IEEE P802.11
Wireless LANs

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| Comment resolutions for miscellaneous - Part 3 |
| Date: 2018-09-01 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D3.0 with the following CIDs (13 CIDs):

* 16367, 15805, 15806, 16078, 16001, 16000, 16443, 15743, 15839, 16327,
* 16326, 15884, 15886

Revisions:

* Rev 0: Initial version of the document.

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** |
| 16367 | Mark RISON |  | It is not clear whether an HE STA in the 2.4 GHz band uses the HT or VHT capabilities related to MPDU size | As it says in the comment | Revised –The rules for MPDU size support for an HE STA are specified in 27.16.1 (Basic HE BSS functionality). Quoting: *An HE STA shall not transmit an MPDU in an HE PPDU to a STA that exceeds the maximum MPDU**length capability indicated in the VHT Capabilities element received from the recipient STA or that exceeds the Maximum A-MSDU Length in the HT Capabilities element received from the recipient STASTA unless the MPDU is an HE Compressed Beamforming/CQI frame (see 27.6.3 (Rules for HE sounding protocol sequences))*”.Proposed resolution is to clarify that the A-MSDU Length dependency is valid when no VHT Capabilities element is received from the recipient STA.TGax editor to make the changes shown in 11-18/1775r0 under all headings that include CID 16367. |
| 15805 | Joseph Levy | 65.36 | Why is it necessary to restrict the optional AP behavior of setting the More Data subfield to 1 in Ack frames to a non-HE STA. If an HE STA receives and Ack frame with the More Data subfield set to 1 is there a problem? I hope not as if there is then there is a significant backward compatibility issue as HE AP should be able to support non-HE STAs. Therefore remove the restriction on an AP not setting the More Data subfield to an Non-HE STA. | Revert this paragraph back to as it was in 802.11-2016 and modified by 802.11ah. If additional restriction are necessary for an HE STA add them in a separate paragraph. | Rejected –The comment is asking several questions. The optional behavior of the AP setting the MD bit to 1 in Ack frames sent to non-HE STAs is from baseline. As such it is out of scope for this amendment, however the reason would be that an MD bit equal to 0 would cause the non-HE STA to go to doze state, while the AP would want the STA to be there (requiring it to set the MD bit to 1) which is not backwards compatible. There is no problem for an HE STA to receive a frame with MD bit set to 1 provided that the AP supports setting the MD bit to 1 and the STA also support its reception, in which case the HE STA cannot early terminate the TWT SP. As mentioned above the issue would be when the AP does not support setting the MD to 1, and in turn the STA receiving an MD of 0 would go to doze state but the AP would have not wanted it to. |
| 15806 | Joseph Levy | 65.38 | There is no need to specify the behavior of an HE AP regarding the use of the more data subfield in the frame format section on the More Data subfield. How an HE AP indicates its support or nonsupport of the More Data subfield should be described elsewhere. | Remove/relocate the text: "An HE AP indicates that it supports setting the More Data subfield to 1 in these control response frames by setting he More Data Ack subfield to 1 in the QoS Info field of elements it includes in frames transmitted to the STA. The QoS Info field is present in the QoS Capability, EDCA Parameter Set, and MU EDCA Parameter Set elements transmitted by an HE AP." | Rejected –The spec text added in this subclause provides the setting of the MD bit in different cases, non-HE, HE and so on and is not describing behavior per se. The behavior is described in clause 27.7 which is cited in the subclause itself to help the reader find the normative behavior. |
| 16078 | Mark RISON | 67.54 | It needs to be clear that the Queue Size is based on what has been passed in MA-UNITDATA.request and there is no visibility of any traffic queued above the MAC SAP | At the end of the referenced subclause add "NOTE---The Queue Size is based on data received by the STA at the MAC SAP (MA-UNITDATA.request). Any data in layers above the MAC is not taken into account." | Rejected –The fact that the queue size is reporting the queue size for a particular TID is clearly an indication that the queue size is reported for what is visible at the MAC layer, since TID is an identifier that is assigned to the MSDUs received from the SAP at the MAC itself. Hence, no further clarifications are needed for this subclause.  |
| 16001 | Mark RISON | 68.06 | "of all MSDUs and A-MSDUs buffered at the STA". A STA does not buffer A-MSDUs. The things it receives via MA-UNITDATA.request are MSDUs, and those are the things it buffers prior to transmission | Add a "NOTE---Buffered MSDUs are those that have been received in an MA-UNITDATA.request but that have not been successfully transmitted." | Rejected –This terminology is inherited from REVmd and is present in 802.11-2016 as well. While I tend to agree that the things that are buffered at the STA are the MSDUs and not the A-MSDUs I think this is a topic to be discussed in REVmd since it has implications also for legacy devices that are using the same description. Hence, no further clarifications are needed for this subclause. |
| 16000 | Mark RISON | 68.06 | "of all MSDUs and A-MSDUs buffered at the STA". A STA does not buffer A-MSDUs. The things it receives via MA-UNITDATA.request are MSDUs, and those are the things it buffers prior to transmission | Change the cited text at the referenced location and 68.29, 78.12, to "of all MSDUs buffered at the STA" | Rejected –This terminology is inherited from REVmd and is present in 802.11-2016 as well. While I tend to agree that the things that are buffered at the STA are the MSDUs and not the A-MSDUs I think this is a topic to be discussed in REVmd since it has implications also for legacy devices that are using the same description. Hence, no further clarifications are needed for this subclause. |
