IEEE P802.11
Wireless LANs

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| Comment resolutions for 27.7.4 |
| Date: 2018-03-01 |
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Abstract

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

* 12228, 12531, 11041, 11350, 11351, 11352, 11853, 12538, 13792 (9 CIDs)

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Changed document number in the heading and took an AI to rename “Broadcast Reschedule” bit and “reschedule” term. These changes will be present in a subsequent revision as part of an editorial change not related to any of the CIDs.
* Rev 2: Fixed the AI bu renaming the “Broadcast Reschedule” to “All TWT” and also use “resume” instead of “reschedule”. Changes 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** |
| 12228 | kaiying Lv | 106.16 | A definition of the TWT Flow identifier should be given when the Broadcast Reschedule subfield is set to 1. | Add "The TWT Flow identifier subfield is reserved when the Broadcast Reschedule subfield is set to 1" | Revised –Agree in principle. Proposed resolution adds clarification as suggested that the TWT flow identifier is reserved, however that when the mentioned bit is one every TWT is suspended.TGax editor to make the changes shown in 11-18/0371r2 under all headings that include CID 12228. |
| 12531 | Liwen Chu | 282.59 | TWT Information frame is not applicable to broadcast TWT. | Fix the issue mentioned in comment. | Rejected –This CID is related to subclause 27.7.4. The TWT Information frame is applicable to broadcast TWT. This is the case when the broadcast TWT reschedule bit is set to 1 in the frame. As such there is not issue to be fixed. No changes are needed for this comment. |
| 11041 | Abhishek Patil | 284.05 | Broadcast Reschedule = 1 reschedules all B-TWT schedules - this is too broad. AP/STA should have the ability to pause/resume a single B-TWT session. Comment also applies to the procedure described in 27.7.4.3 | As in comment | Rejected –This is easier said than done. Adding the ability to pause/resume a single B-TWT session would require the TWT Information frame to carry the list of the broadcast TWT sessions, which would add parsing complexity and also maintenance of which of the STAs is asking to suspend which session, which would require additional memory and would complicate the scheduler as well. |
| 11350 | Alfred Asterjadhi | 284.34 | The TWT may not be present. See above. Add ", if any is indicated" after "at the specified TWT". Same observation for the broadcast TWT case in the next subclause and for flexible TWT subclause. | As in comment. | Revised –Agree in principle. Proposed resolution adds clarification as suggested.TGax editor to make the changes shown in 11-18/0371r2 under all headings that include CID 11350. |
| 11351 | Alfred Asterjadhi | 284.00 | For TWT Information frame usage in broadcast TWT need to clarify that the TWT SPs are resumed at their pre-scheduled times (at or after the next TWT provided in the TWT Information frame). Also do we need to mention that in this setting (all applies to individually addressed as well?). | As in comment. | Revised –Agree in principle. Proposed resolution adds clarification as suggested. No need to mention for individually addressed because they all are individually addressed.TGax editor to make the changes shown in 11-18/0371r2 under all headings that include CID 11351. |
| 11352 | Alfred Asterjadhi | 283.63 | Are TWT Information frames always individually addressed? | As in comment. | Rejected –Yes. TWT Information frames are Action frames that solicit an immediate response from the intended recipient, as such they must be individually addressed. No changes are needed for this comment. |
| 11853 | Guoqing Li | 284.64 | Since broadcast TWT is meant for multiple STAs, the resumption as indicated by TWT information frame from a particular STA shall select a TWT value from an existing TWT value of the Broadcast TWT session instead of any random TSF value since other STAs in this broadcast TWT are not aware of the suspection/resumption activity from a particular STA and those STA should be able to do the regular TWT operations without any change. | Clarify that when a STA resumes its activity in a broadcast TWT, the Next TWT value shall be selected froman existing TWT values of this Broadcast TWT. | Revised –Agree in principle. Proposed resolution adds clarification as suggested.TGax editor to make the changes shown in 11-18/0371r2 under all headings that include CID 11853. |
| 12538 | Liwen Chu | 284.09 | The behavior of TWT requesting STA sending TWT Information is undefined. Also it is dangeous for a TWT requesting STA to send TWT Information with new value in Next TWT | Fix the issue mentioned in comment. | Revised –The behavior defined in this subclause is also for the TWT requesting STA. Please refer to the description of a TWT requesting STA that receives an acknowledgment in response to a TWT information frame. To make it clearer we propose to add “transmitted” so that the act of transmission is highlighted. Also it is not clear what is dangerous for a TWT requesting STA sending a TWT Information frame with a value in the Next TWT. This field simply indicates when the STA plans to resume the suspended TWT session. TGax editor to make the changes shown in 11-18/0371r2 under all headings that include CID 12538. |
| 13792 | Yanjun Sun | 282.49 | Add text to provide reference to the section where Flexible TWT Schedule Support subfield is described (several occurance in this section) | Provide reference to HE Cap (9.4.2.237.2 and Table 9-262z) where Flexible TWT Schedule Supported subfield is described. | Revised –Agree in principle. Proposed resolution adds clarification that the field is obtained from the HE capabilities element received from the peer STA.TGax editor to make the changes shown in 11-18/0371r2 under all headings that include CID 13792. |

**Discussion: *None.***

* Use of TWT Information frames
* General

An HE STA may 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 27.7.4.4 (TWT information for flexible TWT), respectively.(#8109, #7403)

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 13792):***

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(#6919), 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 in the HE Capabilities element received from the peer STA is 0.*(#13792)*
* The Next TWT may contain any nonzero value if Flexible TWT Schedule Support field in the HE Capabilities element received from the peer STA is 1.*(#13792)*
* 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 earliest 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 in the HE Capabilities element received from the peer STA is 0.*(#13792)*
* The Next TWT may contain any nonzero value if Flexible TWT Schedule Support field in the HE Capabilities element received from the peer STA is 1.*(#13792)*
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.

