### IEEE P802.11Wireless LANs

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| 11ax D1.3 MAC Comment Resolution for CID 5772, 9476, 9480 |
| Date: 2017-07-25 |
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Abstract

This submission proposes resolutions for comments of TGax Draft 1.3 with the following CIDs:

5772, 9476, 9480

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Editorial revision for the resolution.
* Rev 2: Revision for the explanation of the resolution.
* Rev 3: Baed on the comment from Mark, revise the explanation for the resolution and add a sentence saying the power management bit is set to 0 for CTS response to MU-RTS. Based on the commen from Abhi, add the normative behavor for CTS response when RU allocation field is not defined.

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 D1.3 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D1.3 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.***

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5772 | Hanseul Hong | 117.11 | 10.3.2.8a.2 | Is it possible to transmit MU-RTS in HT PPDU or VHT PPDU format? | Clarify | Revised –MU-RTS can be carried in HT PPDU or VHT PPDU except VHT MU PPDU based on the agreement for CID 7975. The reason why MU-RTS can not be carried in VHT MU PPDU is the following. MU-RTS solicits non-HT CTS response, and if in another PPDU there are other type of frame like Trigger frame that solicits different response, the response my not be even decoded by the AP, and corresponding rules may need to be specified such that MU-RTS can be used with other responses in this case. Since we do not see why we need to add a couple of rules to enable a use case where there is no benefits, we then disallow MU-RTS to be carried in VHT MU PPDU or HE MU PPDU.TGax editor to make the changes shown in 11-17/0264r3 under all headings that include CID 7975. |
| 9480 | xun yang | 113.45 | 10.3.1 | Is MU-RTS under control of dot11RTSThreshold? If yes, please add the related text; if not, please clarify which parameter to control MU-RTS. | As in the comment. | Rejected –MU-RTS/CTS is not under control of dot11RTSThreshold. We note that based on the concept of dot11RTSThreshold, it is used to control the exchange of single user transmission, and the value of dot11RTSThreshold may be set under per-STA basis. Since MU-RTS/CTS is used for protection of MU transmission, which will include many complicated scenarios, it is then not appropriate to use the threshold that controls per-STA transmission for the protection. Further, we also do not see the need to invent additional mechanism for the control. Use of MU-RTS/CTS can be just implementation specific based on the specific consideration of MU sequence that is used by the vendor.  |
| 9476 | xun yang | 33.01 | 9.3.1.3 | For simultaneous CTS (MU RTS/CTS procedure), the CTS transmitted by non-AP STA shall be the same. However, the values of several subfields in Frame Control of CTS are unclear, e.g., power management subfield is reserved, no text on how to set More Data field, etc.This does not matter when CTS is transmitted one by one; but different values will causes interference when these CTSs are transmited simultaneously. | Please ensure that all the CTS frame are the same when they are triggered by MU-RTS. | Revised –Agree in principle with the commenter. The commenter is asking for a review of all the fields in frame control field to make sure that every STA will respond with the same CTS. The frame control field includes the following subfields.* Protocol Version
* Type
* Subtype
* To DS
* From DS
* Moe Fragments
* Retry
* Power Management
* More data
* Protected Frame
* +HTC/Order

