IEEE P802.11  
Wireless LANs

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| EDMG Multi-TID Aggregation Support | | | | |
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Abstract

This document proposes modified draft for the sections that relate to EDMG Multi-TID Aggregation support.

**9.4.2.250 EDMG Capabilities element**

**9.4.2.250.1 General**

*Change table 2 – Capability IDs as follows*

**Table 2—Capabilities IDs**

|  |  |
| --- | --- |
| **Capability** | **Capabilities ID** |
| Beamforming | 0 |
| Multi-BF | 1 |
| Antenna Polarization Capability | 2 |
| PHY Capability | 3 |
| Supported Channels | 4 |
| EDMG Multi-TID | TBD |

**9.4.2.250.6 Multi-TID field**

The EDMG Multi-TID capability field is defined in Figure TBD

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | |
|  | EDMG Multi-TID Aggregation Support | | EDMG Multi-TID Block-Ack Support |
| Bits: | 4 | | 4 |

**Figure TBD— EDMG Multi-TID capability field format**

The EDMG Multi-TID A-MPDU Support subfield is defined in Table TBD

|  |  |  |
| --- | --- | --- |
| Subfield | Definition | Encoding |
| EDMG Multi-TID Block-Ack Support | Indicates the number of TIDs can be supported by STA in EDMG Multi-TID BlockAck. | Set to the number of supported TIDs minus 1,  Setting the subfield to ‘0’ indicates that STA do not support EDMG Multi-TID BlockAck format |
| EDMG Multi-TID Agregation Support | Indicates the number of TIDs of QoS Data frames that an EDMG STA can receive or aggregate in a multi-TID A-MPDU as described in TBD (EDMG A-MPDU with multiple TIDs). | Set to the number of TIDs minus 1 of QoS Data frames that EDMG STA can receive or aggregate in a multi-TID A-MPDU  Setting the subfield to ‘0’ indicates that STA do not support EDMG Multi-TID Aggregation. |

**9.7.3 A-MPDU contents**

***Add the following paragraph after the last paragraph***

A-MPDU carried in an EDMG PPDU can include MPDUs with different values of the TID field as described in 10.13.XYZ (EDMG A-MPDU with multiple TIDs).

***Change Table 9-425 (A-MPDU contents in the data enabled immediate response context) as follows:***

**Table 9-425—A-MPDU contents in the data enabled immediate response context**

|  |  |  |
| --- | --- | --- |
| **MPDU Description** | **Conditions** | |
| Ack | If the preceding PPDU contains an MPDU that requires an Ack frame response, a single Ack frame at the start of the A-MPDU. | In a non-DMG STA: at most one of these Ack and HT-immedi ate BlockAck MPDUs is present.  In a DMG STA: at most one Ack frame is present, and zero or more HT-immediate Block Ack frames are present.  In EDMG STA: at most one Ack frame is present. Zero or more HT-immediate Block Ack or zero or more EDMG Multi-TID Block Ack frames are present but not both Block Ack variants in the same A-MPDU. |
| HT-immediate BlockAck | In a non-DMG STA: if the preceding PPDU contains an implicit or explicit block ack request for a TID for which an HT-immediate block ack agreement exists, at most one BlockAck frame for this TID, in which case it occurs at the start of the A-MPDU.  In a DMG STA: if the preceding PPDU contains an implicit or explicit block ack request for a TID for which an HT-immediate block ack agreement exists, one or more copies of the same BlockAck for this TID. |
| EDMG Multi-TID BlockAck | In a EDMG STA: If the preceding PPDU that carried a multiple-TID A-MPDU contains implicit or explicit block ack requests for multiple TIDs for which HT immediate block ack agreement exist, one or more copies of the same Multi-TID BA frame. |
| Delayed BlockAcks | BlockAck frames with the BA Ack Policy subfield equal to No Acknowledgment with a TID for which an HT-delayed block ack agreement exists. | |
| Delayed block ack data | QoS Data frames with a TID that corresponds to a Delayed or HT-delayed block ack agreement. These have the Ack Policy field equal to Block Ack. | |
| Action No Ack | Action No Ack frames. | |
| Delayed BlockAckReqs | BlockAckReq frames with a TID that corresponds to an HT-delayed block ack agreement in which the BA Ack Policy subfield is equal to No Acknowledgment. | |
| Data frames without HT immediate block ack agree ment | QoS Data frames with multiple TIDs which have no HT-immediate block ack agreement See NOTE 1. | Of these, at most one of the following is present in a non-DMG BSS: — One or more QoS Data frames with the Ack Policy field equal to Implicit Block Ack Request — A BlockAckReq frame  Of these, at most one of the following is present in a DMG BSS: — One or more QoS Data frames with the Ack Policy field equal to Implicit Block Ack Request — QoS Null MPDU with Ack Policy set to No Ack — A BlockAckReq frame with an optional QoS Null MPDU with Ack Policy set to No Ack  Of these, any of the following is present for EDMG STA:   * One or more QoS Data frames with different TIDs and at the most one Action frame. * One or more QoS Null MPDU with Ack Policy set to No Ack. * One of BlockAckReq or Multi TID BlockAckReq frame but not both in same A-MPDU. |
| Data frames sent under an HT immediate block ack agree ment | QoS Data frames with the same TID, which corresponds to an HT-immediate block ack agreement.  QoS Data frames with multiple TIDs, which correspond to multiple HT-immediate block ack agreements. |
| QoS Null MPDUs with Ack Policy set to No Ack | In a DMG BSS, QoS Null MPDUs with Ack Policy set to No Ack. |
| Immediate BlockAckReq | At most one BlockAckReq frame with a TID that corresponds to an HT-immediate block ack agreement.  It is not present if any QoS Data frames for that TID are present.  Multi-TID BlockAckReq frame with TIDs that correspond to an HT-immediate block ack agreement. It is not present if any QoS Data frames for those TIDs are present.  This is the last MPDU in the A-MPDU. |
| Action | At most one Action frame |
| NOTE—These MPDUs all have the Ack Policy field equal to the same value, which is either Implicit Block Ack  Request or Block Ack. | | |

