IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CR on MU BA and RD | | | | |
| Date: 2019-05-13 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Ilya Bolotin | Intel |  |  | ilya.bolotin@intel.com |

Abstract

This document proposes resolution for the following CIDs: 4387, 4388, 4389, 4437, 4438, 4440, 4441, 4442.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4387 | 206.24 | 10.3.2.13 | "An EDMG STA that is DL MU-MIMO capable may set the EDMG Multi-TID Aggregation Support subfield of its EDMG Capabilities element to a nonzero value."  What is the significance of this sentence, it can be indicated for any capability field. Suggest to remove it. | As in comment |

**Proposed resolution:** **Accept**

**Discussion:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4388 | 206.20 | 10.3.2.13 | "An MU-MIMO initiator may transmit an MPDU with TID for which a BlockAck agreement does not exist."  This statement is true only in case of Multi-TID aggregation, need to specify it | Change to :  An EDMG STA that is DL MU-MIMO capable shall support the Multi-TID BlockAck frame. An MU- MIMO initiator may transmit an MPDU with TID for which a BlockAck agreement does not exist embedded in Multi-TID A-MPDU. In this case, the MU-MIMO responder shall respond to the MPDU with a Multi-TID BlockAck frame following the rules defined in 10.73.2. |

**Proposed resolution:** **Reject**

**Discussion:**

The commenter is mistaken. The quoted statement is true not only in case of Multi-TID aggregation. It is also true for EDMG MU-MIMO PPDU which contains A-MPDU which is not multi-TID A-MPDU, as it is said in Section 10.73.2, which is referred here: “A recipient of a **multi-TID A-MPDU** or of an **EDMG MU-MIMO PPDU** …”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4389 | 206.37 | 10.3.2.13 | "An MU-MIMO initiator shall set the value of the Response Duration subfield of the Block Ack Schedule frame equal to the duration of the expected BlockAck frame or EDMG Multi-TID BlockAck frame (see 10.26.5) transmission from a STA addressed by an A-MPDU within a transmitted MU PPDU calculated using the lowest MCS."  Lowest MCS is MCS0 which is considerably longer from the MCS in which Ack will be transmitted in practice. consider to provide other practical rule or to change the rule to "should" | As in comment |
| 4437 | 206.36 | 10.3.2.13 | "An MU-MIMO initiator shall set the value of the Response Duration subfield of the Block Ack Schedule frame equal to the duration of the expected BlockAck frame or EDMG Multi-TID BlockAck frame (see 10.26.5) transmission from a STA addressed by an A-MPDU within a transmitted MU PPDU calculated using the MCS 0 as specified in 10.6.7.2" The subclause 10.6.7.2 does not limit the BlockAck and Multi-TID BlockAck to be sent by MCS 0. | Either provide reference to the specific case in 10.6.7.2 that requires MCS 0 due to delivery of spatial stream feedback, or remove the requirement of using the MCS0. |

**Proposed resolution:** **Revise**

**Discussion:**

The requirement for usage of the lowest MCS during calculation of the allocated period for STA response was added to ensure that STA would not exceed this period and will not interfere the following transmissions.

However, if an MU-MIMO initiator knows that responder shall use higher MCS (e.g. from recently done link measurements), it would be good if it could allocate shorter period saving the medium time. For this purpose agree to change “shall” rule to “should”. Also agree to remove reference to subclause 10.6.7.2.

Propose to change the phrase as follows:

“An MU-MIMO initiator shall set the value of the Response Duration subfield of the Block Ack Schedule frame equal to the duration of the expected BlockAck frame or EDMG Multi-TID BlockAck frame (see 10.26.5) transmission from a STA addressed by an A-MPDU within a transmitted MU PPDU. The value of the expected transmission should be calculated using the MCS 0 ~~as specified in 10.6.7.2~~.”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4438 | 207.07 | 10.3.2.13 | "If an MU-MIMO initiator does not intend to elicit a BlockAck frame or EDMG Multi-TID BlockAck frame from a STA addressed by an A-MPDU within a transmitted MU PPDU, it shall set the values of the Response Offset field and Response Duration field within the frame to 0." The rule introduces inconsistence that the Ack Policy = scheduled Ack in the MPDU is not always associated with BlockAck response. | Propose to add condition about the ack policy field: "If an MU-MIMO initiator does not intend to elicit a BlockAck frame or EDMG Multi-TID BlockAck frame from a STA addressed by an A-MPDU within a transmitted MU PPDU, it shall not set the ack policy field equal to Scheduled Ack and shall set the values of the Response Offset field and Response Duration field within the frame to 0." |