Based on Figure 9-19, To DS, From DS, More Frag, Retry, Protected Frame, and +HTC/Order are set to 0 in control frame.For protocol version subfield, we have the following spec texts.*For this standard, the value of the protocol version is 0.*Type and subtype are defined for CTS frame.For More data subfields, we have the following spec texts to show that it is set to 0 in CTS frame.*A non-DMG STA uses the More Data subfield to indicate to a STA in PS mode that more BUs are buffered for that STA at the AP. The More Data subfield is valid in individually addressed Data or Management frames transmitted by an AP to a STA in PS mode. A value of 1 indicates that at least one additionalbuffered BU is present for the same STA.**… (existing texts) …**A non-DMG STA sets the More Data subfield to 0 in all other individually addressed frames.*For power management field, based on the texts in 9.2.4.1.7 and 11.2.3, power management field in CTS frame is not valid. If “not valid” means reserved, then the power management field is set to 0 based on the texts in 9.2.2. However, the spec does not have description for the definition of “not valid”. Hence, corresponding texts are added.*The Power Management subfield is 1 bit in length and is used to indicate the power management mode of a STA. The value of this subfield is either reserved (as defined below) or remains constant in each frame froma particular STA within a frame exchange sequence (see Annex G). The value indicates the mode of the STA after the successful completion of the frame exchange sequence.In an infrastructure BSS or PBSS, the following applies:— The Power Management subfield is valid only in frame exchanges as described in 11.2.3 and 11.2.7. In such exchanges, a value of 1 indicates that the STA will be in PS mode. A value of 0 indicates that the STA will be in active mode.— The Power Management subfield is reserved in all Management frames transmitted by a STA to an AP or PCP with which it is not associated.— The Power Management subfield is reserved in all frames transmitted by the AP.*Also, revise the normative behaviour such that the CTS is not sent if the RU allocation field is not defined. TGax editor to make the changes shown in 11-17/1183r3 under all headings that include CID 9476. |

**Discussion:** *None.*

**Propose:** Revised for CID 9476 per discussion and editing instructions in 11-17/1183r3.

***TGax editor: Add the red sentence in 27.2.4.3 CTS response to MU-RTS as the following:***

If an HE STA receives an MU-RTS Trigger frame(#9481), the HE STA shall commence the transmission of
a CTS frame response at the SIFS time boundary after the end of a received PPDU when all the following
conditions are met:

* The MU-RTS Trigger frame(#9481) has one of the User Info fields addressed to the STA. The User Info field is addressed to a STA if the AID12 subfield is equal to the AID of the STA and the MURTS Trigger frame is sent by the AP with which the STA is associated with or by the AP corresponding to the transmitted BSSID if STA has indicated support for receiving Control frames with TA set to the Transmitted BSSID (Rx Control Frame To MultiBSS set to 1 in HE Capabilities element).(#7569)
* The UL MU CS condition indicates that the medium is idle (see 27.5.2.4 (UL MU CS mechanism)).
* The RU Allocation subfield in the User Info field addressed to the STA indicates primary 20 MHz channel, primary 40 MHz channel, primary 80 MHz channel,160 MHz channel, or 80+80 MHz channel. (#9476)

Otherwise, the STA shall not send a CTS frame response.(#9850, #8411, #7569)

NOTE—The ED-based CCA during the SIFS after receiving an MU-RTS Trigger frame and virtual CS functions are
used to determine the state of the medium to respond to an MU-RTS Trigger frame. See 27.5.2.4 (UL MU CS mechanism) for details.(#8411)

The CTS frame sent in response to an MU-RTS Trigger frame(#9481) shall be carried in a non-HT or nonHT duplicate PPDU (see Clause 17)(#5934).

A non-AP HE STA(#6256) transmitting a CTS frame in response to an MU-RTS Trigger frame(#9481) shall
set the TXVECTOR parameter SCRAMBLER\_INITIAL\_STATE to the same value as the RXVECTOR
parameter SCRAMBLER\_INITIAL\_STATE of the received MU-RTS Trigger frame(#9481). The data rate
to be used for the non-HT or non-HT duplicate PPDU(#5761) response shall be 6 Mb/s.(#5934)

A CTS frame sent in response to an MU-RTS Trigger frame(#9481) shall be transmitted on the 20 MHz
channels indicated in the RU Allocation subfield of the User Info field of the MU-RTS Trigger
frame(#9481).(#8256)

The Power Management subfield in a CTS frame sent in response to an MU-RTS Trigger frame(#9481) shall be set to 0.

NOTE-The subfields within the Frame Control field of Control frames are set as illustrated in Figure 9-19.

More Data subfield is set to 0 in a CTS frame (see 9.2.4.1.8 More Data subfield).