IEEE P802.11
Wireless LANs

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| Comment resolutions for 27.7.3.1 |
| Date: 2018-05-01 |
| 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. |  |  |  |
| Matthew Fischer | Broadcom Ltd. |  |  |  |

Abstract

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

* 11038, 11040, 11872, 13783, 13784, 13789, 11848 (7 CIDs)

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Removed one CID. Rest is unchanged. No technical changes.

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** |
| 11040 | Abhishek Patil | 275.10 | Mixing two features into one figure can cause confusion. Update the figure to only show Broadcast TWT. Further, since Wake TBTT Negotiation is a separate feature, it should be moved into its own section (instead of being a sub-section under Broadcast TWT). | As in comment | Revised –The presence of different features in a figure does not neccessarily cause confusion, especially when the portions of the figure that corresponds to each feature are clearly separated graphically. Agree that TBTT negotiation is a separate feature which is already moved into its own section during the CRs of the last F2F. Proposed resolution is the same. Additionally add to the title that it has also some part of Next TBTT negotiation.TGax editor: Please move subclause 27.7.3.4 (Negotiation of wake TBTT and wake interval) and its contents as a new subclause 27.7.6 (Negotiation of wake TBTT and wake interval).TGax editor to make the changes shown in 11-18/0662r1 under all headings that include CID 11040. |
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| 11872 | Hemanth Sampath | 275.47 | What is the need to differentiate the case where b-TWT element is carried in a broadcast mgmt frame versus an individually addressed mgmt frame to negotiate (or change/terminate)? Keep Wake TBTT operation and corresponding field separate from Broadcast TWT operation. | Delete this paragraph | Rejected –The presence of separate bits in the element ensures that the two functionalities are kept separate, as suggested by the comment. And the need to separate the broadcast TWT element when carried in a broadcast vs. a individually addressed frame is because the broadcast frame delivers the schedule information, while the individually addressed frames provide a mechanism for the STAs to join, leave certan schedules. |
| 13783 | Yanjun Sun | 274.45 | Statement related to Wake TBTT should not be included in section Broadcast TWT. The two procedures are different and should be described in separate section. | Delete sentence describing TWT Schedule STA setting Wake TBTT. | Revised –The sentence is a cross-reference to a procedure that can be used together with broadcast TWT (reflected by the fact that it is an informative statement). However, the reference subclause is wrong. Proposed resolution is to point to the correct subclause that does describe this behavior. Also we propose to use the Negotiation Type field terminology that is adopted in the IEEE802.11ax D2.3 for identifying the different types. TGax editor to make the changes shown in 11-18/0662r1 under all headings that include CID 13783. |
| 13784 | Yanjun Sun | 275.07 | Keep broadcast TWT operation separate from Wake TBTT negotiation | Remove content related to wake TBTT from figure 27-8. Add a new figure in the section on Wake TBTT to describe the operation related to Wake TBTT. Also may be a good idea to have a new figure under 27.7.1 that covers all 3 flavors of TWT (Individual, Broadcast and Wake TBTT). | Revised –The presence of different features in a figure does not neccessarily cause confusion, especially when the portions of the figure that corresponds to each feature are clearly separated graphically. Agree that TBTT negotiation is a separate feature which is already moved into its own section during the CRs of the last F2F. Proposed resolution is the same. Additionally add to the title that it has also some part of Next TBTT negotiation.TGax editor: Please move subclause 27.7.3.4 (Negotiation of wake TBTT and wake interval) and its contents as a new subclause 27.7.6 (Negotiation of wake TBTT and wake interval).TGax editor to make the changes shown in 11-18/0662r1 under all headings that include CID 13784. |
| 13789 | Yanjun Sun | 279.37 | The 1st sentence of the 1st paragraph in (section 27.7.3.2) defines Broadcast TWT. Move this to the beginning of section 27.7.1 since it applies to the entire section. | As in comment | Revised –The sentence refers to the broadcast TWT section as such the correct section should be 27.7.3.1 (Genera), however that subclause has already a statement specifying that the AP may include a broadcast TWT element in the Beacon frame, so technically it is a duplicate behavior. Propose resolution is to switch the normative behavior in 27.7.3.1 to a declarative statement and add a reference to the actual subclause where the normative behavior is defined.TGax editor to make the changes shown in 11-18/0662r1 under all headings that include CID 13789. |
| 11848 | Guoqing Li | 281.60 | An AP cannot demand a STA to be in awake state during a particular period of time because the awake/doze transision should be decided by the STA ultimatley unless this is agreed by the STA, i.e., AP cannot decide STA's power saving operation. Therefore, AP shall not set up unsolicited unannouned TWT schedule. Please add this clarification in the spec. Please also add that "When AP has received rejection from the scheduled or requesting STA of unsolicited TWT setup, the AP shall not initiate any unsolicited TWT with the STA". This means the STA has some unknon-to-the-AP activity that prohibits its automatic availability during unsolicited TWT SP and it is better not to initiate such TWT anymore | An AP cannot demand a STA to be in awake state during a particular period of time because the awake/doze transision should be decided by the STA ultimatley unless this is agreed by the STA, i.e., AP cannot decide STA's power saving operation. Therefore, AP shall not set up unsolicited unannouned TWT schedule. Please add this clarification in the spec. Please also add that "When AP has received rejection from the scheduled or requesting STA of unsolicited TWT setup, the AP shall not initiate any unsolicited TWT with the STA". This means the STA has some unknon-to-the-AP activity that prohibits its automatic availability during unsolicited TWT SP and it is better not to initiate such TWT anymore | Revised –Generally agree with the comment. Proposed resolution is to add similar statements that were added to the individual TWT operation counterpart. TGax editor to make the changes shown in 11-18/0662r1 under all headings that include CID 11848. |