**Proposed resolution:** **Revise**

**Discussion:**

Agree with the commenter. Propose to add more clear condition about the Ack Policy rule:

“If an MU-MIMO initiator does not intend to elicit a BlockAck frame or EDMG Multi-TID BlockAck frame from a STA addressed by an A-MPDU within a transmitted MU PPDU, it shall set the Ack Policy field equal to No Ack or Block Ack as it is defined in Table 9-13 (Ack Policy) and shall set the values of the Response Offset field and Response Duration field within the frame to 0.”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4440 | 236.20 | 10.30.3 | "For a STA that is not an EDMG STA, a QoS Data frame with the Ack Policy field equal to any value except PSMP Ack (i.e., including Implicit Block Ack Request), or..." The rule is true for all DMG STA, not only EDMG | Replace EDMG by DMG, same in the line 22 |

**Proposed resolution:** **Revise**

**Discussion:**

With the current text the reader may assume that the Ack Policy = Scheduled Ack is supported by the non-EDMG STA or Ack Policy = PSMP Ack is supported by EDMG STA, which is wrong. Propose to add more explicit definition:

“An RDG shall not be present unless the MPDU carrying the grant, or every MPDU carrying the grant in an A-MPDU, matches one of the following conditions:

- For a STA that is not an EDMG STA, a~~A~~ QoS Data frame with the Ack Policy field equal to any value except PSMP Ack or Scheduled Ack (i.e., including Implicit Block Ack Request), or

- For an EDMG STA, a QoS Data frame with the Ack Policy field equal to any value except PSMP Ack, or

- A BlockAckReq frame related to an HT-immediate block ack agreement, or

- An MPDU not needing an immediate response (e.g., block ack under an HT-immediate block ack agreement, or Action No Ack).”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4441 | 236.23 | 10.30.3 | "-- A BlockAckReq frame related to an HT-immediate block ack agreement, or -- An MPDU not needing an immediate response (e.g., block ack under an HT-immediate block ack 24 agreement, or Action No Ack)." both rules are not applicable for the DMG STA | In both sentences insert at the start of the sentence "For an non-DMG STA," |

**Proposed resolution:** **Accept**

**Discussion:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** |
| 4442 | 1881.06 | 10.30.4 | In reference to IEEE P802.11-REVmd/D2.1, February 2019. "-- Transmitting a control response frame that contains no HT Control field" The rule is not applicable for the DMG STA | Modify as follows: -- For a non-DMG STA transmitting a control response frame that contains no HT Control field --For a DMG STA transmitting a control response frame that contains no QoS control field |

**Proposed resolution:** **Revise**

**Discussion:**

Agree with the commenter except the second proposed phrase - QoS control field is not present in control response frames. Propose the following text changes:

“The recipient of an RDG may decline the RDG by  
— Not transmitting any frames following the RDG PPDU when no response is otherwise required, or  
— For a non-DMG STA, ~~T~~transmitting a control response frame with the RDG/More PPDU subfield set to 0, or  
— For a non-DMG STA, ~~T~~transmitting a control response frame that contains no HT Control field”

Proposed text changes for TGay editor:

**10.3.2.12 MU acknowledgment procedure**

*Insert the following paragraphs before the last paragraph (NOTE 2)*

An EDMG STA indictates that it is DL MU-MIMO capable by setting the MU-MIMO Supported subfield in the STA’s EDMG Capabilities element to 1. An EDMG MU-MIMO initator shall not transmit an EDMG MU-MIMO PPDU to an EDMG STA that does not have the MU-MIMO Supported subfield equal to 1.

An EDMG STA that is DL MU-MIMO capable shall support the Multi-TID BlockAck frame. An MU-MIMO initiator may transmit an MPDU with TID for which a BlockAck agreement does not exist. In this case, the MU-MIMO responder shall respond to the MPDU with a Multi-TID BlockAck frame following the rules defined in 10.73.2.

An EDMG STA that is DL MU-MIMO capable and that has the EDMG Multi-TID Aggregation Support subfield of its EDMG Capabilities element set to a nonzero value:

* May set the EDMG All Ack Support subfield in the STA’s EDMG Capabilities element to 1; and
* Shall follow rules defined in 10.73.

