IEEE P802.11
Wireless LANs

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| IEEE 802.11 TGax, MU Ad hocNovember 2015 Dallas TGax MU Ad hoc Meeting Minutes |
| Date: 2015-11-10 |
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Abstract

The meeting minutes from the MU Ad Hoc group meeting of TGax in the IEEE 802.11 Dallas session, November 9th – 12th, 2015.

**IEEE 802.11 Task Group ax, MU Ad hoc**

**November 2015 Bangkok Meeting**

**November 9th – 12th, 2015**

**MU Adhoc Session #1**

**Tuesday, November 10th, 2015, PM1 TGax Session (1:30 – 3:30PM)**

1. **The meeting called to order by Kaushik Josiam (Samsung), the co-chair of the TGax MU Ad hoc**
	1. At 2:25 pm, 116 people are present.
2. **Announcement**
	1. Agenda Doc.11-15/xxx on the server. Rev. 0 is the working document.
	2. Meeting Protocol: The Chair asked to state name and affiliation when speaking for the first time.
	3. Attendance reminder.
		1. The attendance server: https://imat.ieee.org/
3. **The chair reviewed the mandatory 5 slides of P&P.**
	1. Instructions from the WG Chair. [reviewed~~, did not review~~]
	2. Participants, Patents, and Duty to Inform. [reviewed~~, did not review~~]
	3. Patent Related Links. [reviewed, ~~did not review~~]
	4. Call for potentially essential patents.
		1. Chair asked if anyone is aware of potentially essential patents

 [Asked. ~~Did not ask~~]

* + 1. Potentially essential patents

 [None reported. ~~Reported as follows~~]

* 1. Other Guidelines for IEEE WG Meetings.
1. **The Chair identified 12 presentations assigned by the TGax chair to be treated in MU Ad hoc**
	1. No new presentations, other than those listed in the agenda, were requested.

1. **The Chair asked for approval of the agenda**
	1. No objection raised
2. **Presentation of contributions**
	1. 1280 Traffic priority for random Multi User Uplink OFDMA
		1. Strawpoll #1 (pre-motion): *The spec shall define a procedure for the data selection upon random trigger frame reception, respectful of AC priorities:*

Y/N/A: 5/2/many

SP fails

* + 1. Strawpoll #2 (pre-motion):
		*The spec shall define a Collision Risk Factor (CRF) reflecting the probability of transmission error to be taken into account in the CWO computation according to the formula: CWO = CWOmin x 2CRF*

*The CRF can be provided by the AP (optional Randomization Parameter [4]) or computed locally by each STA based on its previous MU UL transmission status.*

*Randomization Parameter received from AP is priority compared to locally computed CRF value.*

Y/N/A: 5/7/many

SP fails

* + 1. Strawpoll #3 (pre-motion):

*A STA shall compute the CWOmin and CWOmax values upon TF-R reception. The CWOmin value shall be adapted according to the number of RU (NbRu) defined by the received TF-R, and the CWOmax shall be adapted (AC\_Priority\_Factor[] is TBD) according to the current highest priority (CurrentAC) of the data contained in AC queues.*

*The resulting formulas for the CWOmin and CWOmax shall be:*

 *CWOmin=NbRu*

 *CWOmax=fct (AC\_Priority\_Factor[Current AC] )*

Y/N/A: 2/5/many

SP fails

* + 1. Strawpoll #4 (pre-motion):
		*The STA shall compute the OBO from CWO + an offset based on data AC according to the formula :*

 *OBO=rand[0,CWO]+AC\_Offset[Current\_AC](TBD)*

Y/N/A: 3/5/many

SP fails

* 1. 1301 NAV Rule for UL MU Response
		1. Strawpoll #1 (pre-motion): **Do you agree to add the following underlining part to the TGax SFD:**
		4.3 UL MU operation

A STA that is polled from a Trigger frame for UL MU transmission considers the NAV in determining whether to respond unless one of the following conditions is met

- The NAV was set by a frame originating from the AP sending the trigger frame

- The response contains ACK/BA and the duration of the UL MU transmission is below a TBD threshold

- The NAV was set by a frame originating from intra-BSS STAs

- Other condition TBD

Y/N/A: 35/0/28

SP passes

* 1. 1328 Scheduling information for UL OFDMA Acknowledgement
		1. Strawpoll #1 (pre-motion):

Scheduling information for UL OFDMA Acknowledgement from STA may be contained within the “HE variant of the HT Control Field”

Y/N/A: 19/0/26

SP passes

* + 1. Strawpoll #2 (pre-motion):

HE variant of HT control field that contains scheduling information for UL MU Acknowledgement from STAs shall also include

* + number of LTF symbols, NLTF,
	+ and PHY padding and packet extension signaling, PE

for UL MU transmission. The signaling format of the scheduling information for UL MU Acknowledgement is defined as



