IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comment resolution for 27.7.3.4 | | | | |
| Date: 2017-05-01 | | | | |
| 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. |  |  |  |
| Raja Banerjea | Qualcomm Inc. |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGax D1.0 with the following CIDs (11):

* 3076, 5671, 5672, , 8125, 8126, 8145, 8154, 9577, 9981, 4846, 8130

Note: 4846, and 8130 moved from another document. 7635 moved to another document.

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P** | **L** | **Comment** | **Proposed Change** | **Resolution** |
| 3076 | Abhishek Patil | 187 | 5 | There needs to be a time limit up to which a TWT scheduled STA will remaining awake to catch the beacon. A non-AP STA which is power constrained sets up a wake TBTT TWT schedule. The current spec language seems to indicate that the STA will remain awake till it receives the beacons. What if the beacon was lost due to collision? | Specify a time period (in addition to the current language) for which the non-AP STA waits for the beacon. We could use the Nominal Minimum TWT Wake Duration field in TWT element to specify this time. | Revised –  Agree in principle with comment. Proposed resolution accounts fro the suggested change.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 3076. |
| 5671 | Guoqing Li | 186 | 46 | Not all TWT element paramters are reserved. For example, the broadcast ID. Please see page 72, line 35047 which says how to set broadcast ID when the command type is request for braodcast TWT. | Clarify so that it is consistent with section 9.2.2.200 | Revised –  Agre in principle that there is some inconsistency. This subclause defines the negotiation procedure for the wake TBTT and wake listen interval, for which the Broadcast subfield is set to 0. Proposed resolution clarifies this aspect by specifying that Bcast subfield is 0.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 5671. |
| 5672 | Guoqing Li | 186 | 58 | Not all TWT element paramters are reserved. For example, the broadcast ID. Please see page 72, line 35047 which says how to set broadcast ID when the command type is request for braodcast TWT. | Clarify so that it is consistent with section 9.2.2.200 | Revised –  Agre in principle that there is some inconsistency. This subclause defines the negotiation procedure for the wake TBTT and wake listen interval, for which the Broadcast subfield is set to 0. Proposed resolution clarifies this aspect by specifying that Bcast subfield is 0.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 5672. |
|  |  |  |  |  |  |  |
| 8125 | Matthew Fischer | 186 | 44 | Description is missing for value of Target Wake Time field | Add another bullet item as follows: "The value requested for the next wake TBTT in the Target Wake Time field" Also change the text on P69 | Revised –  Agree in principle. Proposed resolution accounts for the suggested change and fixes the inconsistencies (e.g., fixing the copy paste error in the Command table) in the TWT element section so that those parts are inline with the normative behavior that is defined in subclause 27.7.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 8125. |
| 8126 | Matthew Fischer | 186 | 54 | Is it really the wake TBTT or is it the next broadcast TWT SP start time? | Clarify, possibly changing the text as suggested by the comment. | Revised –  Clarified that this portion is related to the wake TBTT and is identified by a setting of the broadcast field equal to 0, and fixed the inconsistencies in the broadcast TWT portion by clarifying joining, withdrawing and terminating the broadcast twts.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 8126. |
| 8145 | Matthew Fischer | 187 | 8 | The teardown process is a bit difficult for bTWT - theTWT teardown action frame contains a flow identifier field which is currently defined as having only 3 bits, but bTWT can have an ID of up to 8 bits in the TWT IE | Either limit the bTWT ID field to 7 bits and in the flow id field of the twt teardown action frame use one bit of the flow field as a broadcast identifier OR do not use the teardown procedure for bTWT teardown, but instead, use command reject in either direction | Revised –  There is no teardown for broadcast TWTs, but rather joining, withdrawing or terminating a broadcast TWT. Proposed resolution clarifies this aspect and fixes some inconsistencies that were introduced during the last comment resolution phase due to the addition of the broadcast TWT ID portion to the spec.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 8145. |
| 8154 | Michael Montemurro | 186 | 33 | The use of listen interval in the contect of TWT is ambiguous because there is already a Listen Interval field defined in the IEEE 802.11 base standard. | Reword the TWT procedure descriptions to use alternaive wording for "listen interval: | Revised –  Agree in principle with the comment. In several places, we use wake interval, so proposal is to use this terminology throughout.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 8154. |
| 9577 | Yonggang Fang | 186 | 48 | The TWT responding STA may not agree the TWT/TBTT proposal from the TWT requesting STAs. Therefore it needs a way for the TWT responding STA (AP) to provide the recommended TWT/TBTT values in the TWT response frame. We may use the similar mechanism defined in 11ah for HE TWT/TBTT negotiation. | Suggest to add the following in the section: A TWT scheduling STA that receives a TWT request frame from a HE STA whose value of the TWT/TBTT Negotiation subfield is 1 may send a TWT response frame that contains the TWT Command of Alternate TWT or TWT Grouping.  If the TWT Command field of TWT scheduling STA's response contains Alternate TWT or TWT Grouping, the TWT requesting STA may send a new TWT request frame for negotiation with a new proposal of TWT/TBTT parameters. | Rejected –  The allocated command set already provides this flexibility in one combination: The STA sends a TWT request with Suggested TWT to which the AP can respond with a TWT response accepting it but including the TWT parameters that the AP deems more reasonable. |
| 9981 | Yuchen Guo | 187 | 8 | 10.44.8 does not exist in this draft | Define TWT Teardown procedure in 11ax | Rejected –  Subclause 10.44.8 is already defined. Please refer to IEEE802.11ah D10.0 from which the 11ax is amended by. |
| 4846 | Alfred Asterjadhi | 183 | 60 | PLease list the possible values of this fields (Wake TBTT and broadcast, and their interpretation) when they are part of the TWT setup prceudre | As in comment. For both these paragraphs. | Revised –  Agree in principle with the comment. Proposed resolution fixes these inconsistencis.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 4846. |
| 8130 | Matthew Fischer | 184 | 54 | The exact meanings of some of the fields in the TWT element are not well described when comparing the cases of Broadcast TWT negotiation vs Broadcast TWT SP announcement. | Clarify the difference between a TWT element that is part of a broadcast TWT negotiation vs a Broadcast TWT announcement, probably need to emphasize the difference in the RA of the MPDU that contains the element plus point out the difference in the meaning of the TWT Wake Interval field for the two cases. (I.e. the TWT Wake Interval is used during negotiation to identify non-AP STA wake times and it is used during Broadcast TWT announcements to indicate the separation between successive Broadcast TWT SP start times. | Revised –  Agree in principle with the comment. Agree in principle. Proposed resolution fixes these inconsistencis.  TGax editor to make the changes shown in 11-17/0687r0 under all headings that include CID 8130. |

