IEEE P802.11  
Wireless LANs

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| Comment resolution for 27.7.4 (Block 3) | | | | |
| Date: 2017-01-05 | | | | |
| 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. |  |  |  |
| Raja Banerjea | Qualcomm Inc. |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGax D1.0 with the following CIDs (13 CIDs):

* 3240, 7403, 7636, 8109, 3248, 3257, 3266, 4176, 4187, 4196, 6753, 9982, 10281

Note: 4847 moved to another document.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Added clarification that covers the schedule of broadcast TWT values from flexible TWT STAs, and found a name for the one bit of broadcast re-schedule (changes highlighted in green)

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** |
| 3240 | Albert Petrick | 186 | 8 | TWT scheduling STA and TWT scheduled STA are described. The text states "Either STA can tear down an established negotiation...." It's not clear if "Either STA" means the scheduling STA and the scheduled STA. | Rewrite sentence for clarity and expand on "Either STA" | Revised –  Agree in principle with the comment that the sentence could be written better to improve clarity. Proposed resolution is to specify that “either STA that is a party to an established wake TBTT agreement.  TGax editor to make the changes shown in 11-17/0297r1 under all headings that include CID 3240. |
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| 7403 | Laurent Cariou | 187 | 14 | The spec currently defines a mode of operation where any STAs (especially STAs using legacy power save mechanisms) can send TWT info frames when going in doze state to indicate the time when they will be back in their original state (awake state). If the peer STA sets Flexible TWT Schedule Support to 1, the time when they will be back can be any time. If the peer STA sets Flexible TWT Schedule Support to 0, the time when they will be back shall coincide with a specific TWT SP. For clarity, we should define a specific section for this mode of operation, as it can be used by STAs operating only with legacy power save modes and not operating with TWT. | Define a specific section and better describe the behavior associated to the use of TWT info frames for STAs without TWT agreements. | Revised –  Agree in principle with the comment. Proposed resolution accounts for the suggested change by separating the subclauses so that the behaviors are selfcontained.  TGax editor to make the changes shown in 11-17/0297r1 under all headings that include CID 7403. |
| 7636 | Liwen Chu | 187 | 12 | This should not be mandatory at the receiving side. | Change the reception of it to be optional | Rejected –  The comment fails to identify a technical issue. Reception of TWT Information frames is mandatory only for STAs that have negotiated, or joined TWT schedules. And it is already optional for the case where these TWT Information frames are sent outside of scheduled TWTs as specified by the Flexible TWT Schedule bit in the HE Capabilities IE. |
| 8109 | Matthew Fischer | 188 | 11 | TWT Information frame use is supposed to allow changes to Broadcast TWT operation, e.g. suspend, resume, skip, but the TWT Info field TWT ID is 3 bits and the TWT IE Broadcast TWT ID field is 8 bits - is there a 3 bit limit on the ID values for broadcast TWT? Even if there were such a limit, the TWT info frame does not distinguish between Broadcast and Individual TWT ID values - one might decide to use the RA of the TWT info frame to identify when the TWT ID is referring to BCAST TWT vs Individual TWT - but none of this is spelled out in the draft. | Either make some explicit rules about the RA and TWT ID field values and a limit on Broadcast TWT ID values in the TWT IE, or add a few bits to the TWT Info field definition to allow differentiation of Broadcast vs Individual TWT in that field | Revised –  Agree in principle that there may be some ambiguity in terms of the listed rules in this subclause. There is no ambiguity in terms of normative behavior since a STA can either negotiate individual TWTs or broadcast TWTs as such it is unambiguous from the AP’s perspective what the behavior is for individual TWTs (where the flow identifier specifies which individual TWT is suspended) and for broadcast TWTs (where reception of a TWT Information frame simply suspends participation in broadcast TWT).  Proposed resolution is to divide the subclause into separate subclauses, one for individual TWT, one for broadcast TWT, and one for Flexible TWT and specify that a bit in the TWT info frame suspends there b-TWTs and flex TWT.  TGax editor to make the changes shown in 11-17/0297r1 under all headings that include CID 8109. |
| 3248 | Albert Petrick | 187 | 23 | Period missing at end of sentence | Add period at the of sentence after "TWT" | Accepted |
| 3257 | Albert Petrick | 187 | 26 | Period missing at end of sentence | Add period at the of sentence after "is 1" | Accepted |
| 3266 | Albert Petrick | 187 | 31 | Period missing at end of sentence | Add period at the of sentence after "TWT" | Accepted |
| 4176 | Albert Petrick | 187 | 35 | Period missing at end of sentence | Add period at the of sentence after "is 0" | Accepted |
| 4187 | Albert Petrick | 187 | 37 | Period missing at end of sentence | Add period at the of sentence after "is 1" | Accepted |
| 4196 | Albert Petrick | 187 | 43 | Period missing at end of sentence | Add period at the of sentence after "session" | Accepted |
| 6753 | John Coffey | 187 | 41 | Spurious hyphenation: "expected to wake-up". | Change to "expected to wake up". | Accepted |
| 9982 | Yuchen Guo | 187 | 46 | 10.43.4 does not exist in this draft | Add implicit TWT operation | Rejected –  Clause 10.43.4 exists in the baseline, and needs no repeating in this amendment:  “IEEE P802.11ax™/D1.0, November 2016  (amendment to IEEE P802.11REVmc™/D8.0  as amended by IEEE P802.11ai™/D10.0,  IEEE P802.11ah™/D9.0,  IEEE P802.11aq™/D3.0,  IEEE P802.11ak™/D2.0,  and IEEE P802.11aj™/D3.0)” |
| 10281 | Yusuke Tanaka | 187 | 23 | No period at the end, and most of the sentences in this list, neither. | As commented. | Revised –  TGax editor: Insert periods at the end of each item in the lists of this subclause. |