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 12228, 11351, 11853):***

The TWT Information frame may have the *All TWT*  subfield set to 1 to indicate suspend, or resume all broadcast TWT sessions (see 27.7.4.3 (TWT information for broadcast TWT)), all individual TWT sessions (see 27.7.4.2 (TWT information for individual TWT), and additionally provide flexible TWTs (see 27.7.4.4 (TWT information for flexible TWT)).*(#12228, 11351, 11853)* (#8109, #7403)

* TWT information for individual TWT

An HE STA that has an individual TWT agreement may transmit a TWT Information frame to the STA with which it has an agreement. The HE STA sets the fields of the TWT Information frame as defined in Table 27.7.4.1 (General).(#8109, #7403)

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 12228, 12538):***

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 transmitted*(#12538)* 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.(#8109, #7403)
* Contains a Next TWT field shall resume the corresponding TWT session, starting from the value indicated in the Next TWT field of the transmitted TWT Information frame.

NOTE —The TWT Flow Identifier, together with the MAC addresses of the TWT requesting STA and TWT Responding STA identifies the TWT agreement for which the TWT Information frame is sent (see 10.43.1 (TWT overview)).

If the TWT Information frame contains a All TWT subfield equal to 1 then the above rules apply to all individual TWT sessions, except that the resumptions of the respective TWTs occur not earlier than the Next TWT value contained in the TWT Information frame.*(#12228)*

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11350):***

A TWT requesting STA that is in PS mode and that transmits a TWT Information frame to a peer STA may transition to doze state after receiving the acknowledgment even if it has previously transmitted a PS-Poll or U-APSD trigger and has not yet received the expected frames from the AP in response(#4846) and shall resume TWT operation for the corresponding TWT session at the specified TWT indicated (if any) in the TWT Information frame. A TWT requesting STA that is in PS mode and that receives a TWT Information frame from a peer STA may go to doze state after transmitting the acknowledgment even if it has previously transmitted a PS-Poll or U-APSD trigger and has not yet received the expected frames from the AP in response(#4846) and shall resume TWT operation for the corresponding TWT session at the specified TWT indicated (if any) in the TWT Information frame.*(#11350)* (#8109, #7403)

* TWT information for broadcast TWT

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. 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. The HE STA sets the fields of the TWT Information frame as defined in 27.7.4.1 (General).

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11351, 11853):***

A TWT scheduled STA that receives a TWT Information frame that contains a All TWT subfield equal to 1 follows the rules defined in 27.7.3.3 (Rules for TWT scheduled STA), except that the TWT scheduled STA shall consider all the broadcast TWTs as resumed in their respective broadcast TWTs, which occur not earlier thanthe Next TWT value contained in the received TWT Information frame*(#11351, 11853)*.

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 12538, 11351, 11853):***

A TWT scheduled STA that receives an acknowledgment in response to a transmitted*(#12538)* TWT Information frame that contains a All TWT subfield equal to 1 and:

* 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 broadcast TWT sessions are resumed.
* Does contain a Next TWT field shall resume all broadcast TWT sessions in their respective broadcast TWT schedules, which occur not earlier than the Next TWT value contained in the transmitted TWT Information frame.*(#11351, 11853)*

NOTE—TWT suspension and resumption as indicated by a TWT Information frame with the All TWT subfield equal to 1 applies to all broadcast TWT sessions of the TWT scheduling AP.(#8109, #7403)(#4767)(#4846)

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11350):***

A TWT scheduled STA that is in PS mode and that transmits a TWT Information frame to a peer STA may transition to doze state after receiving the acknowledgment, even if it has previously transmitted a PS-Poll or U-APSD trigger and has not yet received the expected frames from the TWT scheduling AP in response and shall resume TWT operation for the corresponding TWT session at the specified TWT indicated (if any) in the TWT Information frame. A TWT scheduled STA that is in PS mode and that receives a TWT Information frame from a TWT scheduling AP may transition to doze state after transmitting the acknowledgment, even if it has previously transmitted a PS-Poll or U-APSD trigger and has not yet received the expected frames from the TWT scheduling AP in response and shall resume TWT operation for the corresponding TWT session at the specified TWT indicated (if any) in the TWT Information frame.*(#11350)* (#4767)(#4846)

* TWT information for flexible TWT

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11351, 11853):***

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 to 1. 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 27.7.4.1 (General).

NOTE—When the TWT Information frame has the All TWT field equal to 1 then the TWTs are resumed as described in 27.7.4.2 (TWT information for individual TWTs) and 27.7.4.3 (TWT information for broadcast TWTs).*(#11351, 11853)*

A non-AP HE STA(#6256) that transmits a TWT Information frame with All TWT 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 All TWT 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)

**9.4.1.60 TWT Information field**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 12228):***

The TWT Flow Identifier subfield contains the TWT flow identifier for which TWT information is requested or being provided. The TWT Flow Identifier subfield is reserved when the All TWT subfield is 1.*(#12228)*

**TGax Editor: *Change “Broadcast Reschedule” to “All TWT” throughout the draft (#CID 12228).***