**Discussion: *None.***

**TGax Editor: *Change the heading below of this subclause as follows (#CID 8154):***

* Negotiation of wake TBTT and wake*(#8154)* interval

**TGax Editor: *Change the paragraph below as follows (#CID 5671, 8125, 8126, 8154):***

A TWT scheduled STA that intends to operate in power save mode (see 11.2.2.2 (STA Power Management modes)) may transmit a TWT request frame to the TWT scheduling AP that identifies the wake TBTT of the first Beacon frame and the wake interval between subsequent Beacon frames it intends to receive. The TWT request frame shall contain:

* The Wake TBTT Negotiation subfield equal to 1 and the TWT Command field to Suggest TWT or Demand TWT, the Broadcast subfield equal to 0*(#5671, 8126)*, and
* The requested first wake TBTT in the Target Wake Time field*(#8125)*,
* The requested wake interval*(#8154)* between consecutive TBTTs in the TWT Wake Interval Mantissa and TWT Wake Interval Exponent fields.
* All other fields in the TWT element are reserved.

**TGax Editor: *Change the paragraph below as follows (#CID 5671, 5672, 8126):***

A TWT scheduling AP(#6919) that receives a TWT request frame from a STA whose value of the Wake TBTT Negotiation subfield is 1 and Broadcast subfield is 0*(#5671)* shall respond with a TWT response frame that contains either Accept TWT or Reject TWT in the TWT Command field and, in the case of an Accept TWT, it shall also contain:

* The Wake TBTT Negotiation subfield equal to 1, the Broadcast subfield equal to 0*(#5672, 8126)*, and
* The allocated first wake TBTT in the Target Wake Time field, and
* The allocated wake interval*(#8154)* between consecutive TBTTs in the TWT Wake Interval Mantissa and TWT Wake Interval Exponent fields.
* All other fields in the TWT element are reserved.

After successfully completing the negotiation, the TWT scheduled STA may go to doze state until its TSF matches the next negotiated wake TBTT provided that the STA is in power save mode, and no other condition requires the STA to remain awake. The TWT scheduled STA shall be in the awake state to listen to Beacon frames transmitted at negotiated wake TBTTs and shall operate as described in 27.7.3.3 (Rules for TWT scheduled STA).

**TGax Editor: *Change the paragraph below as follows (#CID 3076):***

After receiving the Beacon frame at or after TBTT, the TWT scheduled STA may go to doze state until the next wake TBTT if no other condition requires the STA to remain awake. The TWT scheduled STA may go to doze state after AdjustedMinimumTWTWakeDuration time has elapsed from the TBTT start time if no Beacon frame is received.*(#3076)*Either STA can tear down an established negotiation following the tear down procedure described in 10.44.8 (TWT Teardown).

**9.4.2.200 TWT element**

**TGax Editor: *Change the sentence below as follows (#CID 8154):***

In a TWT element contained in a TWT request that is sent by the scheduled STA to negotiate the wake intervals for Beacon frames that contain a TWT element that indicates a broadcast TWT, the TWT wake interval indicates the value of the wake interval (see 10.44.3.4 (Negotiation of TBTT and wake interval)).*(#8154)*

**27.7.3.1 General**

**TGax Editor: *Change the sentence below as follows (#CID 8154):***

A TWT scheduled STA follows the schedule provided by the TWT scheduling AP(#6919) as described in 27.7.3.3 (Rules for TWT scheduled STA). A TWT scheduled STA can negotiate the wake TBTT and wake*(#8154)* interval for Beacon frames it intends to receive as described in 27.7.3.3 (Rules for TWT scheduled STA).