| 16443 | Matthew Fischer | 181.17 | Coordination between Aps is needed to ensure good utilization of DL OFDMA and TWT. Provide some simple coordination mechanism or at least signaling that allows Aps and STAs to exchange information regarding their scheduled activity. | Add a mechanism to exchange schedule information between STAs among different BSSs. | Rejected –Some basic level of coordination is already possible with broadcast TWT since the TWT schedules in this case are visible to BSSs due to their inclusion in beacon frames, which in turn can be considered by OBSS STAs when creating their schedules. The addition of more complex signaling for AP coordination is out of scope of IEEE802.11ax and may be investigated in detail in future amendments. |
| 15743 | Jarkko Kneckt | 361.01 | The intra-PPDU power save is STA internal operation and it is not visible outside of the device. Such a feature should not be described in the specification, because it is totally invisible ourside of the device and optional for the STA. The ax specification should specify signaling or operation that is needed to ensure good interoperability of the devices. | Delete clause 27.14 | Rejected –Inter-ppdu PS allows the STA to go to doze state when receiving PPDUs that are not addressed to it when explicit conditions listed in the standard are satisfied. If these conditions were not in the standard then the STA would not be allowed to go to doze state since a STA that goes to doze state without the knowledge of the AP would not be interoperable. |
| 15839 | Laurent Cariou | 361.06 | Intra PPDU power save can also be used by active STAs. The statement currently only refers to "move to doze state" so this should be change to something such as "become unavailable" to cover the unavailability of any STAs, in active mode or PS mode. | Change "move to doze state" by "become unavailable" or make changes to active mode to also allow in very specific circunstances to go to doze state. | Revised –Agree in principle with the comment. Proposed resolution adds the necessary clarifications.TGax editor to make the changes shown in 11-18/1775r0 under all headings that include CID 15839. |
| 16327 | Mark RISON |  | The generic concept should be "HE compressed beamforming and CQI feedback", by analogy with the baseline's "VHT compressed beamforming feedback". This in turn consists of HE Compressed Beamforming Report information, HE MU Exclusive Beamforming Report information and/or HE CQI Report information. This in turn gets put into one or more HE Compressed Beamforming And CQI frames | Also fix refs to "beamforming feedback" in 28.3.15.3, 28.3.16 | Revised –Agree in principle with the comment’s general description. Several issues raised by the comment have already been addressed by CIDs resolved in 11-18/1502r2, e.g., defining HE Compressed Beamforming/CQI frame and referring to the feedback as HE compressed beamforming/CQI report. Since report and feedback are synonyms in this context the preference is to use the terminology that was already motioned as such in the September F2F as part of 1502r2 and as part of the resolutions to CID 16328.TGax editor: Replace “HE compressed beamforming report” with “HE compressed beamforming/CQI report”, when it is not part of the name of a field or frame, throughout the draft.TGax editor to make the changes shown in 11-18/1775r0 under all headings that include CID 16327. |
| 16326 | Mark RISON |  | The generic concept should be "HE compressed beamforming and CQI feedback", by analogy with the baseline's "VHT compressed beamforming feedback". This in turn consists of HE Compressed Beamforming Report information, HE MU Exclusive Beamforming Report information and/or HE CQI Report information. This in turn gets put into one or more HE Compressed Beamforming And CQI frames | In 27.6.1 "The HE compressed beamforming and CQI report is carried in" should be about the "feedback", not "report". "the HE beamforming feedback" at the end of 27.6.1 should be "the HE compressed beamforming and CQI feedback". In 28.3.15.2 "the HE compressedbeamforming feedback" should be "the HE compressedbeamforming and CQI feedback" (2x) | Revised –Agree in principle with the comment’s general description. Several issues raised by the comment have already been addressed by CIDs resolved in 11-18/1502r2, e.g., defining HE Compressed Beamforming/CQI frame and referring to the feedback as HE compressed beamforming/CQI report. Since report and feedback are synonyms in this context the preference is to use the terminology that was already motioned as such in the September F2F as part of 1502r2 and as part of the resolutions to CID 16328.TGax editor: Replace “HE compressed beamforming report” with “HE compressed beamforming/CQI report”, when it is not part of the name of a field or frame, throughout the draft.TGax editor to make the changes shown in 11-18/1775r0 under all headings that include CID 16326. |
| 15884 | Liwen Chu | 149.57 | Add the sentence in encoding column that an AP sets it to 1. | As in the comment | Revised –Agree and incorporated as suggested.TGax editor to make the changes shown in 11-18/1775r0 under all headings that include CID 15884. |
| 15886 | Liwen Chu | 153.14 | The definition of the Capability is not in line with the nomative description subclause. Harmonize them. | As in the comment | Revised –Agree with the comment. Proposed resolution is to point where the normative behavior is defined.TGax editor to make the changes shown in 11-18/1775r0 under all headings that include CID 15886. |

