IEEE P802.11  
Wireless LANs

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| Resolution of CID 3462 | | | | |
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| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Solomon Trainin | Qualcomm |  |  | strainin@qti.qualcomm.com |
| Assaf Kashet | Qualcomm |  |  | akasher@qti.qualcomm.com |
| Alecsander Eitan | Qualcomm |  |  | eitana@qti.qualcomm.com |

Abstract

Resolution of CID 3462, 3663

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | | **Proposed Change** | **Resolution** |
| 3462 | 172.00 | 9.7.3 | Currently the method to deliever an MPDU from a TID w/o BA agreement is to send a SU-PPDU with aggregation bit in L-header set to 1  However, for DL-MU, QoS data must be aggregated with a Block Ack Schedule frame. This precludes DL-MU PPDU used to deliver an MPDU w/o a BA agreement | | suggest to allow at most one data frame sent w/o a BA agreement in Table 9-425 | Agree in principal, more changes are needed  **Proposal: Revised** |
| 3663 | 177.00 | 10.3.2.13 | | Transmission of MPDU w/o BA agreement is not supported in the definition of MU MIMO. Support of that is relevant for optimal use of MU MIMO and shall be provided. | Provide rules in 10.3.2.13 MU acknowledgment procedure and in 10.26.4 Selection of BlockAck and BlockAckReq variants: 1. mandate support of Multi\_TID BA for MU MIMO capable devices 2. define Ack policy = Scheduled BA for MPDU out of BA agreement 3. define Figure 5 --Per-TID Info subfield definition in 9.3.1.8.8 EDMG Multi-TID BlockAck variant that the BlockAck Bitmap=8 and BlockAck Bitmap all zeros, and BlockAck Starting Sequence Control=0, RBUFCAP=0 | Agree in principal.  In relation to the indication the Ack context is added to the AckType in the Multi-TID BlockAck to acknowledge the MPDU delivered in the EDMG MU-MPDU  **Proposal: Revised** |

Discussion: Delivery in the EDMG MU-MPDU of MPDU with TID that the BlockAck agreement does not exist is important to keep efficiency of the MU-MIMO. The changes are needed in multiple places and not only in the 9.7.3 and 10.3.2.13 as proposed. The revised solution adapts the approach used in TGax. The Ack context is added to the AckType in the Multi-TID BlockAck to acknowledge the MPDU delivered in the EDMG MU-MPDU.

*TGay editor change as follows the Table 3 – AckType subfield definition*

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| --- | --- | --- | --- |
| **AckType subfield value** | **TID subfield value** | **Presence of Block Ack Starting Sequence Control subfield and Block Ack Bitmap subfields** | **Context of a Per TID Info subfield in a Multi-STA BlockAck frame** |
| 0 | 0-15 | Present | Block acknowledgment context is sent in response:  to MPDUs in an A-MPDU that solicits an immediate block acknowledgement or   * to a BlockAckReq frame or   to A-MPDU with ack policy set to Scheduled Ack |
| 1 | 0-15 | Not present | Ack context: Sent as a response to an MPDU of TID that does not have BA agreement and with ack policy set to Scheduled Ack |
| 2 | 0-15 | Not present | All-ack context:  Sent as a response to an A-MPDU that solicits an immediate response or solicits a response to A-MPDU of ack policy set to Scheduled Ack and all MPDUs contained in the A-MPDU per TID are received successfully. |

**10.3.2.13 MU acknowledgment procedure**

*TGay editor from P178L15 till P179L5*

*at each appearance of “*BlockAck frame” replace by

“BlockAck frame or EDMG Multi-TID BlockAck (10.26.5 Selection of BlockAck and BlockAckReq variants)

*at each appearance of* “BAR frame” replace by

“BlockAckReq frame or Multi-TID BlockAckReq frame (10.26.5 Selection of BlockAck and BlockAckReq variants)”

*P178L15*

The EDMG STA indictates that it is DL MU-MIMO capable by assertion of the MU-MIMO Supported subfield to 1. The MU-MIMO initator shall not transmit the EDMG MU-MIMO PPDU to the STA that does not set to 1 the MU-MIMO Supported subfield.

The EDMG STA that set to 1 the MU-MIMO Supported subfield shall support Multi-TID BlockAck frame. The MU-MIMO Initiator may transmit one QoS MPDU of TID that BlockAck Agreement does not exist. The MU-MIMO Responder shall respond to the MPDU with the Multi-TID BlockAck following rules defined in 10.73.10 Acknowledgement context in a Multi-TID BlockAck frame.

The EDMG STA that set to 1 the MU-MIMO Supported subfield may set the EDMG Multi-TID Aggregation Support subfield of the EDMG Capabilities element it transmits to a nonzero value.

The EDMG STA that set to 1 the MU-MIMO Supported subfield and set the EDMG Multi-TID Aggregation Support subfield of the EDMG Capabilities element it transmits to a nonzero value may set the EDMG All Ack Support subfield of the EDMG Capabilities element it transmits equal to 1

The EDMG STA that set to 1 the MU-MIMO Supported subfield and set the EDMG Multi-TID Aggregation Support subfield of the EDMG Capabilities element it transmits to a nonzero value shall follow ruled defined in 10.73 EDMG A-MPDU with multiple TIDs.

**10.26.5 Selection of BlockAck and BlockAckReq variants**

*TGay editor add new paragraph on P193L19*

An EDMG STA shall respond with the Multi-TID BlockAck to an A-MPDU conveyed in the EDMG MU-MIMO PPDU that contains MPDU of TID without BlockAck agreement.

**10.73.10 Acknowledgement context in a Multi-TID BlockAck frame**

*P311L38*

A recipient of a multi-TID A-MPDU and of the EDMG MU-MIMO PPDU sets the AckType subfield in the Multi-TID BlockAck frame sent as a response depending on the acknowledgement context. The following acknowledgement contexts are defined:

*P312L10*

Ack context: the recipient of EDMG MU-MIMO PPDU shall set the AckType subfield to 1 and the TID field of the Per-TID Info subfield to a TID value of the QoS MPDU with no BlockAck agreement contained in the EDMG MU-MIMO PPDU. The recipient of the A-MPDU contained in the EDMG MU-MIMO PPDU shall set the AckType subfield to 1 and the TID field of each Per-TID Info subfield to a TID value of the QoS MPDU with no BlockAck agreement contained in the EDMG MU-MIMO PPDU.

If all MPDUs in the multi-TID A-MPDU are received successfully, the recipient may follow the procedure described in the All Ack context. Otherwise, the recipient shall use the procedure defined in the BlockAck and Ack context.

**9.7.3 A-MPDU contents**

*TGay editor append new line to the Table 9-425*

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| --- | --- |
| **MPDU description** | **Conditions** |
| Data without a block ack  agreement | QoS Data frames with a TID that does not correspond to a block ack agreement.  These one per TID MPDUs with Ack Policy field equal to Scheduled Ack are conveyed in EDMG MU-MIMO PPDU |

**References:**

IEEE P802.11ay/D2.1, October 2018