IEEE P802.11  
Wireless LANs

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| **CR for 10.3.2.10** |
| **Date:** 2017-09-01 |

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Abstract

This submission proposes resolutions for multiple comments related to TGax D1.0 with the following CIDs (15 **CIDs**):

* Provided the resolutions for CID 3183, 3184, 4836, 4837, 4838, 5762, 6171, 6172, 6503, 7498, 7664, 8386, 8412, 9471, 9853

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** | **PP.LL** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
| 3183 | 119.55 | Add GCR MU-BAR to: "An AP may use an MU-BAR variant Trigger frame to solicit acknowledgment frames ..." | "An AP may use an MU-BAR variant or GCR MU-BAR variant Trigger frame to solicit acknowledgment frames ..." | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 3184 | 119.22 | Add GCR MU-BAR to: "A non-AP STA that is the recipient, within an HE MU PPDU, of a QoS Data frame or QoS Null frame that solicits an immediate response with Ack Policy equal to MU Ack in the QoS Control field, of an MU-BAR frame, ..." | "A non-AP STA that is the recipient, within an HE MU PPDU, of a QoS Data frame or QoS Null frame that solicits an immediate response with Ack Policy equal to MU Ack in the QoS Control field, of an MU-BAR frame, or GCR MU-BAR frame, ..." | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 4836 | 118.47 | This statement may not be true for HE, since there are new BA formats, fragmentation and new rules. | Remove the reference to HE in this statement | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 4837 | 118.55 | "Responses to A-MPDUs within a VHT MU PPDU or an HE MU PPDU for DL transmission that are not immediate responses to the VHT MU PPDU or the HE MU PPDU for DL transmission are transmitted in response to explicit BlockAckReq frames by the AP" This is an option, but not the only one | BARs can also be sent in response to an implicit block ack request in one of the following PPDUs | Revised.  Agree in principle.  BA can be solicited by an MU-BAR Trigger frame or a GCR MU-BAR Trigger frame  TGax editor make changes as in 11-17/1317r0. | MAC |
| 4838 | 118.48 | "MU PPDU for DL transmission" is not defined. | change to MU PPDU sent by an AP STA | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 5762 | 118.58 | The response can be solicited by MU-BAR | chagne to "are transmitted in response to explocit BlockAckReq or MU-BAR..." | Revised.  Agree in principle.  But, responses to A-MPDUs within only an HE MU PPDU can be solicited by MU-BAR or GCR MU-BAR Trigger frames.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 6171 | 118.48 | For acknowledgement procedure for DL MU PPDU in SU format, it assumes that at most one STA does not have a BA session. Otherwise it is impossible to solicit two consequetive ACKs | Clarify the case that 2 or more STAs have a single Data MPDU contained in the HE MU PPDU for DL transmsssion | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 6172 | 119.36 | Figure 10-12a: "A-MPDU with trigger contraining UL trigger information" is not a good description | change to "An A-MPDU containing UL trigger information" | Accepted. | MAC |
| 6503 | 119.08 | Use of undefined term: "Single MPDU". From the capitalization, it must be inferred that this is a defined term, but where is the definition? The draft also uses "single MPDU", and for good measure both "VHT Single MPDU" and "VHT single MPDU". The baseline | Clarify. | Revised.  Already fixed with S-MPDU. | MAC |
| 7498 | 119.25 | "UL MU Response Scheduling A-Control field" should be changed to "UL MU Response Scheduling Control subfield". | As per comment | Reivsed.  Already fixed with UMRS Control field. | MAC |
| 7664 | 118.37 | Update Figure 10-11 through removing Ack from the PPDU solicited by BAR | As in comment | Rejected.  Not in the scope of 11ax. | MAC |
| 8386 | 119.21 | The title of 10.3.2.10.2 is misleading. It is obvioius that the section talks about HE MU PPDU, but the title uses the term "DL MU PPDU" which includes VHT MU PPDU. | Change the title of 10.3.2.10.2 to Acknowledgement procedure for HE MU PPDU in MU format | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 8412 | 119.24 | The description "defined by the UL trigger information" seems to be redundant. Further, there is really no specific definition for UL trigger information. | delete the description "defined by the UL trigger information". Similarly, Figure 10-12a should be reivsed. | Revised.  Agree in principle.  TGax editor make changes as in 11-17/1317r0. | MAC |
| 9471 | 119.23 | "A non-AP STA that is the recipient, within an HE MU PPDU, of a QoS Data frame or QoS Null frame that solicits an immediate response with Ack Policy equal to MU Ack in the QoS Control field, of an MU-BAR frame, or of an MMPDU that solicits an immediate response, shall send the immediate response according to the scheduling information defined by the UL trigger information that is carried either in the Trigger frame(s) or UL MU Response Scheduling A-Control field." Is the immediate response in OFDMA only? | Please clarify. | Rejected.  Immediate response may be sent in OFDMA only or OFDMA+MU-MIMO according to the value of the Trigger frame or the UMRS Control field.  No need further clarification. | MAC |
| 9853 | 119.09 | Response to an MU-BAR frame shall use a trigger-based PPDU format. Therefore, this is not the case for this sub-clause. | Delete "or MU-BAR frame with multi-TID BAR variant" from the sentence. | Revised.  Agree in principle.  MU-BAR Trigger frame does not solicit a BA frame sent in a SU PPDU.  TGax editor make changes as in 11-17/1317r0. | MAC |

**Discussion:** *None*

**Propose:**

Revised for CID3183, 3184, 4836, 4837, 4838, 5762, 6171, 6172, 6503, 7498, 7664, 8386, 8412, 9471, 9853 per discussion and editing instructions in 11-17/1317r0.

