### IEEE P802.11 Wireless LANs

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| **REVme CR for assigned CIDs on TWT** | | | | |
| Date: 2024-04-16 | | | | |
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Abstract

This document contains proposed resolutions for several SA comments on REVme (3 CIDs):

* 7083, 7084, 7085

**Changes to be done w.r.t. D5.0 of REVme.**

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Incorporated suggestions and addressed comments received during the presentation of R0. Changes are highlighted.
* Rev 2: Incorporated suggestions on the fly. Changes are highlighted.

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 REVme Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the REVme Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***REVme Editor: Editing instructions preceded by “REVme Editor” are instructions to the REVme editor to modify existing material in the REVme draft. As a result of adopting the changes, the REVme editor will execute the instructions rather than copy them to the REVme Draft.***

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| **CID** | **Commenter** | **Clause** | **Comment** | **Proposed Change** | **Proposed Resolution** |
| 7083 | Asterjadhi, Alfred | 26.8.3.2 | Since the TWT contains a partial TSF value it is possible that when the STA schedules for transmission the frame the TWT value might refer to a time that has actually passed when the frame is actually transmitted (16 bit rotation happens between the queueing and actual transmission). I think this may be an issue for different functionalities that are relying on partial TSFs and intend to signal a future value. | Please fix the issue for TWT field in B-TWT, and also check the cases of STACK, TACK, TSPEC, TWT Information frame, etc. Refer to 11-23/2155 for an example resolution | Revised –  Agree in principle with the comment. Proposed resolution clarifies the wording on the AP side behavior and addresses the ambiguity at the STA side by adding a note and declarative descriptions regarding how to obtain the subsequent TWTs based on the TWT and TWT wake interval fields.  Went over STACK, TACK, TSPEC, and TWT INFORMATION frames and add a similar note wherever applicable. This is aligned with the proposal in 11-23/2155r1, which was also discussed.  TGme editor: please implement changes as shown in 11-24/0705r2 under all headings that include CID 7083. |
| 7084 | Asterjadhi, Alfred | 26.8.3.3 | Similar comment to the AP side, now on the STA side. If the obtained TWT from a TWT parameter set is pointing to a value in the past (as opposed to the future) then this is because the frame containing the TWT field has been waiting in the queue for enough time to cause the partial TSF value rotation. Hence the STA needs to ensure that the correct value is determined (i.e., in the future rather than the past). | Clarify that if the obtained TWT from frames that contain partial TWT information is referring to the past then the actual value is the one that is obtained by assuming a 12 bit rotation (i.e., MSB of the main TWT is increased by one). Check that this issue is fixed for all fields that contain a future time in the format of a partial TSF (e.g., TACT, STACK, TWT infor, TSPECT, etc). Refer to 11-23/2155 for an example resolution. | Revised –  Agree in principle with the comment. Proposed resolution clarifies the wording on the AP side behavior and addresses the ambiguity at the STA side by adding a note and declarative descriptions regarding how to obtain the subsequent TWTs based on the TWT and TWT wake interval fields.  Went over STACK, TACK, TSPEC, and TWT INFORMATION frames and add a similar note wherever applicable. This is aligned with the proposal in 11-23/2155r1, which was also discussed.  TGme editor: please implement changes as shown in 11-24/0705r2 under all headings that include CID 7084. |
| 7085 | Asterjadhi, Alfred | 26.8.3 | Need to specify how a sub 1 TU schedule is maintained and advertised. This would help in scenarios where a sub 1 TU resolution is needed | As in comment. | Rejected –  The commenter withdraws the comment. |

### Discussion: *None.*

**26.8.3.2 Rules for TWT scheduling AP**

**REme Editor: *Please change the paragraphs of the subclause below (#CID 7083, 7084):***

The TWT scheduling AP shall set the Target Wake Time field to TSFRef [10:25], where TSFRef corresponds to a TWT scheduled for this TWT parameter set that will occur after the AP has queued for transmission the frame that contains the TWT element. The TSF timer at which that TWT is scheduled has bits 0 to 9 equal to 0 and bits 26 to 63 equal to the same value as the respective bits in the current TSF timer.

