IEEE P802.11
Wireless LANs

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| Phase shift feedback response |
| Date: 2020-11-03 |
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Abstract

This document proposes resolutions to TGaz LB249 comments related to the definition of the clock from which the FTM timestamps are reported.

The TGaz LB249 CID addressed in this document is CID 3311.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3311 | 122.31 | 11.22.6.3.3 | It is not specified how phase shift feedback reporting works if the ISTA is reporting phase shift TOAs in non-TB and TB ranging. How will the ISTA get the required information from the RSTA in order to compute the RTT? | Add specification and description for the case when the ISTA is reporting phase shift TOAs in non-TB and TB ranging and how the ISTA will get the required information from the RSTA in order to compute the RTT. | Revised. TGaz editor, make the changes as shown in document https://mentor.ieee.org/802.11/dcn/20/11-20-1556-03-00az-lmr-timestamp-clock-and-reporting.docx. |

**Discussion for CIDs 3311:** When the ISTA, or an RTSTA, is reporting PSTOA timestamps, the ISTA or RSTA needs to get an adjusted TOA (or TOD but we chose to adjust the TOA) from the RSTA or ISTA so that when it calculates the range, using its reported PSTOA in place of of its TOA, it comes out correct.

***TGaz Editor: Change the text in Subclause 11.21.6.3.3 (Negotiation for TB and Non-TB Ranging measurement exchange) as follows):***

**11.21.6.3.3 Negotiation for TB and Non-TB Ranging measurement exchange**

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An ISTA and an RSTA may negotiate a phase shift feedback mode of the Non-TB Ranging and TB Ranging measurement exchange (11.21.6.4.3), for either the RSTA2ISTA LMR and/or ISTA2RSTA LMR. In this case, instead of the TOA t2 of the I2R NDP, the RSTA2ISTA LMR carries the phase shift tp2 of I2R NDP and instead of the TOA t4 of the R2I NDP, the I2R LMR carries phase shift tp4 of R2I NDP. The ISTA and RSTA can use Equations (11-xx) and (11-yy) to derive the RTT.

When an ISTA has negotiated to report phase shift feedback, the RSTA shall measure both the PSTOA, tp2, and TOA, t2, on the ranging NDP it receives from the ISTA and shall subtract the difference, tp2-t2, from the TOA for the ISTA’s ranging NDP, t4, and report an adjusted TOA, t4\_adj = t4 – (tp2-t2), to the ISTA in the R2I LMR frame. This way, when the ISTA uses this adjusted RSTA TOA when it calculates its RTT combined with its own reported PSTOA, the calculated RTT comes out right. **(#3311)**

When an RSTA has negotiated to report phase shift feedback, and I2R LMR feedback has also been negotiated, the ISTA shall measure both the PSTOA, tp4, and TOA, t4, on the ranging NDP it receives from the RSTA and shall subtract the difference from TOA for the RSTA’s ranging NDP, t2, and report an adjusted TOA, t2\_adj = t2 – (tp4-t4), to the ISTA in the I2R LMR frame. This way, when the RSTA uses this adjusted ISTA TOA when it calculates its RTT combined with its own reported PSTOA, the calculated RTT comes out right. **(#3311)**

An RSTA in which dot11PhaseShiftFeedbackImplemented is true shall set the Phase Shift Feedback Support field in the Extended Capabilities element to 1 to indicate RSTA’s capability.

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**References:**

**[1] Draft P802.11az\_D2.5**