IEEE P802.11
Wireless LANs

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| Comment resolutions for miscellaneous CIDs – Part 1 |
| Date: 2018-11-01 |
| 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 |
| Abhishek Patil | Qualcomm Inc. |  |  |  |
| George Cherian | Qualcomm Inc. |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGax D3.0 with the following CIDs (11 CIDs):

* 15002, 15036, 15044, 15163, 15903, 16472, 16737, 16490, 16120, 15007,
* 17111

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Included changes that were discussed during the presentation. Changes highlighted in green.
* Rev 2: Minor editorial in this color.

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** |
| 15002 | Abhishek Patil | 39.27 | Broadcast TWT one of the main features introduced in 11ax and the term is frequently used thru out the spec. Would be good to provide a definition of the term in clause 3.2 | add a definition for broadcast TWT | Revised –Agree in principle with the comment. Proposed resolution adds the definition as suggested.TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 15002. |
| 15036 | Abhishek Patil | 168.44 | Does TWT Required subfield = 1 mean a STA is also required to setup Wake TBTT SP with the AP? | Please clarify | Revised –The TWT Required subfield is set to 1 to indicate requirement on operating in the role of either TWT requesting STA (described in 27.7.2 (Individual TWT agreements)) or in the role of a TWT scheduled STA (described in 27.7.3 (Broadcast TWT operation). Wake TBTT is described in 27.7.6 (Negotiation of wake TBTT and wake interval) which is an independent subclause part. To make this clearer the proposed resolution is to replace “, as described in” with “by following the rules defined in”TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 15036. |
| 15044 | Abhishek Patil | 187.18 | TWT Information frame can be sent any time if both sides support flexible TWT (see 27.7.4.4). Baseline spec (802.11ah 2016 pg 212, section 9.6.25.12) indicates that this frame can only be exchanged when there is existing TWT agreement. | Section 9.6.25.12 in baseline spec needs to be updated to indicate that this frame can be sent even when there is no TWT agreement. | Revised –Agree in principle with the comment. Proposed resolution amends baseline to indicate that it can be sent to another STA that has indicated support of its reception.TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 15044. |
| 15163 | Alfred Asterjadhi | 214.62 | This really is not a subtype value. The all ONES is a setting of the A-Control field that indicates that padding is provided. The value 15 can still be used in the future. Make sure we do allow for it to be used. | As in comment | Revised –Agree in principle with the comment. Proposed resolution is to specify that Control ID of 15 is used as ONES for HE STAs. Next generation STAs can have enhanced functionalities as appropriate in which case the enhancements can be done.TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 15163. |
| 15903 | Liwen Chu | 215.15 | Reception of Control field with Control ID 15 can be treated same as other reserved Control ID: the receiver will discard the remainder. | Delte the paragraph or generalize it. | Revised –Agree in principle with the comment. Proposed resolution is to generalize the discard rule for both cases, ONES and reserved and/or unsupported Control IDs..TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 15903. |
| 16472 | Ming Gan | 118.15 | The TWT Flow Identifier subfiled in Fig 9-121c is also used for Broadcast TWT, so it is not aligned with that in TWT element. | Change "TWT Flow Identifier" to "TWT Flow Identifier/Broadcast TWT Recommendation" Do the same change for "TWT Flow Identifier subfield" in P118L25, P118L26 and other places where it is related to Broadcast TWT | Revised –The proposed resolution provided to CID 15026 in 11-18/1465r1 solves this issue by separating the fields into individual TWT parameter set (where TWT Flow Identifier resides) and broadcast TWT parameter set (where Broadcast TWT Recommendation resides). As such the functionalities are clearly separated as the TWT Flow Identifier functionality herein only refers to its use in individual TWT sessions. Proposed resolution is the same as that of CID 15026 which addressed this issue.***Note to TGax Editor: The changes below already appear in D3.2, as such no further changes are needed for the resolution of this CID.***TGax editor to make the changes shown in 11-18/1465r2 under all headings that include CID 15026. |
