IEEE P802.11
Wireless LANs

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| Comment resolutions for TWT fixes |
| Date: 2019-01-11 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D3.0 with the following CIDs (1 CIDs):

* 16737

Revisions:

* Rev 0: Initial version of the document.

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 TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 16737 | SAI SHANKAR NANDAGOPALAN | 148.39 | Use of TWT information frames. It is not mandated as part of certification in certification body of 802.11ax program and hence request this bit of supported or not supported to be included in HE MAC capabilities. | Use one of the reserved bits b45 to b47 to indicate that. | Revised –This CID was discussed, and a reject resolution was provided in Nov F2F meeting as part of 11-18/1473r2:“*TWT Informaiton frames are a subpart of the TWT operation procedure, and while its use may not be tested as part of a certification body, its nontestability would not bring any interop issues since the STA that ignores the instructions in the TWT information frame would take a performance hit because the transmitting STA will not be there for the exchange.*”The rejection is re-considered, since an erroneous behavior from the recipient side would bring performance degradation which is not desirable. As such the proposed resolution is to allow the recipient to enable/disable reception of this frame so that it is inline with activities in other programs and does not bring performance degradation. The proposed resolution however does not use a capability bit since there is only one left but uses one of the available 4 bits present in the TWT element itself.In addition, as part of the proposed resolutions, we are providing clarifications regarding the selection of the TWT Flow ID, how the update of the parameters is performed for an existing TWT session, and the setting of the dialog token for an unsolicited TWT (using same functionalities of other protocols in the baseline).TGax editor to make the changes shown in 11-18/0096r0 under all headings that include CID 16737. |

**Discussion: *None.***

**9.6.24.8 TWT Setup frame format**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 16737):***

In a TWT Setup frame with a TWT Request field that is equal to 1, the Dialog Token field is set to a nonzero value chosen by the transmitting STA to identify the request/response transaction. In a TWT Setup frame with a TWT Request field equal to 0 that is sent in response to a TWT Setup frame with a TWT Request field that is equal to 1, the Dialog Token field is set to the value copied from the corresponding received TWT Setup frame with a TWT Request field equal to 1. In a TWT Setup frame with a TWT Request field equal to 0 that is not sent in response to a TWT Setup frame with a TWT Request field equal to 1, the Dialog Token field is set to 0. *(#16737)*

**10.48.1 TWT overview**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 16737):***

An AP with dot11TWTOptionActivated equal to true shall transmit a TWT element to a STA that is associated to the AP and from which it received a frame containing a TWT element that contained a value of Request TWT, Suggest TWT or Demand TWT in the TWT Command field and with the TWT Request field equal to 1. The transmitted TWT element shall be included in the frame that is the appropriate response frame to the received frame. The AP shall include a value of Accept TWT, Alternate TWT, Dictate TWT or Reject TWT in the TWT Command field of the response and shall set the TWT Request field to 0. If the AP response’s TWT Command field includes anything other than Accept TWT or Reject TWT, the STA should send a new request for a TWT value by sending another frame that contains a TWT element, modifying the parameters of the request to indicate, for example, an acceptance of a proposed alternate TWT or dictated TWT value. If the STA receives a TWT response to a TWT request with the TWT Command value of Accept TWT, then the STA has successfully completed a TWT setup with that STA for the TWT Flow Identifier indicated in the TWT response and the STA becomes a TWT requesting STA and the STA may enter the Doze state until the TSF matches the next TWT value of the STA, provided that the STA has indicated that it is in a power save mode and no other condition requires the STA to remain awake. The AP becomes a TWT responding STA of the TWT requesting STA.

NOTE 1—A TWT responding STA might choose a TWT Flow Identifier for the TWT response that is different from the TWT Flow Identifier of a received TWT request.

NOTE 2—A TWT requesting STA might re-negotiate the TWT parameters of an existing TWT agreement by sending to the TWT responding STA a TWT request with a Flow Identifier that corresponds to that TWT agreement. The TWT response sent by the TWT responding STA containing the TWT Command of Accept TWT will indicate whether the newly requested TWT parameters are accepted or whether the previously negotiated TWT parameters are still in place. *(#16737)*

**27.8.2 Individual TWT agreements**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 16737):***

An HE AP may send an unsolicited TWT response with the Trigger subfield equal to 1 to a non-AP HE STA that has set the TWT Requester Support subfield to 1 in the HE Capabilities elements that it transmits to the AP. The TWT response shall have one of these values in the TWT Command field: Accept TWT, Alternate TWT or Dictate TWT. An unsolicited TWT response with TWT Command of Alternate TWT or Dictate TWT contains an advisory notification to the recipient of TWT parameters that are likely to be accepted by the AP if the recipient transmits a subsequent TWT request to the AP that includes those TWT parameters. An unsolicited TWT response with the TWT Command of Accept TWT creates a TWT agreement between the two STAs. A STA that received an unsolicited TWT response with the TWT Command of Accept TWT may transmit a TWT Teardown frame to delete the unsolicited individual TWT agreement.

NOTE—The HE AP might send an unsolicited TWT response to a non-AP HE STA with a TWT Flow Identifier that corresponds to an existing TWT agreement. The unsolicited TWT response with TWT Command of Accept TWT will indicate new TWT parameters that are different from the previously negotiated TWT parameters for that TWT agreement. *(#16737)*

**9.4.2.199 TWT element**

**TGax Editor: *Insert “TWT Information Frame Enabled” bit as B4 of the Control field format in Figure 9-680 (Control field format) and reducing the Reserved field to 3 bits (and have it start from B5) (#CID 16737).***

**TGax Editor: *Insert the paragraph below after paragraph “The Negotiation Type subfield as follows” (#CID 16737):***

The TWT Information Frame Enabled subfield is set to 1 to indicate that the reception of TWT Information frames is enabled by the STA; otherwise, it is set to 0. *(#16737)*

**27.8.4.2 TWT information for individual TWT**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 16737):***

An HE STA that has an individual TWT agreement may transmit a TWT Information frame to the peer STA with which it has the agreement if the peer STA has set the TWT Information Frame Enabled field to 1 in the TWT element sent during TWT setup; otherwise the HE STA shall not transmit a TWT Information frame to the peer STA. The HE STA sets the fields of the TWT Information frame as defined in Table 27.8.4.1 (General). *(#16737)*

**27.8.4.3 TWT information for broadcast TWT**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 16737):***

An HE STA that is a TWT scheduling AP may transmit a TWT Information frame to any of the members of a broadcast TWT schedule if the member has set the TWT Information Frame Enabled field to 1 in the TWT element sent when joining the broadcast TWT schedule. An HE STA that is a TWT scheduled STA may transmit a TWT Information frame to the TWT scheduling AP corresponding to a broadcast TWT schedule established by that STA if the AP has set the TWT Information Frame Enabled field to 1 in the broadcast TWT element it transmits. The HE STA sets the fields of the TWT Information frame as defined in 27.8.4.1 (General). *(#16737)*