IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phase shift feedback response | | | | |
| Date: 2020-11-05 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | Email |
| Erik Lindskog | Samsung | 3655 N 1st St, San Jose, CA 95134 |  | e.lindskog@samsung.com |

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.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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/20/11-20-1733-01-00az-phase-shift-feedback-response.docx. |

**Discussion for CIDs 3311:** The current negotiation for phase shift feedback focusses on the side that would be the receiver of the phase shift feedback and enables that side to request the other side to provide phase shift feedback, assuming that side has signaled that it is capable to provide phase shift feedback.

There is a different use case that is of interest and that is when an ISTA prefers to feed back PSTOA, maybe because it knows its TOA measurements are not the best. It may then instead prefer to feed back PSTOA and rely on the RSTA to measure the TOA, thinking that the RSTA would be able to provide a TOA measurement of higher quality. In this case for the ISTA to be able to measure RTT using its measured PSTOA, the RSTA needs to feed back an adjusted TOA so that when the ISTA calculates the range, using its reported PSTOA and this adjusted TOA reported by the RSTA, the RTT comes out correct.

We can enable this use case by allowing the ISTA to *request* the RSTA to feed back this adjusted TOA by setting the I2R LMR feedback subfield to 0 and the I2R TOA Type subfield to 1 in the Ranging Parameters field in an IFTMR frame, and having the RSTA confirming sending the adjusted TOA by in the initial Fine Timing Measurement frame setting the I2R LMR feedback subfield to 0 and the I2R TOA subfield to 1.

***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**

… <Scroll to P128L5>

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.

If an RSTA has set the Phase Shift Feedback Support field in the Extended Capabilities element to 1, an ISTA may by setting the I2R LMR feedback subfield to 0 and the I2R TOA Type subfield to 1 in the Ranging Parameters field in an IFTMR frame, *request* the RSTA to feed back an adjusted TOA, t2\_adj = t2 – (tp2 – t2), where t2 is the TOA and tp2 is the PSTOA for the I2R NDP, measured by the RSTA. The RSTA shall confirm feeding back this adjusted TOA in its R2I LMR frame by in the initial Fine Timing Measurement frame setting the I2R LMR feedback subfield to 0 and the I2R TOA subfield to 1. **(#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.

**----------------------------------------------------------------- X -----------------------------------------------------------**

**References:**

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