| 16737 | SAI SHANKAR NANDAGOPALAN | 148.39 | Use of TWT information frames. It is not mandated as part of certification in certification body of 802.11ax program and hence request this bit of supported or not supported to be included in HE MAC capabilities | Use one of the reserved bits b45 to b47 to indicate that | Rejected –TWT Informaiton frames are a subpart of the TWT operation procedure, and while its use may not be tested as part of a certification body, its nontestability would not bring any interop issues since the STA that ignores the instructions in the TWT information frame would take a performance hit because the transmitting STA will not be there for the exchange.  |
| 16490 | Naveen Kakani | 216.00 | Not sure if this is correct: If an A-MPDU contains multiple QoS Control fields, then bits 4 of the QoS Control fields shall beidentical and bits 8-15 of these QoS Control fields that have the same TID shall be identicalA-MPDU has multiple MPDUs and each MPDU has QoS Control field. | Change the text to: In an A-MPDU, the QoS Control Field carried in each MPDU shall have the same value for bit4, and for MPDUs that have the same value for the TID sub-field in QoS Control, shall have the same value for bits 8 to 15 in QoS Control Field. | Revised –The proposed change seems to be conceptually identical with what the current specification is saying. Perhaps the confusion comes from the use of identical. Proposed resolution is to clarify the language a little bit more so that it does not leave room to ambiguity. TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 16490. |
| 16120 | Mark RISON |  | It is not clear what the value of transmission of HE MU PPDUs by a non-AP STA is | Add a NOTE in Clause 28 saying (per CID 12627's resolution) "Transmission of HE MU PPDUs from a non-AP STA has the appreciable value that, compared to an HE (ER) SU and ER SU PPDU, the HE MU PPDU has an HE-SIG-B field that contains additional information (most importantly the identifier of the transmitter or receiver) that can be used by the recipient of the HE MU PPDU to determine the transmitter of the PPDU even in those cases where the Data field of the PPDU is not received. This allows the originator of persistently failing PPDUs to be identified." | Rejected –The comment fails to identify a technical issue. The spec already contains a note that specifies that an HE MU PPDU sent by a STA contains the transmit identifier. However, since the spec is not defining rules on when and how to use this HE MU PPDU the note also specifies that its use is out of scope of the standard. Please note that the example in the proposed change is one example of its use but is not limited to it. |
| 15007 | Abhishek Patil | 71.26 | Control ID 15 is not reserved. Table 9-18a should have an entry for ID 15 (ONES). The spec should have a section to specify the expected behavior. See last row of Table 10-8a. | Add a separate entry for Control ID 15 for ONES and a new subsection 9.2.4.6a.8 to cover the details for ONES | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested changes and adds 10.9 as the subclause that covers its details.TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 15007. |
| 17111 | yujin noh | 71.26 | mismatch between Table 10-8a and Table 9-18a. Add ONES to the case where Control ID value equal to 16 |  | Revised –Agree in principle with the comment. Proposed resolution is to add the Control ID value 15 to the table.TGax editor to make the changes shown in 11-18/1473r2 under all headings that include CID 17111. |

