IEEE P802.11
Wireless LANs

|  |
| --- |
| Comment resolutions for 27.7.5 |
| Date: 2018-03-01 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Alfred Asterjadhi | Qualcomm Inc. | 5775 Morehouse Dr, San Diego, CA 92109 | +1-858-658-5302 | aasterja@qti.qualcomm.com |
| George Cherian | Qualcomm Inc. |  |  |  |
| Abhishek Patil | Qualcomm Inc. |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGax D2.0 with the following CIDs:

* 11353, 11854, 12539, 13793, 13926, 13927 (7 CIDs)

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: CID 11353 is deferred. No other changes in the document.
* Rev 2: Updated document so that there are no instructions to the editor for CID 11353. Rest is unchanged.

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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
|  |  |  |  |  |  |
| 11854 | Guoqing Li | 286.41 | The use of Cascase indication as a means to early terminate TWT SP is confusing. According to this paragraph, when a STA receives a trigger that is intended for it that has cascade set to 0, then the STA shall stay awake. But if the trigger is not intended for the STA that has cascade set to 0, then the STA may go to doze. This seems unreasonable. The definition of cascade indication is whether the AP will send addtional trigger or not, it is not defined as a means to terminate SP under some special condition. | Delete this paragraph. |  Revised –Agree in principle to removing the paragraph but not for the reasons in the comment. Removal of the paragraph is because these conditions are TWT SP termination events, as such they need to be listed in the TWT SP termination events, not as separate behaviors. Regarding the comment it is not clear which part is confusing, since the comment itself clearly indicates an understanding of the rule. The definition of having the AP indicate a sequence of Trigger frames can only benefit the STA if the STA performs certain functionality upon reception of that signaling. This paragraph specifies that the STA can save power upon reception of the Trigger frame not intended to it with a Cascade Indicaiton of 0 (now More TF).TGax editor to make the changes shown in 11-18/0370r2 under all headings that include CID 11854. |
| 12539 | Liwen Chu | 285.41 | "Idenfitied by TWT requesting STA"TWT requesting STA itself can't identify a TWT SP start time. TWT flow ID has to be used. | Fix the issue mentioned in comment. | Revised –Agree in principle with the comment. Proposed resolution clarifies further this aspect by specifying how the TWTs are identified. TGax editor to make the changes shown in 11-18/0370r2 under all headings that include CID 12539. |
| 13793 | Yanjun Sun | 284.58 | As described in section 27.7.4, a TWT Information field/frame provides a mechanism to suspend and resume TWT sessions. | Remove or update paragraph starting line 58 | Revised –Agree in principle with the comment. Proposed resolution clarifies further this aspect by removing the paragraph and adding the TWT information exchange as part of the TWT SP termination exchanges.TGax editor to make the changes shown in 11-18/0370r2 under all headings that include CID 13793. |
| 13926 | Yongho Seok | 285.64 | "In addition to a TWT Information frame that terminates a TWT SP, the following events also terminate a TWT SP:"A termination of a TXOP (e.g., a transmission of a CF-End or a CTS-to-self in 10.22.2.10) should be also considered as a TWT SP termination event. | Add a termination of a TXOP into a TWT SP termination. | Rejected –A TWT SP can consist of multiple TXOPs, the termination of which cannot terminate the TWT SP. The TWT SP termination can be achieved transmitting a TWT Information frame, a QoS frame with EOSP field set to 1, or a control response (Ack, BlockAck) with the MD field set to 0. |
| 13927 | Yongho Seok | 286.35 | "A TWT requesting STA or TWT scheduled STA in PS mode that is awake for an unannounced trigger-enabled TWT SP may transition to the doze state after the reception of a Trigger frame sent by the TWT responding STA or TWT scheduling AP with the Cascade Indication field equal to 0 that is not intended for the TWT requesting STA or TWT scheduled STA."Is there any normative behavior that a TWT scheduling AP in an unannounced trigger-enabled TWT SP can't transmit a frame to the TWT scheduled STA after sending a Trigger frame with the Cascade Indication field equal to 0 that is not intended for the TWT scheduled STA?It seems that a TWT scheduling AP in an unannounced trigger-enabled TWT SP can transmit a frame after sending a Trigger frame with the Cascade Indication field equal to 0. | Remove the cited paragraph. | Revised –Agree in principle to removing the paragraph but not for the reasons in the comment. Removal of the paragraph is because these conditions are TWT SP termination events, as such they need to be listed in the TWT SP termination events, not as separate behaviors. Regarding the comment: There is no normative behavior on whether the AP can transmit a frame to a STA in that case since the AP is generally allowed to do whatever it wants. The only normative behavior for the AP’s concern is the declaration that the STA may go to doze state upon reception of that signaling, as such any frame that the AP transmits to the STA will go to waste. TGax editor to make the changes shown in 11-18/0370r2 under all headings that include CID 13927. |

