IEEE P802.11  
Wireless LANs

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| Comment resolution | | | | |
| Date: 2018-0710 | | | | |
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Resolution of CIDs 2271, 2286, 2323, 2401, 2402 is presented

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| **CID** | **Page** | **Clause** | **Duplicate of CID** | **Comment** | **Proposed Change** |
| 2271 | 101.01 | 9.7.3 |  | It is not clear how EDMG Multi-TID BlockAck acktype '10' is used? 1) only for Data frame w/o HT immediate BA agreement in an AMPDU, or 2) for MPDU with an HT immediate BA agreement but it is the only MPDU for the TID in the AMPDU    if it is 1)  Data frames without HT immediate BA agreement with ack policy normal ack should be in the MPDU description of table 9-425    if it is 2)  Delimiter of AMPDU in table 9-423 should be changed to for receiver to identify the only MPDU of a TID in an AMPDU | as in comment |

**Proposal: Revised**

Discussion:

There are TGax like features introduced to the TGay and presented in the 802.11ay D1.0. The mentioned features are MAC padding of MU PPDU using EOF signalling, and S-MPDU. Over the comment resolution process, the features were identified as irrelevant for the TGay and removed. (see resolution of CIDs 1867, 1961, 2108, 2269)

The Acknowledgment context of the EDMG Multi-TID BlockAck introduced in the TGay draft is of the same purpose as the pre-association ack context and Ack context in the Multi-TID BlockAck of the TGax. General purpose of the feature is to acknowledge single MPDU (S-MPDU) delivered in A-MPDU. There are no S-MPDUs in the TGay, so there is no need for the Acknowledgment context in TGay.

The proposal is to remove the Acknowledgment context from the Table 3 —AckType subfield definition.

***TGay Editor modify as follows (Draft 1.2)***

*P60*

**Table 3 —AckType subfield definition**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 EDMG Multi-TIDBlockAck frame** |
| 10 | NA | NA | Reserved |

**10.63.1 General**

P248L21

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| **CID** | **Page** | **Clause** | **Duplicate of CID** | **Comment** | **Proposed Change** |
| 2402 | 35.00 | 9.3.1.9.8 |  | The ack types "10" and "11" are almost the same, both them indicate it is a Ack frame although the reasons are different. Combin these two types into one type as 11ax | as per comment |

**Proposal: Reject**

Discussion:

The all-Ack context is of different purpose than the Acknowledgment context and is used to acknowledge successful delivery of frames under BlocAck agreement

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| 2401 | 102.00 | 9.7.3 |  | EDMG Multi-TID BlockAck is BlockAck, harmonize them. | as per comment |

**Proposal: Revised**

Discussion: Agree with the comment, suggest adding NOTE to clarify the conditions

***TGay Editor modify as follows (Draft 1.2)***

***P135***

|  |  |
| --- | --- |
| **MPDU** | **Conditions** |
| BlockAck | BlockAck frame with a TID that corresponds to an HT-immediate block ack agreement. see NOTE |

NOTE −The condition is applicable for the BlockAck variants established at the Block Ack agreement and is not applicable for EDMG Multi-TID BlockAck where the condition depends on preceding PPDU.

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| **CID** | **Page** | **Clause** | **Duplicate of CID** | **Comment** | **Proposed Change** |
| 2323 | 197.22 | 10.63 |  | EDMG STA rx Scheduled Ack in a Multi-TID AMPDU shall also respond with an EDMG Multi-TID BlockAck | change to 'with Ack Policy set to Implicit Block Ack or Scheduled Ack' |

**Proposal: Revised**

Discussion:

Agreed in general. The relevant rule in D1.2 is in the subclause 10.25.6 Selection of BlockAck and BlockAckReq variants.

***TGay Editor modify as follows (Draft 1.2)***

*P154L13*

An EDMG STA that indicates a nonzero value in the EDMG Multi-TID Aggregation Support subfield of the STA’s EDMG Capabilities element shall respond with an EDMG Multi-TID BlockAck variant frame to an A-MPDU that contains MPDUs of different TIDs and Ack policy equal to Normal Ack or Scheduled Ack. The STA shall set to one the Management Ack subfield in the BA Control field of the EDMG Multi-TID BlockAck variant frame to acknowledge Action or Management frame received in the multi-TID A-MPDU.