**Discussion: *None.***

**27.7.3.4 Negotiation of wake TBTT and listen interval**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 3240):***

Either STA that is a party to an established wake TBTT agreement can tear down the wake TBTT agreement by following the tear down procedure described in 10.44.8 (TWT Teardown).*(#3240)*

* Use of TWT Information frames

**TGax Editor: *Insert new headings and change the paragraphs below of this subclause as follows (#CID 8109, 7403, 6753):***

27.7.4.1 General *(8109, 7403)*

An HE STA can transmit a TWT Information frame to its peer STA during an individual TWT session, broadcast TWT session, or at any time as defined in 27.7.4.2 (TWT information for individual TWT), 27.7.4.3 (TWT information for broadcast TWT), and 27.7.4.2 (TWT information for flexible TWT), respectively.*(#8109, 7403)*

The TWT Information frame shall have the Response Requested subfield equal to 0, the Next TWT Request subfield equal to 0, and one of the following:

* A nonzero value in the Next TWT subfield when the frame is transmitted by a TWT responding STA, a TWT scheduling AP, or by any HE STA to a peer STA that supports TWT.
* The value of the Next TWT shall be selected from existing TWT values for a TWT session if the Flexible TWT Schedule Support field of the peer STA is 0.
* The Next TWT may contain any nonzero value if Flexible TWT Schedule Support field of the peer STA is 1.
* A Next TWT subfield that is present when the frame is transmitted by a TWT requesting STA, a TWT scheduled STA, or any HE STA to a peer STA that supports TWT.
* The Next TWT indicates the TWT at which the TWT session is resumed and shall be selected from existing TWT values for that TWT session if the Flexible TWT Schedule Support field of the peer STA is 0.
* The Next TWT may contain any nonzero value if Flexible TWT Schedule Support field of the peer STA is 1.  
  NOTE—In such case, the TWT requesting STA or TWT scheduled STA or peer STA that transmitted the TWT Information frame preserves the PM mode from the time it sent the TWT Information frame to the time it is expected to wake up*(#6753)*.
* A Next TWT subfield that is not present when the frame is transmitted by a TWT requesting STA or a TWT scheduled STA to indicate suspension of the TWT session.

