.281 Direction Measurement Results element).

~~The Ranging CSI Information field is TBD.~~