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| **CID** | **Page** | **Clause** | **Duplicate of CID** | **Comment** | **Proposed Change** |
| 2286 | 131.10 | 10.28.1 |  | In baseline 10.28.3 "An RD initiator that sets the RDG/More PPDU field to 1 in a +HTC or DMG frame transmitted during a TXOP shall set the AC Constraint subfield to 1 in that frame if the TXOP was gained through the EDCA channel access mechanism and shall otherwise set it to 0.". However, EDMG MU-PPDU can contain any AC and RD responder would not know what is the AC AP used to gain access | add 10.28.3 Rules for RD initiator    change the sentence to  "An RD initiator that sets the RDG/More PPDU field to 1 in a +HTC or non-EDMG frame transmitted during a TXOP shall set the AC Constraint subfield to 1 in that frame if the TXOP was gained through the EDCA channel access mechanism. An EDMG RD initiator that sets the RDG/More PPDU field to 1 in a MPDU in an EDMG MU-PPDU transmitted during a TXOP may set the AC Constraint subfield to 1 if all QoS Data frames in the PPDU to the RD responder belongs to the same AC. Otherwise RD initiator shall set it to 0." |

**Proposal: Revised**

Discussion:

There are few rules in that relation.

Originator’s rule is:

An RD initiator that sets the RDG/More PPDU field to 1 in a +HTC or DMG frame transmitted during a TXOP shall set the AC Constraint subfield to 1 in that frame if the **TXOP was gained through the EDCA channel** **access mechanism** and shall otherwise set it to 0. An RD initiator that sets the RDG/More PPDU field to 1 in a DMG frame transmitted during an SP can set the AC Constraint subfield to 1 to limit the Data frames transmitted by the RD responder.

From the responder point of view:

If the AC Constraint subfield is equal to 1, the RD responder shall transmit Data frames of only the same AC as the last frame received from the RD initiator.

If the AC Constraint subfield is equal to 0, the RD responder may transmit Data frames of any TID.

In other words, AC constraint =0 means no limit to the RD responder.

As you can see the AC Constraint =1 means that the responder is limited how to use AC in the response and if the AC constraint =0 it is not.

In the proposed solutions the TID’s of the responder are limited in relation to the AC used by the Initiator so keeping AC constraint =1 is relevant and required changes are presented below.

In relation to the indicated issue the existent normative text covers

* Multi TID A-MPDU transmission for SU PPDU and MU PPDU (10.63 EDMG A-MPDU with multiple TIDs in D1.2)
* RD support in response to Multi TID A-MPDU in SU PPDU (10.63 EDMG A-MPDU with multiple TIDs in D1.2)
* RD support in response to MU PPDU (11-18-0757-02-00ay-Resolution-of-CIDS-related-to-MU-BA-and-RD) that does not cover the RD response to Multi TID A-MPDU in MU PPDU

So, there is no solution presented of RD response to Multi TID A-MPDU in MU PPDU and the proposal below closes the gap.

The proposal uses the known solution of TGax as base line.

***TGay Editor modify as follows (Draft 1.2)***

**9.3.1.23 Block Ack Schedule frame format**

***TGay Editor modify as follows (11-18-0757-02-00ay-Resolution-of-CIDS-related-to-MU-BA-and-RD)***

*P61*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Response Offset | Response Duration | Next PPDU Start Offset | TID Aggregation Limit | Preferred AC | Reserved |
| Bits: | 16 | 16 | 16 | 4 | 2 | 10 |

Figure 11— Block Ack Schedule Information field format

If EDMG Multi-TID Aggregation Support is greater than 0 in the EDMG MAC Capability field of the EDMG AP that transmits an EDMG MU PPDU to the non-AP and non-PCP EDMG STA and the RDG/More PPDU bit is set to one in the QoS control filed of MPDU(s) in the EDMG MU PPDU the TID Aggregation Limit subfield indicates the maximum number of TIDs that can be aggregated by the RD Responder in the A-MPDU. Otherwise the TID Aggregation Limit subfield is reserved.

If EDMG Multi-TID Aggregation Support is greater than 0 in the EDMG MAC Capability field of the EDMG AP that transmits an EDMG MU PPDU to the non-AP and non-PCP EDMG STA and the RDG/More PPDU bit is set to one in the QoS control filed of MPDU(s) in the EDMG MU PPDU the Preferred AC subfield indicates the lowest AC for aggregation of MPDUs in the A-MPDU sent as a response to the RD Grant. Otherwise the Preferred AC subfield is reserved.

The encoding of the Preferred AC subfield is shown in Table xy1 (Preferred AC subfield encoding).