**Discussion: *None.***

* Basic HE BSS functionality

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 16367):***

An HE STA shall not transmit an MPDU in an HE PPDU to a STA that exceeds the maximum MPDU length capability indicated in the VHT Capabilities element received from the recipient STA or if no VHT Capabilities element is received from the recipient STA then that exceeds the Maximum A-MSDU Length in the HT Capabilities element received from the recipient STA unless the MPDU is an HE Compressed Beamforming/CQI frame (see 27.6.3 (Rules for HE sounding protocol sequences))(#16074).*(#16367)*

**27.14.1 Intra-PPDU power save for non-AP HE STAs**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 15839):***

Intra-PPDU power save is the power save mechanism for an HE STA to enter the doze state or become unavailable until the end of a received PPDU which is identified as an Intra-BSS frame by the below conditions listed in this subclause. The STA can enter the doze state if it is in PS mode and can become unavailable if it is in Active mode (see 11.2.3.2).*(#15839)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 15839):***

A non-AP HE STA that is in intra-PPDU power save mode may enter the doze state or become unavailable until the end of a PPDU currently being received when one of the following conditions is met:*(#15839)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 15839):***

A non-AP HE STA that is in intra-PPDU power save mode and has entered doze state or has become unavailable shall continue to operate its NAV timers and consider the medium busy and shall transition into awake state at the end of the PPDU.*(#15839)*

**28.3.15.3 CQI feedback(#16013)**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 16327, 16326):***

If the HE NDP Announcement frame requests CQI feedback(#16013), then(#15533) upon receipt of the HE NDP, the beamformee computes CQI feedback(#16013) as described in 9.4.1.67 (HE CQI Report field(#16013)). The CQI feedback(#16013), *CQIs,r,u*, for beamformee *u* in RU *r* for space-time stream *s* shall be estimated using the method described in 9.4.1.67 (HE CQI Report field(#16013)). The CQI values to be fed back are derived from quantized SNRs according to Table 9-94h (Average SNR of RU index k for space-time stream i subfield). The beamformee shall transmit the CQI feedback(#16013) for space-time stream 1, …, *Nc* for each of the RU indices for which the CQI report(#16013) is being requested by the beamformer. After receiving the CQI information, the beamformer may use it to identify the best range of RUs for compressed beamforming/CQI report or for RU assignment during subsequent MU transmissions. The actual use is implementation specific.*(#16327, 16326)*

* HE MAC Capabilities Information field

**TGax Editor: *Change the rows below of the table as follows (#CID 15884, 15886):***

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| * Subfields of the HE MAC Capabilities Information field
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| Subfield | Definition | Encoding |
| … | ... | … |
| TWT Requester Support | Indicates support for the role of TWT requesting STA as described in 27.7 (TWT operation)). | Set to 1 if dot11TWTOptionActivated is true and the STA supports TWT requesting STA functionality (see 27.7 (TWT operation)). Set to 0 otherwise. |
| TWT Responder Support | Indicates support for the role of TWT responder STA as described in 27.7 (TWT operation)). | Set to 1 if dot11TWTOptionActivated is true and the STA supports TWT responder STA functionality (see 27.7 (TWT operation)). Set to 0 otherwise.An AP sets the TWT Responder Support subfield to 1.*(#15884)* |
| … | … | … |
| Flexible TWT Schedule Support | Indicates support for the reception of TWT Information frames with flexibe TWT schedules as defined in 27.7.4.4 (TWT information frame for flexible TWT). | Set to 1 if the STA supports reception of a TWT Information frame with flexible TWT schedules.Set to 0 otherwise.*(#15886)* |