**Discussion: *None.***

**3.2 Definitions specific to IEEE 802.11**

**TGax Editor: *Insert the definition below as follows (#CID 15002):***

**broadcast target wake time (TWT):** A specific time or set of times broadcasted by an access point (AP) to multiple non-AP stations (non-AP STAs) to wake in order to exchange frames with the broadcasting AP*(#15002)*

**9.4.2.238 HE Operation element**

**TGax Editor: *Change the paragraph below as follows (#CID 15036):***

The TWT Required subfield is set to 1 to indicate that the AP requires its associated non-AP HE STAs that have declared support for TWT, by setting any one of TWT Requester Support or TWT Responder Support or Broadcast TWT Support subfield in HE Capabilities element that it transmits to 1, to operate in the role of either TWT requesting STA, by following the rules defined in 27.7.2 (Individual TWT agreements), or TWT scheduled STA, by following the rules defined in 27.7.3 (Broadcast TWT operation) and set to 0 otherwise.*(#15036)*

**9.6.24.12 TWT Information frame format**

**TGax Editor: *Change the paragraph below as follows (#CID 15044):***

The TWT Information frame is an Action frame of category Unprotected S1G. It is sent by a STA to request or deliver information about a TWT and is transmitted by either STA of an existing TWT agreement or is transmitted by a STA to a peer STA that has indicated support of its reception. The Action field of the TWT Information frame contains the information shown in Table 9-504 (TWT Information frame Action field format(11ah)).*(#15044)*

* HT Control field operation

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| * Conditions for including Control subfield variants
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| Control subfield variant | Condition |
| TRS | The transmitting STA expects an HE TB PPDU that follows the TRS information as described in 27.5.3.2 (Rules for soliciting UL MU frames) and the recipient STA has set the TRS Support subfield in the HE MAC Capabilities Information field of the HE Capabilities elements it transmits to 1. |
| OM | The transmitting STA changes its operating mode, as described in 27.8 (Operating mode indication) and the recipient STA has set the OM Control Support subfield in the HE MAC Capabilities Information field of the HE Capabilities elements it transmits to 1. |
| HLA | The transmitting STA follows the HE link adaptation procedure, as described in 27.13 (Link adaptation using the HLA Control subfield) and the recipient STA has set the HE Link Adaptation Support subfield in the HE MAC Capabilities Information field of the HE Capabilities elements it transmits to a nonzero value. |
| BSR | The transmitting STA follows the corresponding buffer status report procedure, as described in 27.5.3.6 (HE buffer status feedback operation for UL MU) and the recipient STA has set the BSR Support subfield in the HE MAC Capabilities Information field of the HE Capabilities elements it transmits to 1. |
| UPH | The transmitting STA follows the UL MU operation procedure, as described in 27.5.3.3 (STA behavior for UL MU operation). |
| BQR | The transmitting STA follows the bandwidth query report procedure, as described in 27.5.2 (HE bandwidth query report operation for MU) and the recipient STA has set the BQR Support subfield in the HE MAC Capabilities Information field of the HE Capabilities elements it transmits to 1. |
| CAS | The transmitting STA follows either:* The reverse direction protocol procedure described in 10.28 (Reverse Direction Protocol) and the recipient STA has set the RD Responder of the HT Extended Capabilities field in the HT Capabilities elements it transmits to 1, or
* The SRP procedure described in 27.9.3 (SRP-based spatial reuse operation) and the recipient STA has set the SR Responder subfield of the HE MAC Capabilities Information field of the HE Capabilities elements it transmits to 1.
 |
| ONES | The transmitting STA includes an A-Control field that contains a Control subfield with Control ID subfield equal to 15 and Control Information subfield equal to all 1s and whose content can be ignored by the HE recipient STA. |

**TGax Editor: *Change the paragraphs below as follows (#CID 15163, 15903, 15007, 17111):***

An HE STA that transmits a frame containing an A-Control subfield shall include at least one Control subfield in the A-Control subfield and the Control subfields included shall be supported by the receiving STAs, except when the Control ID subfield is equal to 15.*(#15163, 15903, 15007, 17111)*

An HE STA that receives an A-Control subfield shall ignore a Control field with a Control ID subfield value that is not recognized or not supported by the STA and shall ignore the remainder of the A-Control field that follows the Control ID subfield that is not recognized or not supported by the STA. If more than one Control subfield is present in an A-Control subfield, the Control subfields shall not have the same Control ID value.

