### IEEE P802.11 Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 11ax D3.0 MAC Comment Resolution for Control response | | | | |
| Date: 2018-08-08 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Robert Stacey | Intel | 2200 Mission College Blvd, Santa Clara, CA 950542200 |  | robert.stacey@intel.com |
| Po-Kai Huang |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for comments of TGax Draft D3.0 with the following CIDs:

16687, 16688 and 16689

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 D3.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D3.0 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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 16688 | Robert Stacey | 366.16 | 27.15.3 | This statement is unecessary. There could be a large power assymmetry between an AP and a non-AP STA (e.g., AP has 23 dBm output power and non-AP STA has 0 dBm output power), with the rsult that the AP could use a much higher MCS than MCS0 in response to an HE ER SU PPDU. The rate selection should be up to the recipient. We can have some consistency requirements so that the initiator can learn the rate over time. | Change the title of this subclause to "HE multirate support". Remove this bullet and add rules in subsequent paragraphs that for control frame responses to accommodate large power assymetries. In particular, allow response MCS to be higher than received MCS. Allow non-HT PPDU in response to HE ER SU PPDU. The rules would be something like the MCS can be less than or equal to the MCS used for data in the return parth. | Revised –  Agree in principle with the commenter. We revise the bullet in 27.15.2 about format selection. We also revise the corresponding sentence in 27.15.3 for data rate selection.  TGax editor to make the changes shown in 11-18/xxxxr0 under all headings that include CID 16688. |
| 16687 | Robert Stacey | 366.16 | 27.15.3 | This needs to be two separate statements because 6 Mb/s is not an MCS (it's a rate) and is implicitly 1 SS. | Change to "- A Control frame carried in an HE ER SU PPDU that is a response to a frame received in an HE ER SU PPDU shall use the <HE-MCS, NSS> tuple <MCS0, 1>. - A Control frame carried in a non-HT PPDU that is a response to a frame received in an HE ER SU PPDU shall use rate 6 Mb/s." | Revised –  Agree in principle with the commenter. We revise the bullet in 27.15.2 about format selection. We also revise the corresponding sentence in 27.15.3 for data rate selection.  TGax editor to make the changes shown in 11-18/xxxxr0 under all headings that include CID 16688. |
| 16689 | Robert Stacey | 367.28 | 27.15.3 | This statement is incompatible with the statement at P365L50. It also does not account for the capabilities of the receiver. | Remove statement. Add more general rules that leave MCS, NSS and DCM selection for control responses up to the responder. | Revised –  Agree in principle with the commenter. We revise the bullet in 27.15.2 about format selection. We also revise the corresponding sentence in 27.15.3 for data rate selection.  TGax editor to make the changes shown in 11-18/xxxxr0 under all headings that include CID 16688. |

# Discussion

The comments identify problems with using the HE ER SU PPDU for a control response frame. In addition, the following issues need to be addressed:

An HE ER SU PPDU is 20 MHz. Other rules require that the bandwidth of the response be the same as the bandwidth of the soliciting PPDU.

# Editing instructions

***TGax editor: Change 27.15.2 PPDU format selection as follows: (Track change on)***

* PPDU format selection

(…existing texts…)

An HE STA shall send Control frames following the rules defined in 10.7.6 (Rate selection for Control frames)) with the following exceptions:

