

**IEEE P802.11  
Wireless LANs**

|  |                    |   |                 |                                  |
|--|--------------------|---|-----------------|----------------------------------|
| <b>IEEE 802.11 TGax</b>                          |                    |   |                 |                                  |
| <b>November 2016 San Antonio Meeting Minutes</b> |                    |   |                 |                                  |
| <b>Date:</b> 2016-11-29                          |                    |   |                 |                                  |
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|  |                    |   |                 |                                  |

**Abstract**

TGax meeting minutes from the IEEE 802.11 November 2016 San Antonio meeting, November 7<sup>th</sup> – 11<sup>th</sup>, 2016.

Minutes/motions from the ad hoc groups are contained in the following documents:

- PHY Ad Hoc
  - Agenda: 11-16-1475, TGax PHY Ad Hoc Nov 2016 Meeting Agenda
  - Minutes: 11-16-1530, November 2016 San Antonio PHY Ad Hoc Meeting Minutes
- MAC Ad Hoc
  - Agenda: 11-16-1478, TGax MAC Ad Hoc November 2016 Meeting Agenda
  - Minutes: 11-16-1480, November 2016 San Antonio TGax MAC Ad hoc Meeting Minutes
- MU Ad Hoc
  - Agenda: 11-16-1487, TGax MU Ad-hoc Agenda November 2016
  - Minutes: 11-16-1520, IEEE 802.11 TGax, MU Ad hoc November 2016 Meeting Minutes
- SR Ad Hoc
  - Agenda: 11-16-1481, TGax Spatial Reuse Ad-hoc Agenda November 2016 Meeting
  - Minutes: 11-16-1569, TGax Spatial Reuse ad hoc group meeting minutes – San Antonio, November 2016

**IEEE 802.11 Task Group AX (TGax)  
November 2016 San Antonio Meeting  
Grand Hyatt San Antonio, TX, U.S.A.  
November 7<sup>th</sup> – 11<sup>th</sup>, 2016**

|                              |   |
|------------------------------|---|
| <b>TGax Chair</b>            | <b>Osama Aboul-Magd (Huawei Technologies)</b> |
| <b>Vice Chair</b>            | <b>Simone Merlin (Qualcomm)</b>               |
| <b>Vice Chair</b>            | <b>Ron Porat (Broadcom)</b>                   |
| <b>TGax Secretary</b>        | <b>Yasuhiko Inoue (NTT)</b>                   |
| <b>TGax Technical Editor</b> | <b>Robert Stacy (Intel)</b>                   |

**Monday, November 7<sup>th</sup>, 2016, AM1 TGax Ad Hoc Session (8:00 - 10:00 AM)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @08:03 AM
  - 1.1. Introduction of TGax chair, secretary, vice chair.
  
2. **Announcement**
  - 2.1. Agenda Doc.11-16/1310r0 on the server. Rev. 1 is the working document.
  - 2.2. Meeting Protocol:
    - 2.2.1. Chair asked to set the mobile devices mute.
    - 2.2.2. Chair asked to state name and affiliation when speaking for the first time.
  - 2.3. Attendance reminder.
    - 2.3.1. The attendance server: <https://imat.ieee.org/>
  - 2.4. Since this is an ad hoc meeting, no motion will be conducted.
  
3. **Agenda Setting.**
  - 3.1. Proposed Agenda for Monday AM1:
    - 3.1.1. Call meeting to order
    - 3.1.2. Ad Hoc Meeting (no Motions)
    - 3.1.3. Patent policy, etc.
    - 3.1.4. Agenda Items for the week.
    - 3.1.5. Call for submissions.
    - 3.1.6. Set Ad hoc Group schedule and approve agenda.
    - 3.1.7. Comment Resolution Status – Robert Stacy (TGax editor).
    - 3.1.8. Timeline
    - 3.1.9. Presentations and Comment Resolution
      - 3.1.9.1. 11-16/1348 Coexistence assurance document
      - 3.1.9.2. 11-16/1363 11ax PAR Verification through OFDMA
      - 3.1.9.3. 11-16/1414 Verifying 11ax<sub>i</sub>'s PAR by UL MU-MIMO
      - 3.1.9.4. 11-16/1435 PAR Verification Simulation Followup
      - 3.1.9.5. More presentations if time allows
    - 3.1.10. Recess.
  - 3.2. Chair asked if there are any other items – No items proposed. Meeting will be conducted based on this order.
  