***TGax editor: Modify the sentence in the D1.4 as the following:***

**10.3.2.10.1 Acknowledgement procedure for DL MU PPDU in SU format**

The acknowledgment procedure performed by a STA that receives MPDUs that were transmitted within a VHT MU PPDU ~~or an HE MU PPDU for DL transmission~~(#4836) is the same as the acknowledgment procedure for MPDUs that were not transmitted within a VHT MU PPDU ~~or an HE MU PPDU for DL transmission~~(#4836).

NOTE-All MPDUs transmitted within a VHT MU PPDU or an HE MU PPDU ~~for DL transmission~~ sent by an AP(#4838) are contained within A-MPDUs, and the rules specified in 9.7.3 (A-MPDU contents) prevent an immediate response carried in SU format to more than one of the A-MPDUs.

Responses to A-MPDUs within a VHT MU PPDU ~~or an HE MU PPDU for DL transmission~~ (#4837)(#6171)that are not immediate responses to the VHT MU PPDU ~~or the HE MU PPDU for DL transmission~~ (#4837)(#6171)are transmitted in response to explicit BlockAckReq frames by the AP. Examples of VHT MU PPDU frame exchange sequences are shown in Figure 10-11 (An example of a TXOP containing a VHT MU PPDU transmission with an immediate acknowledgment to the VHT MU PPDU) and Figure 10-12 (An example of a TXOP con-taining a VHT MU PPDU transmission with no immediate acknowledgment to the VHT MU PPDU).

Responses to A-MPDUs within an HE MU PPDU sent by an AP that are not immediate responses to the HE MU PPDU sent by an AP are transmitted in response to explicit BlockAckReq frames or an MU-BAR Trigger frame or a GCR MU-BAR Trigger frame by the AP(#4837)(#6171).

Recovery within the TXOP that contains a VHT MU PPDU or an HE MU PPDU ~~for DL transmission~~ sent by an AP(#4838) can be performed according to the rules of 10.22.2.7 (Multiple frame transmission in an EDCA TXOP). BlockAck- Request frames related to A-MPDUs within a VHT MU PPDU or an HE MU PPDU ~~for DL transmission~~ sent by an AP(#4838) can be transmitted in a TXOP separate from the one that contained the VHT MU PPDU or the HE MU PPDU ~~for DL transmission~~ sent by an AP(#4838).

NOTE 1—A BlockAck frame or an Ack frame is sent in immediate response to the BlockAckReq frame for HT-immediate or HT-delayed Block Ack, respectively. An Ack frame might be sent in immediate response carried in SU format to an S-MPDU(#7780) in the VHT MU PPDU or the HE MU PPDU ~~for DL transmission~~ sent by an AP(#4838). Responses to S-MPDUs for more than one STA contained in an HE MU PPDU are transmitted as specified in 10.3.2.10.2 Acknowledgement procedure for DL MU PPDU in MU format(#6171). A Multi-STA BlockAck frame is sent in immediate response to the BlockAckReq frame with multi-TID BAR variant ~~or MU-BAR Trigger frame(#10252) with multi-TID BAR variant~~(#9853).

NOTE 2—A BlockAckReq~~uest~~(#Ed) frame would typically not be sent to a STA in the case where the A-MPDU to the STA contained no MPDUs requiring acknowledgment. It could be sent if MPDUs in a previous A-MPDU remain unacknowledged.

**10.3.2.10.2 Acknowledgement procedure for ~~DL~~ HE**(#8386) **MU PPDU in MU format**

A non-AP STA that is the recipient, within an HE MU PPDU, of a QoS Data frame or QoS Null frame with ack policy HTP Ack(#4723)(#7062), of an MU-BAR Trigger frame(#10252) or a GCR MU-BAR Trigger frame(#3184), or of an MMPDU that solicits an immediate response, shall send the immediate response according to the scheduling information ~~defined by the UL trigger information~~(#8412) that is carried either in the Trigger frame(s) or UMRS Control field(#Ed). If no valid Trigger frame(s) (see 9.3.1.23 (Trigger frame format)) or UMRS Control field(#Ed) (see 9.2.4.6.4.2 (UMRS Control(#4727)(#3104))) is received, then the STA shall not respond. An example of UL OFDMA acknowledgement to an HE MU PPDU is shown in Figure 10-12a (An example of an HE MU PPDU trans-mission with an immediate UL OFDMA acknowledgement).



An AP may use an MU-BAR Trigger frame(#10252) or a GCR MU-BAR Trigger frame(#3183) to solicit acknowledgment frames from multiple HE STAs to which the AP has sent QoS Data frame(s) with the Ack Policy subfield equal to Block Ack or from which the AP has not received immediate acknowledgement frames after sending QoS Data frame(s) with the Ack Policy subfield equal to HTP Ack(#4723) in an HE MU PPDU.