**Discussion: *None.***

* PS operation during TWT SPs

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 12539):***

The following rules apply to TWT SPs for both broadcast TWT schedules and individual TWT agreements where the TWT SP of a broadcast TWT is uniquely identified by the <broadcast TWT ID, MAC address of TWT scheduling AP> tuple and the TWT SP of an individual TWT is uniquely identified by the <TWT flow identifier, MAC address of TWT requesting STA, MAC address of TWT responding STA> triple.*(#12539)*A TWT requesting STA or a TWT scheduled STA that is not in PS mode and that transmits a frame with the Power Management subfield set to 1 during a TWT SP shall remain in the awake state until the AdjustedMinimumTWTWakeDuration time has elapsed from the TWT SP start time or until a TWT SP termination event is detected, whichever occurs first for that particular TWT SP.*(#12539)*

A TWT requesting STA or a TWT scheduled STA in PS mode that is in awake state for aTWT SP may transition to the doze state after AdjustedMinimumTWTWakeDuration time has elapsed from the TWT SP start time even if it has previously transmitted a PS-Poll frame or U-APSD trigger and has not yet received the expected frames from the AP in response.*(#12539)*

When a TWT SP termination event is detected within a TWT SP by a STA in PS mode that is participating in the TWT SP, the STA may transition to the doze state without waiting for the expiration of the AdjustedMinimumTWTWakeDuration time as described in 10.43.1 (TWT Overview) even if it has previously transmitted a PS-Poll frame or U-APSD trigger and has not yet received the expected frames from the AP in response.

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 13793):***

*(#13793)***TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11353, 13793, 11854, 13927):***

A TWT requesting STA or a TWT scheduled STA shall classify any of the following events asa TWT SP termination event:

* The successful exchange of a TWT Information frame with the TWT responding STA or the TWT scheduling AP (see 27.7.4 (Use of TWT Information frames)) *(#13793)*
* The transmission by the TWT requesting STA or TWT scheduled STA of an acknowledgement in response to an individually addressed frame sent by the TWT responding STA or TWT scheduling AP, respectively, that had the EOSP subfield equal to 1
* The transmission by the TWT requesting STA or TWT scheduled STA of an acknowledgement in response to an individually addressed frame sent by the TWT responding STA or TWT scheduling AP, respectively with the More Data field equal to 0 when the frame does not contain an EOSP subfield
* The reception of a frame sent by the TWT responding STA or TWT scheduling AP that does not solicit an immediate response, and that had an EOSP subfield present with a value equal to 1
* The reception of an individually addressed frame sent by the TWT responding STA or TWT scheduling AP that does not solicit an immediate response and that had no EOSP subfield present but had the More Data field equal to 0
* The reception of a Trigger frame sent by the TWT responding STA or TWT scheduling AP that has the More TF field equal to 0 and is not intended for the TWT requesting STA or TWT scheduled STA provided that the TWT requesting STA or TWT scheduled STA is either awake for an announced trigger-enabled TWT SP but did not transmit an indication that it is in the awake state to the TWT responding STA or TWT scheduling AP or is awake for an unannounced trigger-enabled TWT SP*(#11854, 13927)*

The classification of a More Data field equal to 0 in an Ack, BlockAck and Multi-STA BlockAck frame as an event that terminates a TWT SP is only possible when both STAs have indicated support of transmitting or receiving the frame with a nonzero More Data subfield, which is indicated in the More Data Ack subfield of the QoS Info field of frames they transmit (see 11.2.2 (Power management in a non-DMG infrastructure network)).

NOTE 1—A STA participating in multiple TWT SPs which overlap in time stays in the awake state until the latest AdjustedMinimumTWTWakeDuration time of all of the TWT SPs expires, except that a TWT termination event causes all of the overlapping TWT SPs to terminate.

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11854, 13927):***

 *(#11854, 13927)*

NOTE 2—A Trigger frame, sent by the TWT scheduling AP(#6919), is defined as intended for the TWT scheduled STA when the Trigger frame contains the AID of the STA in one of its Per User Info fields (see 27.5.3 (UL MU operation)), and can have in the TA field the MAC address of the transmitted BSSI under the conditions defined in 27.5.3.2.3 (Allowed settings of the Trigger frame fields and UMRS Control field)(#7171). Otherwise, the Trigger frame is not intended for the STA. If the Trigger frame contains one or more random access RUs(17/646r4) for which the STA can gain access according to 27.5.5 (UL OFDMA-based random access (UORA)) then the STA can follow the rules defined in 27.14.2 (Power save with UORA) to determine an early TWT SP termination event.