An HE STA that receives a Control subfield with Control ID subfield equal to 15 shall ignore the remainder of the A-Control field*(#15163, 15903, 15007, 17111)*

* HE variant(#17004)

The Control ID subfield indicates the type of information carried in the Control Information subfield. The length of the Control Information subfield is fixed for each value of the Control ID subfield that is not reserved. The values of the Control ID subfield and the associated length of the Control Information subfield are defined in Table 9-22a (Control ID subfield values).

**TGax Editor: *Change the table below as follows (#CID 15163, 15903, 15007, 17111):***

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| * Control ID subfield values
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| Control ID value | Meaning | Length of the Control Information subfield (bits) | Content of the Control Information subfield |
| 0 | Triggered response scheduling (TRS) | 26 | See 9.2.4.6a.1 (TRS Control) |
| 1 | Operating mode (OM) | 12 | See 9.2.4.6a.2 (OM Control) |
| 2 | HE link adaptation (HLA) | 26 | See 9.2.4.6a.3 (HLA Control) |
| 3 | Buffer status report (BSR) | 26 | See 9.2.4.6a.4 (BSR Control) |
| 4 | UL power headroom (UPH) | 8 | See 9.2.4.6a.5 (UPH Control) |
| 5 | Bandwidth query report (BQR) | 10 | See 9.2.4.6a.6 (BQR Control) |
| 6 | Command and status (CAS) | 8 | See 9.2.4.6a.7 (CAS Control)) |
| 7-14 | Reserved |  |  |
| 15 | ONES | 26 | See 10.8 (HT Control field operation) *(#15163, 15903, 15007, 17111)* |

* A-MPDU contents

**TGax Editor: *Change the paragraph below as follows (#CID 16490):***

~~When~~ If an A-MPDU contains multiple QoS Control fields, then bit~~s~~ 4 of all QoS Control fields shall have the same value and bits 8–15 of the~~se~~ QoS Control fields that have the same TID shall have the same value. *(#16490)*

**27.15.2 PPDU format selection**

A non-AP HE STA shall not transmit an HE MU PPDU with an RU not occupying the entire PPDU band-width to a peer STA unless it has received from the peer STA an HE Capabilities element with the Rx Partial BW SU Using HE MU PPDU From Non-AP STA subfield(#16137) in the HE PHY Capabilities Information field equal to 1.

NOTE—A non-AP STA transmitting an HE MU PPDU sets the TXVECTOR parameter UPLINK\_FLAG to 1 if the PPDU is sent to the AP and to 0 if the PPDU is sent to a single TDLS STA (see 27.11.2 (UPLINK\_FLAG)). The HE MU PPDU format enables the non-AP STA to include its AID (i.e., transmitter's AID if the UPLINK\_FLAG is 1 and the receiver's AID if the UPLINK\_FLAG is 0) in the PHY header of the PPDU and its use is out of scope of the standard.

An HE STA shall not transmit an HE MU PPDU with an RU occupying the entire PPDU bandwidth and a compressed HE-SIG-B to a peer STA unless the HE STA has received from the peer STA an HE Capabilities element with the Rx Full BW SU Using HE MU PPDU With Compressed SIGB subfield in the HE PHY Capabilities Information field equal to 1.

**27.5.3.4 A-MPDU contents in an HE TB PPDU**

**TGax Editor: *Change the paragraph below as follows (#CID 15163, 15903, 15007, 17111):***

A non-AP STA shall not include a Control ID subfield equal to 15 in the HE variant HT Control field MPDUs contained in an HE TB PPDU.*(#15163, 15903, 15007, 17111)*

The non-AP STA shall include an HE variant HT Control field containing the UPH Control subfield in the MPDUs carried in the A-MPDU of the HE TB PPDU unless one of the following apply:

* The remaining space in the A-MPDU, after inclusion of solicited MPDUs that cannot contain an HE variant HT Control field, is not sufficient to contain MPDU(s) that contain an HE variant HT Control field.

The non-AP STA(#16592) includes other Control fields in the HE variant HT Control field and the available space in the HE variant HT Control field is not sufficient to contain an additional UPH Control subfield.