**Discussion: *None.***

* Broadcast TWT operation
* General

A TWT scheduling AP(#6919) is an HE AP with dot11TWTOptionActivated equal to true that sets the Broadcast TWT Support field of the HE Capabilities element it transmits to 1 and that follows the rules in 27.7.3.2 (Rules for TWT scheduling AP), 27.14.2 (Power save with UORA), and 27.14.3 (Opportunistic power save).

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 13789):***

A TWT scheduling AP includes a broadcast TWT element in the Beacon frame as described in 27.7.3.2 (Rules for TWT scheduling AP).*(#13789)* (#7627, #7401)

The TWT scheduling AP(#6919) shall not include the broadcast TWT element in broadcast Probe Response frames unless both of the following conditions are met:

* The AP has dot11FILSOmitReplicateProbeResponses is equal to true(#9659)

The TWT Flow Identifier subfield is set to 2 and the AP has scheduled transmission of a Trigger frame with at least one RU with the AID12 subfield equal to 2045 during the next scheduled TWT SP**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID AA):***

A TWT scheduling AP may include a TWT element with Negotiation Type subfield equal to 3*(#AA)* within an (Re-)Association Response frame or within a TWT setup frame to assign the recipient STA to a broadcast TWT schedule without having received a request from the STA to become a member of the broadcast TWT schedule. (#4767)(#4846)

The TWT scheduling AP shall not include a broadcast TWT element in FILS Discovery frames unless the TWT Flow Identifier subfield is set to 2 and the AP has scheduled transmission of a Trigger frame with at least one RU with the AID12 subfield set to 2045 during the next scheduled TWT SP.(#9958)*(#11347)*

A TWT scheduled STA is an non-AP HE STA that sets the Broadcast TWT Support field of the HE Capabilities element it transmits to 1 and receives a broadcast TWT element transmitted by an HE AP that is a TWT scheduling AP(#6919).(#5662, #7628, #8143)

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 13783):***

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), 27.14.2 (Power save with UORA), and 27.14.3 (Opportunistic power save)(#4843). A TWT scheduled STA can negotiate the wake TBTT and wake interval(#8154) for Beacon frames it intends to receive as described in 27.7.6 (Negotiation of wake TBTT and wake interval) or can join a particular broadcast TWT as described below(#4843).*(#13783)*

An example of broadcast TWT operation is shown in Figure 27-8 (Example of broadcast TWT operation), where the AP is the TWT scheduling AP(#6919) and STA 1 and STA 2 are the TWT scheduled STAs.

**TGax Editor: *Change the title below of this figure as follows (#CID 11040, 13784):***

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| * Example of broadcast TWT operation(#8225) with optional TBTT negotiation*(#11040, 13784)*
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 The TWT scheduling AP includes a broadcast TWT element in the Beacon frame that indicates a broadcast TWT at or after which the AP intends to send Trigger frames, or DL BUs to the TWT scheduled STAs. STA 1 and STA 2 wake to receive the Beacon determine the broadcast TWT. During the trigger-enabled TWT SP the AP sends a Trigger frame to which STA 1 and STA 2 indicate that they are awake during the TWT SP. STA 1 indicates that it is awake by sending a PS-Poll and STA 2 indicates that it is awake by sending a QoS Null frame in response to the Trigger frame STA 1 and STA 2 receive their DL BUs in a subsequent exchange with the AP and go to doze state outside of this TWT SP.(#8153)

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 and is greater than 0 and the MAC address is the address of the TWT scheduling AP. (17/296r1)

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 13783):***

Broadcast TWT schedules are advertised by TWT scheduling APs in frames that carry TWT elements the Negotiation Type subfield equal to 2 as described in 27.7.3.2 (Rules for TWT scheduling AP).*(#13783)* (#4767)(#4846)

Negotiations to join or leave a Broadcast TWT are performed with an exchange of frames that carry TWT elements with the Negotiation Type subfield equal to 3 as described in 27.7.3.3 (Rules for TWT scheduled STA).*(#13783)* (#4767)(#4846)

**TGax Editor: *Insert the paragraph below of this subclause as follows (#CID 11848):***

The TWT scheduling AP may send an unsolicited TWT response with the Trigger subfield equal to 1 to a non-AP HE STA that has set the Broadcast TWT 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 field 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 field of Accept TWT allocates a broadcast TWT schedule to the receiving STA. A STA that receives an unsolicited TWT response with the TWT Command field of Accept TWT may transmit a TWT Teardown frame or a TWT response with TWT Command field set to Reject TWT to withdraw from the unsolicited broadcast TWT schedule.*(#11848)*