4. **The chair reviewed the mandatory 5 slides of P&P.**
  - 4.1. Instructions for the WG Chair.
  - 4.2. Participants, Patents, and Duty to Inform.

- 4.3. Patent Related Links.
- 4.4. Call for potentially essential patents.
  - 4.4.1. Chair asked if anyone is aware of potentially essential patents.
  - 4.4.2. No potentially essential patents reported.
- 4.5. Other Guidelines for IEEE WG Meetings.

## 5. Agenda items for the week

- Approve TG and Teleconferences minutes since September meeting.
- Complete the resolution of comments received on draft D0.1
- Approve a motion to prepare draft D1.0 and start WG LB
- Ad Hoc group meetings
- Technical Presentations and related straw polls and/or motions
- Schedule Teleconference times.

## 6. General Flow of the meeting

- 6.1. Slides 13 and 14 of the 16/1310r1 contain general flow of the meeting.
- 6.2. There are eight meeting slots planed for TGax.

|            | Monday                |                  | Tuesday          |                  | Wednesday        |                  | Thursday         |                  |
|------------|-----------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| <b>AM1</b> | TGax<br>(full ad hoc) |                  |                  |                  | TGax<br>(full)   |                  | TGax<br>(ad hoc) | TGax<br>(ad hoc) |
| <b>AM2</b> |                       |                  | TGax<br>(Ad Hoc) | TGax<br>(Ad Hoc) |                  |                  |                  |                  |
| <b>PM1</b> | TGax<br>(full)        |                  |                  |                  | TGax<br>(Ad Hoc) | TGax<br>(Ad Hoc) | TGax<br>(full)   |                  |
| <b>PM2</b> | TGax<br>(ad hoc)      | TGax<br>(ad hoc) | TGax<br>(Ad Hoc) | TGax<br>(Ad Hoc) | TGax<br>(ad hoc) | TGax<br>(ad hoc) | TGax<br>(full)   |                  |
| <b>PM3</b> | TGax<br>(ad hoc)      | TGax<br>(ad hoc) |                  |                  |                  |                  |                  |                  |

## 7. Call for submissions – there are about 90 submissions

### 7.1. PHY – 29 submissions

- 7.1.1. 16/1295, “CC23 PHY CR Miscellaneous Part-1,” Yongho Seok (Newracom)
- 7.1.2. 16/1340, “CR HE-PHY Miscellaneous Part-3,” Lochan Verma (Qualcomm)
- 7.1.3. 16/1341, “CR HE-PHY-Introduction-Part-2,” Lochan Verma (Qualcomm)
- 7.1.4. 16/1356, “Spec text for HE NDP,” Yongho Seok (Newracom)
- 7.1.5. 16/1370, “Proposed Spec Text for CCA Section,” Laurent Cariou (Intel)
- 7.1.6. 16/1371, “CR HE-SIG-B part III,” Ross Jian Yu (Huawei)
- 7.1.7. 16/1372, “Some proposed changes to D0.5,” Ross Jian Yu (Huawei)
- 7.1.8. 16/1374, “Resolution on CID495 and Removal of Unnecessary PHY TBDs,” Yujin Noh (Newracom)
- 7.1.9. 16/1375, “Comment Resolution for CID2867 and Text Change Proposal of 26.3.10.8 HE-SIG-B,” Yujin Noh (Newracom)
- 7.1.10. 16/1377, “Comment resolution on Clauses 26.3.9 and 26.3.10,” Yusuke Asai (NTT)
- 7.1.11. 16/1387, “Comment resolution on CID2506 and proposed changes,” Jinsoo Chio (LG Electronics)
- 7.1.12. 16/1393, “EVM Definition for UL OFDMA,” Ron Porat (Broadcom)
- 7.1.13. 16/1398, “CR for CID 2077,” Sriram Venkateswaran (Broadcom)
- 7.1.14. 16/1399, “Changes to D0.5,” Sriram Venkateswaran (Broadcom)
- 7.1.15. 16/1402, “11ax Receiver Specification,” Bin Tian (Qualcomm)
- 7.1.16. 16/1406, “Spec Text for 11ax Receiver Requirements,” Bin Tian (Qualcomm)