The TWT Information frame may have the Broadcast Reschedule subfield set to 1 to indicate reschedule of all broadcast TWT sessions and a flexible TWT as defined below. *(#8109, 7403)*

27.7.4.2 TWT information for individual TWT *(#8109, 7403)*

An HE STA may transmit a TWT Information frame to its peer STA during an individual TWT session. The HE STA sets the fields of the TWT Information frame as defined in 27.7.4.2 (General).

A TWT requesting STA that receives a TWT Information frame follows the rules defined in 10.43.4 (Implicit TWT operation). A TWT requesting STA that receives an acknowledgment in response to a TWT Information frame that:

* Does not contain a Next TWT field shall consider that TWT session suspended, and can follow other individual TWT sessions, the procedure in 27.7.3 (Broadcast TWT operation), or the default PS procedure defined in 11.2 (Power management) until the TWT session is resumed.
* Contains a Next TWT field shall consider the corresponding TWT session resumed, starting from the value indicated in the Next TWT field of the transmitted TWT Information frame.

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A TWT requesting STA that transmits a TWT Information frame to a peer STA may go to doze state after receiving the acknowledgment and shall be in the awake state at the specified TWT indicated in the TWT Information frame. A TWT requesting STA that receives a TWT Information frame from a peer STA may go to doze state after transmitting the acknowledgment and shall be in the awake state at the specified TWT indicated in the TWT Information frame. *(#8109, 7403)*

27.7.4.3 TWT information for broadcast TWT *(#8109, 7403)*

An HE STA may transmit a TWT Information frame to its peer STA during a broadcast TWT session. The HE STA sets the fields of the TWT Information frame as defined in 27.7.4.2 (General).

A TWT scheduled STA that receives a TWT Information frame that contains a Broadcast Reschedule subfield equal to 1 follows the rules defined in 27.7.3.3 (Rules for TWT scheduled STA), except that it shall use the Next TWT value contained in the received TWT Information frame. A TWT scheduled STA that receives an acknowledgment in response to a TWT Information frame that contains a BLABLA subfield equal to 1 that:

* Does not contain a Next TWT field shall consider all broadcast TWT sessions suspended, and can follow the default PS procedure defined in 11.2 (Power management) until the TWT session is resumed.
* Contains a Next TWT field shall consider all broadcast TWT sessions resumed, starting from the value indicated in the Next TWT field of the transmitted TWT Information frame.

NOTE**—**A interprets a Broadcast Reschedule subfield equal to 1 in a received lls *(#8109, 7403)*27.7.4.4 TWT information for flexible TWT *(#8109, 7403)*

An HE STA may transmit a TWT Information frame to its peer STA at any time (i.e., without participating in any TWT sessions) if the peer STA has set the Flexible TWT Schedule Support field of the HE Capabilities it transmits. An HE STA may transmit a TWT Information frame to a TWT scheduling AP. The HE STA sets the fields of the TWT Information frame as defined in 27.7.4.2 (General).

A non-AP HE STA that transmits a TWT Information frame with Broadcast Reschedule subfield equal to 1 to a peer STA may go to doze state after receiving the acknowledgment and shall be in the awake state at the specified TWT indicated in the TWT Information frame. A non-AP HE STA that receives a TWT Information frame with Broadcast Reschedule subfield equal to 1 from a peer STA may go to doze state after transmitting the acknowledgment and shall be in the awake state at the specified TWT indicated in the TWT Information frame.

*(#8109, 7403)*

9.4.1.60TWT Information field

**TGax Editor: *Replace “Reserved” subfield with “Broadcast Reschedule” in Figure 9-121c (TWT Information field format) and insert the paragraph below before the last paragraph as follows (#CID 8109, 7403):***

The Broadcast Reschedule subfield is set to 1 by an HE STA to indicate that the TWT Information frame reschedules Broadcast TWTs as defined in 27.4.4 (Use of TWT Information frames). Otherwise, it is set to 0.