***Change Table 9-428 (A-MPDU contents MPDUs in the control response context) as follows:***

**Table 9-428—A-MPDU contents MPDUs in the control response context**

|  |  |  |
| --- | --- | --- |
| **MPDU** | **Conditions** | |
| Ack | Ack frame transmitted in response to an MPDU that requires an Ack frame. | One of these is present at the start of the A-MPDU. |
| BlockAck | BlockAck frame with a TID that corresponds to an HT-immediate block ack agreement. |
| EDMG Multi-TID BlockAck | If the preceding PPDU that carried multi-TID A-MPDU contains implicit or explicit block ack requests for multiple TIDs for which HT immediate block ack agreement exist, one or several copies of the same EDMG Multi-TID BlockAck frame. |
| Action No Ack | +HTC Action No Ack frames carrying a Management Action Body containing an explicit feedback response or BRP frame. | |

**10.13.TBD (New Section): EDMG A-MPDU with multiple TIDs**

A multi-TID A-MPDU is an A-MPDU that contains QoS Data frames with two or more different TID values.

An EDMG STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true shall set the EDMG Multi-TID  
Aggregation Support subfield of the EDMG Capabilities element it transmits to a nonzero value and shall set the value of EDMG Multi-TID Block-Ack Support to be equal or greater than EDMG Multi-TID Aggregation Support subfield value. Otherwise, the EDMG STA shall set it to 0.

An EDMG STA shall not send a multi-TID A-MPDU to EDMG STA that has the EDMG Multi-TID Aggregation Support subfield in the EDMG Capabilities element equal to 0. The number of different TID values in the multi-TID A-MPDU shall not exceed the number specified by the intended recipient in the Multi-TID Aggregation Support field of the EDMG Capabilities element.

An EDMG STA that receives a Multi-TID A-MPDU with QoS-Data frames of different TIDs with Ack Policy is set to Implicit Block Ack shall respond with EDMG Multi-TID BlockAck frame.

An EDMG STA may aggregate in a Multi-TID A-MPDU QoS Data frames with different TIDs 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) or Table 9-428 (A-MPDU contents MPDUs in the control response context).

A multi-TID A-MPDU transmitted in an EDMG SU PPDU may contain one or more MPDUs with any of the TIDs that correspond only to the AC that is used to gain access to the medium.

An EDMG AP may aggregate MPDUs from any TIDs in Multi-TID A-MPDU for DL MU PPDU transmission and the number of TIDs in Multi-TID A-MPDU shall not be more than the EDMG Multi-TID Aggregation Support announced by the recipient.

**SP**: Do you agree to include the text proposed in this document into the 802.11ay draft spec?