- 7.1.17. 16/1407, "Changes to D0.5," Xiaogang Chen (Intel)
- 7.1.18. 16/1408, "PHY CRs 26.3.3,26.3.18,26.3.19," Xiaogang Chen (Intel)
- 7.1.19. 16/1410, "Clause 26 Fixes," Hongyuan Zhang (Marvell)
- 7.1.20. 16/1411, "TXTIME and RXTIME Fixes," Hongyuan Zhang (Marvell)
- 7.1.21. 16/1421, "Smoothness Recommendation for 4x HE-LTF," Feng Jiang (Intel)
- 7.1.22. 16/1427, "Remove TBDs in PHY Transmit Spec.," Yujin Noh (Newracom)
- 7.1.23. 16/1434, "Miscellaneous HE PHY corrections," Lochan Verma (Qualcomm)
- 7.1.24. 16/1437, "Updated Text for DCM," Jianhan Liu (MediaTek)
- 7.1.25. 16/1438, "0.8us GI with 4x HE LTF," Jianhan Liu (MediaTek)
- 7.1.26. 16/1439, "Error correction to D0.5 on Beam-change text," Jianhan Liu (MediaTek)
- 7.1.27. 16/1443, "Spec text: Smoothness Recommendation for HE-LTF," Feng Jiang (Intel)
- 7.1.28. 16/1448, "Remaining CR on section-26-2-2 TXRXVECTOR Parameters," Ke Yao (ZTE)
- 7.1.29. 16/1449, "Proposed Text Changes to TXRXVECTOR in Clause 26.2.2," Ke Yao (ZTE)

