IEEE P802.11
Wireless LANs

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| MU-RTS/CTS Rate Comment Resolution |
| Date: 2016-09-12 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D0.1 with the following CIDs:

* 863, 219, 411, 2380, 2609, 671, 2115, 986, and 734

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

***Editing instructions formatted like this are intended to be copied into the TGax 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** | **PP** | **LL** | **Comment** | **Proposed Change** | **Resolution** |
| 863 | 45 | 1 | In Per User Info field within HE Trigger frame format, MCS subfield is defined for each STA. MU-RTS is delivered in MU-RTS variant HE Trigger frame format, therefore AP can explicitly signal MCS level of simultaneous CTS. It would be beneficial for AP to explicitly signal the common MCS level of simultaneous CTSs from multiple STAs (not relying on each STA's individual rate selection algorithm). | Change the text in line 1:Within a MU RTS/CTS exchange, the simultaneous CTS shall be transmitted with the MCS contained in MCS subfield in Per User Info field of the MU-RTS frame that triggers the simultaneous CTS. | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r1. |
| 219 | 63 | 1 | "Within a MU RTS/CTS exchange, the simultaneous CTS shall be transmitted with the primary rate based on the rate or MCS of the MU-RTS frame that triggers the simultaneous CTS."the AP indicates the rate of transmission in the trigger frame, change this sentence accordingly. | As in comment. | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r1. |
| 411 | 45 | 4 | "BSSBasicRateSet" | What if a STA is outside the BSS? Isn't just going to the mandatory rate set safer? And while we're at it, make all 11a rates mandatory for the purposes of HE | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r1. |
| 2380 | 33 | 17 | Why the simultaneous CTS does not use the MCS rate specified in HE-SIG-A of Common Inf Field of the MU-RTS frame? |  | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r0. |
| 2609 | 45 | 1 | As a MU-RTS frame is a variant of a Trigger frame, the MU-RTS frame has separate MCS subfield for each Per User Info field. Therefore, as long as an AP indicates the same MCS for MCS subfield of Per User Info field of all participating STAs, there's no problem of each participating STA using different MCS level before RF combining. Therefore, as MU-RTS frame is a variant of a Trigger frame, there's no reason to restrict the MCS of simultaneous CTS frame to be the primary rate. | Delete the first paragraph of page 45, and delete the last sentence of (page 41 line 19) in subclause 10.3.2.8a.3. | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r1. |
| 671 | 41 | 14 | Using non-HT or non-HT duplicate to send CTSs by multiple STAs in response to MU-RTS, will cause collision in primary channels (20/40/80) (a technical contribution will be followed later) | Add restrictions to limit to at most one STA to use non-HT or non-HT duplicate to send CTS in response to MU-RTS | Rejected –Capability to receive simultaneous CTS has been demonstrated in 15/867 and 15/806. Hence, more than one STA can send CTS in response to MU-RTS with non-HT or non-HT duplicate PPDU |
| 2115 | 41 | 14 | CTS responses from different STA to MU-RTS may coincide in both time and frequency in the air (Figure 10-3). In the case where the CTS response is non-HT, this must mean the HE-Trigger\_based PPDU requirements on CFO/SFO/Power/Timing do not apply here. Is this good enough for demodulation by sender of MU-RTS? | Clarification | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r0. |
| 986 | 45 | 08 | "the previous frame"is not clear. | Suggest to change to "the previous MU-RTS frame" | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r1. |
| 734 | 45 | 5 | What is a previous MU-RTS frame? Is it a frame that the STA has previously transmitted? How long ago? Or is it a frame that the STA has previously received? Or something else? | Please clarify what is meant with previous MU-RTS. | **Revised.**Agree in principal. TGax editor makes changes as shown in the as specified in 11-16/1183r1. |

10.3.2.8a MU RTS/CTS procedure

10.3.2.8a.3 CTS Repsonse to MU-RTS

***TGax Editor: change the 3rd paragraph as following(863, 219, 411, 2380, 2609):***

The Scrambler Initialization in the SERVICE field of the CTS sent in response to an MU-RTS frame shall be copied from the Scrambler Initialization in the SERVICE field of the MU-RTS frame. The data rate to be used for the non-HT PPDU response that shall be 6Mb/s (see subclause 17.1.1 General).

***TGax Editor: Add the following paragraph at the end of 10.3.2.8a.3(2115):***

A STA that transmit CTS in responding MU-RTS shall follow the synchronization requirement as defiend in subclause 17.3.9.10.

10.7.6.5.2 Selection of a rate or MCS

***TGax Editor: remove the following paragraph from subclause 10.7.6.5.2(863, 219, 411, 2380, 2609):***

**9.3.1.23.2 MU-RTS variant**

***TGax Editor: add the following paragraph from subclause 10.7.6.5.2(863, 219, 411, 2380, 2609):***

The MCS subfield is reserved.

**17.2.2 TXVECTOR parameters**

**17.2.2.1 General**

***TGax Editor: add the following parameter to Table 17-1(2115):***

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|  TRIGGER\_RESPONDING | PHY-TXSTART.request(TXVECTOR) | If present, False, True. When true, the MAC entity requests that the PHYentity does synchronization as defined in 17.3.9.10.; when false, the MAC entity requests thatthe PHY entity does not have to do synchronization as defined in 17.3.9.10.. |

***TGax Editor: add the following subclause at the end of 17.2.2(2115):***

**17.2.2.6 TRIGGER\_RESPONDING**

If present, the allowed values are false or true. A parameter value of true indicates that the MAC sublayer is requesting

that the PHY entity does synchronization as defined in 17.3.9.10. A parameter value of false indicates

that the MAC sublayer is requesting that the PHY entity does not do synchronization as defined in 17.3.9.10.

***TGax Editor: add the following subclause at the end of 17.3.9: (2115):***

17.3.9.10 Pre-correction Accuracy Requirements

A STA that transmit a PPDU whose TRIGGER\_RESPONDING in TXVECTOR is 1 shall pre-compensate for carrier frequency offset (CFO) error and symbol clock error. After compensation, the absolute value of residual CFO error with respect to the PPDU carrying the associated MU-RTS frame shall not exceed 2 kHz when measured as the 10% point of CCDF of CFO errors in AWGN at a received power of -60 dBm in the primary 20MHz. The residual CFO error measurement shall be made on the non-HT PPDU or non-HT duplicate PPDU following the L-STF field. The symbol clock error shall be pre-compensated by the same ppm amount as CFO error.

A STA that transmits an non-HT or non-HT duplicate PPDU whose TRIGGER\_RESPONDING in TXVECTOR is 1 shall have timing accuracy of ±0.4 µs relative to the PPDU carrying the MU-RTS frame. This requirement does not include round trip delay. This requirement is the same as the timing requirement for HE triggerbased PPDU.