**TGax Editor: *Change the two occurrences of “Listen Interval” to “Wake Interval” in Figure 27-8 (#CID 8154)***

**9.4.2.200 TWT element**

**TGax Editor: *Change the paragraph below as follows (#CID 8125, 8130):***

The Wake TBTT Negotiation subfield indicates that the STA transmitting the TWT element is indicating a value for the next wake TBTT or the next broadcast TWT in the Target Wake Time field and is indicating a value for a wake interval between Beacon frames, or between broadcast TWTs in the TWT Wake Interval Mantissa and TWT Wake Interval Exponent fields as described in 27.7.3.4 (Negotiation of wake TBTT and listen interval) when the Broadcast subfield is 0 and as described in 27.7.3.2 (General) when the Broadcast subfield is 1. *(#8125, 8130)*

**TGax Editor: *Change the rows of the table below as follows (#CID 8125, 8130):***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| * TWT Setup Command field values | | | | | |
| TWT Setup Command field value | Command name | Description when transmitted by a TWT requesting STA, Wake TBTT Negotiation subfield = 0 | Description when transmitted by a TWT responding STA, Wake TBTT Negotiation subfield = 0 | Description when transmitted by a TWT scheduled STA, Wake TBTT Negotiation subfield = 1 | Description when transmitted by a TWT scheduling AP(#6919), Wake TBTT Negotiation subfield = 1 |
| … |  |  |  |  |  |
| 1 | Suggest TWT | TWT requesting STA includes a set of TWT parameters such that if the requested target wake time value and/or other TWT parameters cannot be accommodated, then the TWT setup might still be accepted. | N/A | TWT scheduled STA includes a set of TWT parameters such that if the requested target wake time value and/or other TWT parameters cannot be accommodated, then the TWT setup might still be accepted.  *(#8125, 8130)* | N/A |
| 2 | Demand TWT | TWT requesting STA includes a set of TWT parameters such that if the requested target wake time value and/or other TWT parameters cannot be accommodated, then the TWT setup will be rejected. | N/A | TWT scheduled STA includes a set of TWT parameters such that if the requested target wake time value and/or other TWT parameters cannot be accommodated, then the TWT setup will be rejected.  *(#8125, 8130)* | N/A |
| … |  |  |  |  |  |
| NOTE—TWT Parameters are: TWT, Nominal Minimum Wake Duration, TWT Wake Interval and TWT Channel subfield values indicated in the element. The Trigger subfield value indicated in the element is also a TWT parameter for an HE STA. | | | | | |

* General

**TGax Editor: *Change the paragraphs below as follows (#CID 8145, 4846, 8130):***

Each broadcast TWT is uniquely identified by the <broadcast TWT ID, MAC address> tuple, where the broadcast TWT ID is the value of the Broadcast TWT ID subfield of a TWT parameter set from the broadcast TWT element (Broadcast field is 1) that describes the broadcast TWT and the MAC address is the address of the TWT scheduling AP and is one of the following:

* The RA of the MMPDU that contains the TWT element if the TWT command value is Suggest or Demand. A TWT scheduled STA may send the MMPDU that contains this TWT element to request joining the broadcast TWT(s) indicated in the TWT parameter set(s), in which case the Wake TBTT Negotiation subfield of the TWT element shall be 1.*(#8145, 4846, 8130)*
* The TA of the MMPDU that contains the TWT element if the TWT command value is Accept, or Alternate. A TWT scheduling AP may send the MMPDU that contain this broadcast TWT element either in response to a request for accepting and allocating the requested broadcast TWT(s) in which case the MMPDU is indidivually addressed, or may send broadcast MMPDUs to schedule the broadcast TWT(s) as defined in 27.7.3.3 (Rules for TWT scheduling AP).*(#8145, 4846, 8130)*

When the TWT command value is Reject, the broadcast TWT is identified by the Broadcast TWT ID subfield and the TA of the MMPDU that contains the broadcast TWT element if the Wake TBTT Negotiation subfield is 0 and by the RA of the MPDU that contains the TWT element if the Wake TBTT Negotiation subfield is 1. A STA may send this MMPDU to:

* Withdraw from the broadcast TWT(s) indicated in the TWT parameter set(s) of the TWT element if the STA is a TWT scheduled STA,
* To terminate the broadcast TWT(s) indicated in the TWT parameter set(s) of the TWT element if the STA is a TWT scheduled AP (see 27.7.3.3 (Rules for TWT scheduled AP)).*(#8145, 4846, 8130)*

**27.7.3.3 Rules for TWT scheduling AP**

**TGax Editor: *Remove the two paragraphs below as follows (#CID 8145, 8130):***

*(#8145, 8130)(#8145, 8130)*