IEEE P802.11
Wireless LANs

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| Comment resolutions for subclause 9.2.4 |
| Date: 2018-11-01 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D3.0 with the following CIDs (10 CIDs):

* 15861, 15862, 15960, 15963, 16232, 16366, 16389, 16911, 16912, 16077

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Fixes the bug identified with the UV encoding rounding of the queue size value. Other minor editorials (highlighted 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** |
| 15861 | Liwen Chu | 68.34 | the buffer status when UV=0 is not defined. | fix the the bug. | Revised –Agree in principle that the paragraph is not very clear. Proposed resolution is to clearly add the UV equal to 0 case in the spec text.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 15861. |
| 15862 | Liwen Chu | 68.51 | It seems the value of 2 147 328 is not right. | fix the the bug. | Rejected –The value is obtained as 148 480 + 61\*32 768, which is equal to 2 147 328. The values 62 and 63 are not used due to the SF value being 3, i.e., the 254 and 255 values that have a meaning of greater than 2 147 328 and unknown, respectively. Hence, the value is correct. |
| 15960 | Mark RISON | 68.45 | "When SF is equal to 3, the actual queue size minus 148,480 is rounded up to the nearest 32,768 octets and placed into the UV subfield." is not correct. The value is divided by 32768 before it is placed in the UV subfield | Insert ", divided by 32 768," after "octets" in the cited text and make the same change for the two bullets above except the divisor is 256 for the first and 2048 for the second | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested changes.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 15960. |
| 15963 | Mark RISON | 68.15 | It goes "The queue size value,QS, for a non-AP HE STA transmitting the Queue Size subfield to an HE AP is calculated as follows:" then gives the rules twice, neither clearly! The rules should be given on the transmitter in terms of equations (not text) of the form SF =IF(QS<1024,0,IF(QS<17408,1,IF(QS<148480,2,3))),UV = CEIL(IF(QS<=1008,QS/16,IF(QS<=17152,(QS-1024)/256,IF(QS<=146432,(QS-17408)/2048,IF(QS<=2147328,(QS-148480)/32768,62))))),and Equation (9-0a) should be restricted to the case where the Queue Size field value is <254. The "QS is calculated" immediately following the "If transmitted by a non-AP HE STA to an HE AP" is confusing as it suggests the calculation is made by the non-AP STA, but for the purposes of E9-0a the calculation is the one made by the AP | As it says in the comment | Revised –Agree in principle with the comment. Proposed resolution clarifies that the equation is from the AP’s perspective (RX) and the rule for calculating the QS is from STA’s perspective (TX).TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 15963. |
| 16232 | Mark RISON | 67.43 | " The Queue Size subfield is present inQoS Data and QoS Null frames sent by non-AP STAs with bit 4 of the QoS Control field equal to 1." -- the insertion of "and QoS Null" breaks existing non-HE implementations | Before "QoS Null" insert "(for HE STAs) " | Revised –Agree in principle with the comment. Proposed resolution is to separate the functionalities into separate subclauses so that there is no confusion.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 16232. |
| 16366 | Mark RISON | 80.09 | HE Compressed Beamforming And CQI frames might be 11454 octets in size, even if the receiver doesn't normally support that MPDU size | Add a NOTE to Table 9-19 to say that the maximum MPDU size might be greater than indicated in the VHT Capabilities Information field in the case of HE Compressed Beamforming And CQI frames | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested changes.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 16366. |
| 16389 | Massinissa Lalam | 68.49 | The queue size value (QS) is calculated by equation (9-0a). Based on this equation it is not possible to have QS = 254 or QS = 255. Therefore "A queue size value of 254" and "A queue size value of 255" do not make any sense. I think the intent is to refer to the bitmap (combination of SF and UV bits) leading to such values, which is the "Queue Size subfield" value.Replace "A queue size value of 254" with "A Queue Size subfield equals to 254" and "A queue size value of 255" with "A Queue Size subfield equals to 255".You may also replace "A queue size value of 0" with "A Queue Size subfield equals to 0" but in this case both are correct. | As in comment. | Revised –Agree in principle with the comment. Proposed resolution clarifies this aspect by providing the Queue Size field as a list of value ranges.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 16389. |
| 16911 | Tomoko Adachi | 68.53 | "If an MSDU or A-MSDU is fragmented and is not carried in an A-MPDU, then the queue size value may remain constant in all fragments even if the amount of queued traffic changes as successive fragments are sent." An MSDU/A-MSDU won't be directly carried in an A-MPDU but the fragments are the ones that can be carried in an A-MPDU. And this sentence should be describing the fragments that are carried in non-A-MPDU frames, in S-MPDUs, or in different A-MPDUs. | Change it to read "If an MSDU or A-MSDU is fragmented, the queue size values of the fragments carried in non-A-MPDU frames, in S-MPDUs, or in different A-MPDUs may remain constant even if the amount of queued traffic changes as succeesive fragments are sent." | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested changes, while using similar language as the language used in doc 11-18/1540r1, which proposed similar changes for BSR Control field.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 16911. |
| 16912 | Tomoko Adachi | 68.55 | "If an MSDU or A-MSDU is fragmented and is carried in an A-MPDU, then the queue size bits 8-15 of the QoS Control field is set as defined in 10.13.1 (A-MPDU contents)." An MSDU/A-MSDU won't be directly carried in an A-MPDU but the fragments are the ones that can be carried in an A-MPDU. And this sentence should be describing all or a subset of fragments that are carried in the same A-MPDU. | Change it to read "When the fragments are carried in the same A-MPDU, the queue size bits 8-15 of the QoS Control field are set as defined in 10.13.1 (A-MPDU contents)." | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested changes, while using similar language as the language used in doc 11-18/1540r1, which proposed similar changes for BSR Control field.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 16912. |
| 16077 | Mark RISON | 68.30 | "including the MSDUs or A-MSDUs in the transmission" -- it is not clear what is meant by "the transmission" | Change the cited text at the referenced location to "excluding the MSDU of the present QoS Data frame" (to match the non-HE case at 68.7) | Revised –Agree in principle with the comment. Proposed resolution clarifies that transmission refers to the present MPDU or A-MPDU.TGax editor to make the changes shown in 11-18/1699r1 under all headings that include CID 16077. |