**Table xy1 Preferred AC subfield encoding**

|  |  |
| --- | --- |
| **Value** | **Description** |
| 3 | AC\_VO |
| 2 | AC\_VI |
| 1 | AC\_BE |
| 0 | AC\_BK |

**10.29.3 Rules for RD initiator**

***TGay Editor append at end of the subclause***

The value in the TID Aggregation Limit subfield in Block Ack Schedule frame shall be less than or equal to

*MT* + 1, where *MT* is the value indicated in the EDMG Multi-TID Aggregation Support subfield within the EDMG Capabilities element transmitted by the AP that is the intended receiver of the Multi-TID BlockAck frame.

**10.29.4 Rules for RD responder**

***TGay Editor modify as follows***

P1749L7 in IEEE P802.11-REVmd/D1.1, May 2018

For the non Multi-TID A-MPDU and non MU PPDU if the AC Constraint subfield is equal to 1, the RD responder shall transmit Data frames of only the same AC as the last frame received from the RD initiator. For a BlockAckReq or BlockAck frame, the AC is determined by xamining the TID field. For a Management frame, the AC is AC\_VO.

For the Multi-TID A-MPDU and/or MU PPDU if the AC Constraint subfield is equal to 1, the RD responder shall transmit Data frames following rules presented below in this subclause and in 10.63 EDMG A-MPDU with multiple TIDs

***TGay Editor append at end of the subclause after the text provided in 11-18-0757-02-00ay-Resolution-of-CIDS-related-to-MU-BA-and-RD***

The text below provides addition rules for the RD responder that constructs multi-TID A-MPDU in response to the MU PPDU.

A non-AP and non-PCP EDMG STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true shall not send a multi-TID A-MPDU to an EDMG AP unless all the following conditions are met

* the EDMG Multi-TID Aggregation Support is greater than 0 in the EDMG MAC Capability data field of the AP
* the RDG/More PPDU bit is set to one in the QoS control filed of all MPDU(s) in the EDMG MU PPDU the AP transmitted
* the TID Aggregation Limit field of the Block Ack Schedule frame addressed to the STA in the EDMG MU PPDU is nonzero.

The EDMG STA may aggregate in a multi-TID A-MPDU QoS Data frames with multiple TIDs as defined in Table 9-425 (A-MPDU contents in the data enabled immediate response context) or Table 9-426 (A-MPDU contents in the data enabled no immediate response context).

The number of different TID values for QoS Data frames in the multi-TID A-MPDU shall not exceed the value in the TID Aggregation Limit subfield in the Block Ack Schedule frame the EDMG STA received in the MU PPDU. The multi-TID A-MPDU may contain no more than one Management frame except Action no Ack. Any number of QoS Null frame with any TID with which the Ack Policy field is set to No Ack may be aggregated in the A-MPDU regardless of the value of the TID Aggregation Limit subfield and the value of the Preferred AC subfield in the Block Ack Schedule frame.

NOTE—A QoS Null frame with the Ack Policy field set to Normal Ack or Implicit Block Ack Request is not allowed to be sent in an A-MPDU (as defined in Table 9-425 (A-MPDU contents in the data enabled immediate response context), Table 9-426 (A-MPDU contents in the data enabled no immediate response context) and Table 9-428 (A-MPDU contents MPDUs in the control response context)).

The Multi-TID BlockAck frame shall be used to acknowledge the MPDUs in a multi-TID A-MPDU. The rules for Multi-TID BlockAck are defined in subclause 10.63 (EDMG A-MPDU with multiple TIDs)**.**

The EDMG STA in role of RD responder that constructs multi-TID A-MPDU in response to the MU PPDU shall aggregated MPDUs in the A-MPDU in the following order:

* MPDUs from any one of the TIDs from the same AC or higher AC as indicated in the Preferred AC subfield of the Block Ack schedule frame.
* MPDUs for a TID belonging to any other AC in that A-MPDU carried in the MU PPDU if the responding EDMG STA has no buffered MPDU for TIDs belonging to the same or higher priority AC indicated in the Preferred AC subfield
* MPDUs from TIDs in other ACs within the remaining time of the Response Duration value indicated in the Block Ack Schedule Information field of the received Block Ack Schedule frame.

**10.63.1 General**

P248L23

***TGay Editor modify as follows (D1.2)***

When a multi-TID A-MPDU is sent in response to an MPDU conveyed in SU PPDU …

1. IEEE P802.11ay/D1.2, April 2018
2. IEEE P802.11-REVmd/D1.0, February 2018