* A Control frame sent in response to an HE ER SU PPDU or HE SU PPDU that uses STBC shall be carried in the same PPDU format as the soliciting PPDU.
* A Control frame sent by the AP as a response to an HE TB PPDU may be carried in any PPDU format that is supported by the intended receiver(s).
* A Trigger frame that is not an MU-RTS Trigger frame(#13317) may be carried in any PPDU format that is supported by the intended receiver(s).
* A Control frame is carried in an HE TB PPDU if it is sent as a response to a PPDU that contains a Trigger frame that is not an MU-RTS Trigger frame or if it is sent as a response to a PPDU that contains a frame containing a TRS Control subfield(#13136)(#14137) (see 27.5.3 (UL MU operation)).(18/12r3)
* An Ack frame sent as a response to an HE ER SU PPDU or HE SU PPDU containing an FTM frame shall be sent in the same PPDU format as the soliciting PPDU except when the FTM frame is carried in HE SU PPDU and the most recent successfully received PPDU sent by the responding STA to the soliciting STA after association was an HE ER SU PPDU in which case the Control frame shall be carried in HE ER SU PPDU.
* (#16688)(#16688)
* A STA that sends a Control frame that is a response to a frame received in a HE SU PPDU, HE ER SU PPDU or HE MU PPDU may transmit the Control frame as an S-MPDU in an HE ER SU PPDU if the transmission is not in response to a Trigger frame, the HE SU PPDU, HE ER SU PPDU or HE MU PPDU is a 20 MHz PPDU, and the soliciting STA has not disabled reception of HE ER SU PPDUs. Otherwise, the STA shall send the Control frame in a non-HT or non-HT duplicate PPDU.(#16688)

NOTE 1—PPDU format switching between non-HT and ER SU PPDU occurs in subsequent TXOPs. A STA that solicits a Control frame from a responding STA accounts for the PPDU format of the Control frame to calculate the expected duration of the TXOP. The responding STA determines that the most recent PPDU sent to the soliciting STA is successfully received if it receives an immediate acknowledgment by the soliciting STA in response to the PPDU.

***TGax editor: Change 27.15.3 MCS, NSS, BW and DCM selection as follows: (Track change on)***

* MCS, NSS, BW and DCM selection

An HE STA shall follow the rules defined in 10.7 (Multirate support) and 27.15.4 (Rate selection constraints for HE STAs) for selecting the rate, MCS, NSS, and the rules defined in 10.3.2.6 (VHT RTS procedure), 10.3.2.7 (CTS and DMG CTS procedure), 10.7.6.6 (Channel Width selection for Control frames) and 10.7.11 (Channel Width in non-HT and non-HT duplicate PPDUs) for selecting the channel width (BW) of transmitted PPDUs with the following exceptions:

* MCS, NSS, and BW selection for an HE TB PPDU are defined in 27.5.3.3 (STA behavior for UL MU operation).
* Rate and BW selection for a CTS sent in response to an MU-RTS Trigger frame(#13317) are defined in 27.2.5 (MU-RTS/CTS procedure)
* A STA that transmits a non-HT PPDU carrying a Control frame that is a response to a frame received in an HE SU PPDU or HE SU ER PPDU should set the rate of the non-HT PPDU to less than or equal to the data rate of the last PPDU successfully sent to the soliciting STA. If the STA has not successfully sent a PPDU to the soliciting STA, then the STA should set the rate of the non-HT PPDU to 6 Mb/s.(#16688)
* A STA that transmits an HE ER SU PPDU carrying an S-MPDU that is a Control frame that is a response to a frame received in an HE SU PPDU, HE ER SU PPDU or HE MU PPDU, should select an <HE-MCS, NSS> tuple, DCM and RU size for the HE ER SU PPDU such that the data rate is less than or equal to the data rate of the last PPDU successfully sent to the soliciting STA. If the STA has not successfully sent a PPDU to the soliciting STA, then the STA should set the <HE-MCS, NSS> tuple of the HE ER SU PPDU to <MCS0, 1>. DCM may be used if the DCM Max Constellation Rx subfield in the HE PHY Capabilities Information field in the most recently received HE Capabilities element sent by the soliciting STA is greater than 0. A 106-tone RU may be used if the Partial Bandwidth Extended Range subfield in the HE PHY Capabilities Information field in the most recently received HE Capabilities element sent by the soliciting STA is 1.(#16688)
* NSS and BW selection is further constrained as defined in 27.8 (Operating mode indication), 11.42 (Notification of operating mode changes) and 27.15.2 (PPDU format selection).

(… existing texts …)

(#16688)

(… existing texts …)