**Discussion: *None.***

* Queue Size subfield

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 16232):***

**9.2.4.5.6.1 General**

The Queue Size subfield is an 8-bit field that indicates the amount of buffered traffic for a given TC or TS at the non-HE non-AP STA sending ~~this frame~~ the frame that contains this subfield and the amount of buffered traffic at the non-AP STA intended for transmission to the HE AP identified by the receiver address of the frame that contains this subfield.

The Queue Size subfield is present in QoS Data frames, and for HE STAs also in QoS Null frames, sent by non-AP STAs with bit 4 of the QoS Control field equal to 1. The AP might use information contained in the Queue Size subfield to determine the TXOP duration assigned to the STA or to determine the UL resources assigned to the HE non-AP STA (see 27.5.3 (UL MU operation)).*(#16232)*

**9.2.4.5.6.2 Queue Size field sent by a non-HE STA**

If sent by a non-HE STA or sent to a non-HE STA, the queue size value is the approximate total size, rounded up to the nearest multiple of 256 octets and expressed in units of 256 octets, of all MSDUs and A-MSDUs buffered at the STA (excluding the MSDU or A-MSDU of the present QoS Data frame) in the delivery queue used for MSDUs and A-MSDUs with TID values equal to the value in the TID subfield of this QoS Control field.

A queue size value of 0 is used solely to indicate the absence of any buffered traffic in the queue used for the specified TID.

A queue size value of 254 is used for all sizes greater than 64 768 octets. A queue size value of 255 is used to indicate an unspecified or unknown size.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 16232, 16077):***

**9.2.4.5.6.3 Queue Size field sent by an HE STA***(#16232)*

*(#16232)*

If sent by a non-AP HE STA to an HE AP, the queue size, *QS*, is the approximate total size in octets, of all MSDUs and A-MSDUs buffered at the STA (including the MSDUs or A-MSDUs of the present MPDU or A-MPDU*(#16077)* (#12749)) in the delivery queue used for MSDUs and A-MSDUs with TID values equal to the value in the TID subfield of this QoS Control field.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 16389):***

The Queue Size subfield contains:

* A value of 0 to indicate the absence of any buffered traffic in the queue used for the specified TID
* A value between 1 and 253 that represents *QS,* which is encoded as a Scaling Factor subfield in the 2 MSBs (bits 14-15) of the QoS Control subfield and an unscaled value, *UV*, in the 6 LSBs (bits 8-13) of the QoS Control subfield. The Scaling Factor subfield provides the scaling factor, *SF*, with an encoding that is shown in Table 9-18f (Scaling Factor subfield encoding)
* A value of 254 to indicate a queue size that is greater than 2 147 328 octets
* A value of 255 to indicate a queue size that is unspecified or unknown

*(#16389)***TGax Editor: *Change the paragraph below of this subclause as follows (#CID 15963):***

 An HE AP obtains the queue size, *QS*, from a received QoS Control field, which contains a scaling factor and an unscaled value, as follows:

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*(#15963)*

NOTE—The maximum *UV* value is 61 when the Scaling Factor subfield is 3 and is 63 when the Scaling Factor subfield is less than 3. *(#15963)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 15861, 15960, 15963):***

*QS* is an approximation of the actual queue size at the transmitter, where the approximation is due to rounding to a variable resolution. The transmitter rounds the actual queue size as follows:

* If QS = 0 then the UV subfield is set to 0 and the SF subfield is set to 0,
* Else if *QS* <= 1 008 the actual queue size is rounded up to the highest value that is a multiple of 16 octets, divided by 16, and the obtained value is placed into the UV subfield and the SF subfield is set to 0, else
* If QS <= 1 024 the UV subfield is set to 0 and the SF subfield is set to 1,
* Else if *QS* is <= 17 152 then the actual queue size minus 1024 is rounded up to the highest value that is a multiple of 256 octets, divided by 256, and the obtained value is placed into the UV subfield and the SF subfield is set to 1, else
* Else if *QS* <= 17 408 the UV subfield is set to 0 and the SF subfield is set to 2,
* Else if *QS* is <= 146 432 then the actual queue size minus 17 408 is rounded up to the highest value that is a multiple of 2 048 octets, divided by 2 048, and the obtained value is placed into the UV subfield and the SF subfield is set to 2,
* Else if QS <= 148 480 the UV subfield is set to 0 and the SF subfield is set to 3,
* Else if *QS* is <= 2 147 328 then the actual queue size minus 148 480 is rounded up to the highest value that is a multiple of 32 768 octets, divided by 32 768, and the obtained value is placed into the UV subfield and the SF subfield is set to 3.*(#15861, 15960, 15963)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 16912, 16911):***

If the fragments are carried in non-AMPDU or S-MPDU subframes, the queue size value of the MPDUs containing fragments might remain constant in all fragments even if the amount of queued traffic changes as successive fragments are transmitted. If the fragments are carried in an A-MPDU, the queue size values of the MPDU containing the fragments are set according to the rules in 10.13.1 (A-MPDU contents).*(#16912, 16911)*

* Frame Body field
* General

**TGax Editor: *Change the table below of this subclause as follows (#CID 16366):***

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| * Maximum data unit sizes (in octets) and durations (in microseconds)
 |
|  | Non-HT non-VHT non-DMG PPDU and non-HT duplicate PPDU | HT PPDU | VHT PPDU | HE PPDU | DMG PPDU |
| MMPDU size | 2304 | 2304 | See NOTE 1 | See NOTE 1 | 2304 |
| MSDU size | 2304 | 2304 | 2304 | 2304 | 7920 |
| A‑MSDU size | 3839 or4065 (see NOTE 2) (HT STA, see also Table 9-162 (Subfields of the HT Capability Information field)), or N/A (non-HT STA, see also 10.12 (A‑MSDU operation)) | 3839 or 7935 (see also Table 9-162 (Subfields of the HT Capability Information field)) | See NOTE 3 | See NOTE 3 | 7935 |
| MPDU size | See NOTE 4 | See NOTE 5 | 3895 or 7991 or 11 454 (see also Table 9-249 (Subfields of the VHT Capabilities Information field)) | 3895 or 7991 or 11 454 (see also Table 9-249 (Subfields of the VHT Capabilities Information field)) | See NOTE 5 |
| PSDU size (see NOTE 7) | 212–1 (see Table 15-5 (DSSS PHY characteristics), Table 16-4 (HR/DSSS PHY characteristics), Table 17-21 (OFDM PHY characteristics), Table 18-5 (ERP characteristics)) | 216–1 (see Table 19-25 (HT PHY characteristics)) | 4 692 480 (~222.16) (see Table 21-29 (VHT PHY characteristics)) | 6,500,631 (~222.63)(see Table 28-51 (HE PHY characteristics)) | 218–1 (see Table 20-32 (DMG PHY characteristics)) |
| PPDU duration (see NOTE 7) | See NOTE 6 | 5484 (HT\_MF; see 10.26.4 (L\_LENGTH and L\_DATARATE parameter values for HT-mixed format PPDUs)) or 10 000 (HT\_GF; see Table 19-25 (HT PHY characteristics)) | 5484 (see Table 21-29 (VHT PHY characteristics)) | 5484 (see Table 28-51 (HE PHY characteristics)) | 2000 (see Table 20-32 (DMG PHY characteristics)) |
| NOTE 1—No direct constraint on the maximum MMPDU size; indirectly constrained by the maximum MPDU size (see 9.3.3.3 (Beacon frame format)).NOTE 2—Indirect constraint from the maximum PSDU size: 212–1 octets minus the minimum QoS Data frame overhead (26 octets for the MAC header and 4 octets for the FCS).NOTE 3—No direct constraint on the maximum A‑MSDU size; indirectly constrained by the maximum MPDU size.NOTE 4—No direct constraint on the maximum MPDU size; indirectly constrained by the maximum MSDU/MMPDU or (for HT STAs only) A‑MSDU size.NOTE 5—No direct constraint on the maximum MPDU size; indirectly constrained by the maximum A‑MSDU size.NOTE 6—No direct constraint on the maximum duration, but an L\_LENGTH value above 2332 might not be supported by some receivers (see last NOTE in 10.26.4 (L\_LENGTH and L\_DATARATE parameter values for HT-mixed format PPDUs)).NOTE 7—The values for maximum PSDU size and maximum PPDU duration are informative only. References to the normative requirements are provided.NOTE 8—The maximum MPDU size might be greater than the size declared as supported by the recipient if the MPDU is an HE Compressed Beamforming and QCI frame.*(#16366)* |