The TWT scheduling AP shall include a nonzero value for the TWT wake interval in the TWT Wake Interval Exponent and TWT Wake Interval Mantissa fields for a periodic TWT and a zero value for an aperiodic TWT. The TWT wake interval shall be a multiple of 1 TU.

**26.8.3 Broadcast TWT operation**

**26.8.3.1 General**

**REme Editor: *Please change the paragraphs of the subclause below (#CID 7083, 7084):***

A non-AP HE STA shall obtain TWT parameter values from the most recently received TWT element carried in a Beacon, Probe Response, or (Re)Association Response frame from its associated AP, unless the non-AP HE STA is associated with an AP corresponding to a nontransmitted BSSID of a multiple BSSID set. In this case, it shall follow the rules in 11.1.3.8.4 (Inheritance of element values) to determine the TWT parameter values.

The non-AP HE STA determines the start time of subsequent TWTs of a TWT parameter set from the Target Wake Time field of the TWT parameter set contained in the received TWT element, the current TSF timer, and the TWT wake interval (see 26.8.3.2).NOTE—The Target Wake Time field carries only B10:B25 of the relevant target TSF time, and changes in B26:B63 of the corresponding TSF timer are not explicitly communicated to the receiving STA. Hence, the STA must consider when setting up a broadcast TWT schedule the rollover of B26:B63 of the target TSF time that might happen at the receiving STA during the lifetime of the broadcast TWT schedule (i.e., resulting from the Target Wake Time field and the Broadcast TWT Persistence field).

**9.8.4.2 STACK frame format**

**REme Editor: *Please change the paragraphs of the subclause below (#CID 7083, 7084):***

If the Next TWT Info Present subfield in the Frame Control field is equal to 1 and the Flow Control subfield of the Frame Control field is equal to 0, then the Tetrapartial Timestamp/Next TWT Info/Suspend Duration field contains the value of the 4 least significant octets of the TSF timer for the next TWT logically ANDed with the value 0xFFFFFFF8 and then added to the value of the TWT flow identifier that corresponds to that next TWT value.

NOTE—The Next TWT Info/Suspension Duration field carries only a portion of the target TSF time, and changes in the most significant octets of the corresponding target TSF time are not communicated to the receiving STA. Hence, the receiving STA must consider and account for a rollover of the corresponding most significant octets of the target TSF time that might happen at the receiving STA.

**9.4.2.28 TSPEC element**

**REme Editor: *Please change the paragraphs of the subclause below (#CID 7083, 7084):***

The Service Start Time field contains an unsigned integer that specifies the time, expressed in microseconds, when the first scheduled SP starts. The service start time indicates to the AP the time when a STA first expects to be ready to send frames and a power saving STA needs to be awake to receive frames. This might help the AP to schedule service so that the MSDUs encounter small delays in the MAC and help the power saving STAs to reduce power consumption. The field represents the four lower order octets of the TSF timer at the start of the SP. If APSD and Schedule subfields are 0, this field is also set to 0 (unspecified).

NOTE—The Service Start Time field carries only a portion of the target TSF time, and changes in the most significant octets of the corresponding target TSF time are not communicated to the receiving STA. Hence, the receiving STA must consider and account for a rollover of the corresponding most significant octets of the target TSF time that might happen at the receiving STA.

**9.4.1.58 TWT Information field**

**REme Editor: *Please change the paragraphs of the subclause below (#CID 7083, 7084):***

The Next TWT subfield is of a variable size as determined by the Next TWT Subfield Size subfield value according to Table 9-112 (Next TWT Subfield Size subfield encoding). The value contained in the Next TWT subfield is the least significant portion of the TSF at the next TWT for the TWT specified by the TWT Flow Identifier subfield.

NOTE—The Next TWT subfield might carry only a portion of the target TSF time, and changes in the most significant octets of the corresponding target TSF time are not communicated to the receiving STA. Hence, the receiving STA must consider and account for a rollover of the corresponding most significant octets of the target TSF time that might happen at the receiving STA.