The acknowledgment procedure performed by EDMG STAs that receive an MPDU within an EDMG MU PPDU from an MU-MIMO initiator shall follow the schedule defined by the MU-MIMO initiator.

An MU-MIMO initiator shall set the ack policy of MPDUs contained in each A-MPDU transmitted within an EDMG MU PPDU to Scheduled Ack and shall include at least one Block Ack Schedule frame in each A-MPDU transmitted within an EDMG MU PPDU. Each Block Ack Schedule frame shall contain the scheduling information for the EDMG STA which is an intended receiver of the A-MPDU. An MU-MIMO initiator shall set the value of the Response Duration subfield of the Block Ack Schedule frame equal to the duration of the expected BlockAck frame or EDMG Multi-TID BlockAck frame (see 10.26.5) transmission from a STA addressed by an A-MPDU within a transmitted MU PPDU. The value of the expected transmission should be calculated using the MCS 0. The values of all subfields of the Block Ack Schedule frame shall not change if transmitted multiple times in the same A-MPDU. An MU-MIMO initiator shall set the value of the Response Offset subfield of the Block Ack Schedule frame to SIFS in an A-MPDU transmitted to a STA that is expected to be the first responder.

An EDMG STA shall transmit a BlockAck frame or EDMG Multi-TID BlockAck frame in response to a received EDMG MU PPDU immediately after a period of time equal to the value of the Response Offset subfield from the end of EDMG MU PPDU. The Response Offset subfield is contained in the Block Ack Schedule frame within the MU PPDU.

If an MU-MIMO initiator does not intend to elicit a BlockAck frame or EDMG Multi-TID BlockAck frame from a STA addressed by an A-MPDU within a transmitted MU PPDU, it shall set the Ack Policy field equal to No Ack or Block Ack as it is defined in Table 9-13 (Ack Policy) and shall set the values of the Response Offset field and Response Duration field within the frame to 0.

…

**10.30.3 Rules for RD initiator**

*Change the first paragraph as follows*

An RDG shall not be present unless the MPDU carrying the grant, or every MPDU carrying the grant in an A-MPDU, matches one of the following conditions:

⎯ For a STA that is not an EDMG STA, a~~A~~ QoS Data frame with the Ack Policy field equal to any value except PSMP Ack, No explicit acknowledgement or Scheduled Ack (i.e., including Implicit Block Ack Request), or

⎯ For an EDMG STA, a QoS Data frame with the Ack Policy field equal to any value except PSMP Ack or No explicit acknowledgement, or

⎯ For a non-DMG STA, ~~Aa~~ BlockAckReq frame related to an HT-immediate block ack agreement, or

⎯ For a non-DMG STA, ~~A~~an MPDU not needing an immediate response (e.g., block ack under an HT-immediate block ack agreement, or Action No Ack).

…

**10.30.4 Rules for RD responder**

*Change the first paragraph and insert a new one as follows*

If an RDG was granted by an MPDU contained in an A-MPDU with the ack policy different than Scheduled Ack, an ~~An~~ RD responder shall transmit the initial PPDU of the RD response burst a SIFS after the reception of the RDG PPDU. PPDUs in a response burst are separated by SIFS or RIFS. The RIFS rules in the RD are the same as in the forward direction; the use of RIFS is constrained as defined in 10.3.2.3.2 (RIFS) and 10.28.3.3 (RIFS protection).

If an RDG was granted by an MPDU contained in an A-MPDU with the ack policy equal to Scheduled Ack, an RD responder shall transmit the initial PPDU of the RD response burst at a time equal to *T\_Offset* from the end of RDG PPDU, where *T\_Offset* is the value of Response Offset subfield of the Block Ack Schedule frame in the A-MPDU which has the MPDU that granted the RDG. The duration of the RD response burst shall not exceed the the value of Response Duration subfield of the Block Ack Schedule frame in the A-MPDU which has the MPDU that granted the RDG.

*Change the third paragraph as follows*

The recipient of an RDG may decline the RDG by

— Not transmitting any frames following the RDG PPDU when no response is otherwise required, or

— For a non-DMG STA, ~~T~~transmitting a control response frame with the RDG/More PPDU subfield set to 0, or

— For a non-DMG STA, ~~T~~transmitting a control response frame that contains no HT Control field”

…

References

1. Draft P802.11ay\_D3.0
2. Draft P802.11REVmd\_D2.1

**Straw Poll:**

* **Do you agree to accept comment resolutions as proposed in doc 11-19/0670r1?**