Y/N/A: 9/23/25

SP fails

* 1. 1314 I/Q Imbalance Impact to TGax OFDMA Uplink Reception

SPs deferred to TGax session

1. The Chair announced the end of the MU ad hoc session at 3:30 pm.

**MU Adhoc Session #2**

**Wednesday, November 11th, 2015, PM2 TGax Session (4:00 – 6:00PM)**

1. **The meeting called to order by Sigurd Schelstraete (Quantenna), the co-chair of the TGax MU Ad hoc**
	1. At 5 pm, 81 people are present.
2. **Announcement**
	1. Agenda Doc.11-15/1418r1 on the server. Rev. 1 is the working document.
	2. Meeting Protocol: The Chair asked to state name and affiliation when speaking for the first time.
	3. Attendance reminder.
		1. The attendance server: https://imat.ieee.org/
3. **The chair reviewed the mandatory 5 slides of P&P.**
	1. Instructions from the WG Chair. [reviewed~~, did not review~~]
	2. Participants, Patents, and Duty to Inform. [reviewed~~, did not review~~]
	3. Patent Related Links. [reviewed, ~~did not review~~]
	4. Call for potentially essential patents.
		1. Chair asked if anyone is aware of potentially essential patents

 [Asked. ~~Did not ask~~]

* + 1. Potentially essential patents

 [None reported. ~~Reported as follows~~]

* 1. Other Guidelines for IEEE WG Meetings.
1. **The Chair identified 8 remaining presentations assigned by the TGax chair to be treated in MU Ad hoc**
	1. No new presentations, other than those listed in the agenda, were requested.

1. **The Chair asked for approval of the agenda**
	1. No objection raised
2. **Presentation of contributions**
	1. 1312 MU BAR Frame Format
		1. Do you agree the following to be added to 11ax SFD:

		7.2.X: The MU BAR frame is a Trigger frame with type BAR that carries additional BAR Control subfield in the common info and an additional BAR Information subfield in each per-STA info.

		Y/N/A: 22/2/22
		Strawpoll passes
	2. 1374 Consideration for protecting cascading MU DL/UL transmission with MU RTS/CTS
		1. Do you agree to add to the TG Specification Frame work document?

		*The spec shall include a mechanism that allows MU RTS/CTS to protect both MU Downlink and MU Uplink transmission(s) within the same TXOPs.*Strawpoll withdrawn – to be combined with SP in 1325

* 1. 1325 MU-RTS/CTS Follow Up
		1. SP#1: Do you agree to add to the TG Specification Frame work document?

		*x.y.z. MU-RTS/CTS frame exchange may be used for protection of MU transmissions during that TXOP*Y/N/A: 47/0/7
		Strawpoll passes
		2. SP#2: Do you agree to add to the TG Specification Frame work document?

		*x.y.z. The MAC format of MU-RTS is a variant of trigger frame format*Y/N/A:48/0/8
		Strawpoll passes
		3. SP#3: Do you agree to add to the TG Specification Frame work document?

		*x.y.z. The CTS sent in response to a frame that solicits simultaneous CTS shall be transmitted on one or more 20 MHz channels.*

Y/N/A:44/0/9
Strawpoll passes

* + 1. SP#4: Do you agree to add to the TG Specification Frame work document?

		*x.y.z. MU-RTS may request STAs to send non-HT CTS immediate response.*Y/N/A:39/0/7
		Strawpoll passes
		2. SP#5: Do you agree to add to the TG Specification Frame work document?

		*x.y.z. MU-RTS will carry signaling for each STA to indicate the 20MHz channel(s) for transmitting CTS responses when CTS is sent in (duplicate) non-HT PPDU*

*- When a STA sends CTS in response to MU-RTS, the CTS response shall be transmitted in the 20MHz channel(s) indicated in MU-RTS
- provided other transmission conditions TBD are met (e.g. channel idleness)
- The indicated 20 MHz channel(s) can be either Primary20, Primary40, Primary80 or 160/80+80 MHz. Other indications are TBD.
- Exact Signaling TBD*

Y/N/A:40/3/12
Strawpoll passes

* 1. 1326 NAV Consideration for UL MU Response Follow Up
		1. SP#5: Do you agree to add to the TG Specification Frame work document?

		x.y.z. A STA maintains two NAVs

- One is the NAV for Intra-BSS frame, and another one is the NAV for Inter-BSS frame or frame that cannot be determined to be Intra-BSS or Inter-BSS

- Note that maintaining two NAVs does not imply maintaining two NAV timers

- The detailed method of maintaining two NAVs (e.g., two NAV timers or one NAV timer with difference of two NAV values, etc.) is TBD

- Mandatory or Optional TBD

Y/N/A:30/0/14
Strawpoll passes

* 1. 1340 NDP Announcement for HE Sequence
		1. SP#1 Do you agree to add a sequence similar to the VHT sounding sequence that does not include a trigger frame and where the sounding feedback frames are sent in SU PPDUs for HE DL sounding sequence?

		

Y/N/A:8/3/33
Strawpoll fails

* + 1. SP#2 Do you agree to amend the following text in the SFD as follows?:

4.6. Lines 47-49

**

Y/N/A:7/1/Many
Strawpoll passes

* + 1. SP#3

Withdrawn

* 1. 1364 Signaling Trigger Information for STAs in 802.11ax
		1. Within an A-MPDU the trigger information for a STA, if present, shall be signaled either in Trigger frame(s) or in the MAC header of MPDU(s) contained in the A-MPDU but not both.

		Y/N/A:28/0/14
		Strawpoll passes
1. The Chair announced the end of the MU ad hoc session at 5:57 pm.