## 7.2. MAC – 36 submissions

- 7.2.1. 16/1238, "Setting Quiet time period – text," Chao-Chun Wang (MediaTek)
- 7.2.2. 16/1352, "CC23 MAC CR Miscellaneous Part-1," Yongho Seok (Newracom)
- 7.2.3. 16/1354, "CC23 CR Annex C," Yongho Seok (Newracom)
- 7.2.4. 16/1355, "Spec text for 10.22.2.5 and 3.2," Yongho Seok (Newracom)
- 7.2.5. 16/1358, "CC0-Remaining CIDs on BA," Alfred Asterjadhi (Qualcomm)
- 7.2.6. 16/1359, "CC0-Some remaining CIDs related to TWT," Alfred Asterjadhi (Qualcomm)
- 7.2.7. 16/1360, "CC0-HE variant HT control - Some Remaining CIDs," Alfred Asterjadhi (Qualcomm)
- 7.2.8. 16/1362, "CC0-Complete RTS Enablement," Alfred Asterjadhi (Qualcomm)
- 7.2.9. 16/1367, "NDP feedback report," Laurent Cariou (Intel)
- 7.2.10. 16/1368, "Follow-up on MU EDCA parameters," Laurent Cariou (Intel)
- 7.2.11. 16/1380, "Proposed text changes for TWT in congested environment," Laurent Cariou (Intel)
- 7.2.12. 16/1381, "Proposed text changes for fragmentation operation," Laurent Cariou (Intel)
- 7.2.13. 16/1404, "Early TWT SP Termination in TWT Operation," Jayh Hyunhee Park (LG Electronics)
- 7.2.14. 16/1409, "A-MSDU Fragmentation," Matthew Fischer (Broadcom)
- 7.2.15. 16/1413, "CID193 BSS Color Disabled Indication," Abhishek Patil (Qualcomm)
- 7.2.16. 16/1415, "CID72 BSS Color change mechanism," Abhishek Patil (Qualcomm)
- 7.2.17. 16/1416, "CC0-HE BSS operation11-16-xxxx-00-00ax-CC0-HE BSS operation," Alfred Asterjadhi (Qualcomm)
- 7.2.18. 16/1417, "CC0-HE BSS operation," Alfred Asterjadhi (Qualcomm)
- 7.2.19. 16/1418, "CC0-HE Multirate Support and 2G4 40MHz HE STA," Alfred Asterjadhi (Qualcomm)
- 7.2.20. 16/1419, "MCS\_NSS\_BW\_PPDU\_Selection\_for\_11ax," Alfred Asterjadhi (Qualcomm)
- 7.2.21. 16/1420, "TWT Information frames in 11ax," Alfred Asterjadhi (Qualcomm)
- 7.2.22. 16/1423, "NAV Update Rule Considering UL MU Operation," Geonjung Ko (WILUS)
- 7.2.23. 16/1424, "Issue on the CWmax value in MU EDCA," Woojin Ahn (WILUS)
- 7.2.24. 16/1425, "Clarification on applying MU EDCA parameter set," Woojin Ahn (WILUS)
- 7.2.25. 16/1431, "IEEE 802.11ax Annex G," Osama Aboul-Magd (Huawei Technologies)
- 7.2.26. 16/1442, "Spec texts for section 25.4 BA," Jeongki Kim (LG Electronics)
- 7.2.27. 16/1452, "Multiple BSSID and MU," Liwen Chu (Marvell)
- 7.2.28. 16/1453, "A-MPDU content," Liwen Chu (Marvell)
- 7.2.29. 16/1454, "Multiple BSSID and MU Discussion," Liwen Chu (Marvell)
- 7.2.30. 16/1456, "A-MPDU content discussion," Liwen Chu (Marvell)
- 7.2.31. 16/1458, "Comment Resolution for Sub-clause 25.13.2," Chittabrata Ghosh (Intel)
- 7.2.32. 16/1459, "Considerations on Quiet Time Period," Jinsoo Ahn (Yonsei Univ.)
- 7.2.33. 16/1461, "MU BAR comment resolutions," Reza Hedayat (Newracom)
- 7.2.34. 16/1464, "RD Protocol," Jarkko Knecht (Apple)
- 7.2.35. 16/1468, "A-MPDU Content Capabilities," Raja Banerjee (Qualcomm)
- 7.2.36. 16/1477, "CC23 Proposed Resolution (Update for) TWT Element," Matthew Fischer (Broadcom)

## 7.3. SR – 9 submissions

- 7.3.1. 16/0947, “Proposed text changes for OBSS\_PD-based SR parameters,” Matthew Fischer (Broadcom)
- 7.3.2. 16/1063, “Unified SR text DSC, ATPC, inter-BSS,” Graham Smith (SR Technologies)
- 7.3.3. 16/1064, “Unified SR approach DSC, ATPC and Inter-BSS,” Graham Smith (SR Technologies)
- 7.3.4. 16/1121, “Spec Texts: Spatial Reuse Indication for Trigger,” Po-Kai Huang (Intel)
- 7.3.5. 16/1337, “CR on SR CCA rules clause 25.9,” Bo Sum (ZTE)
- 7.3.6. 16/1403, “SR Backoff Procedure,” Jayh Hyunhee Park (LG Electronics)
- 7.3.7. 16/1430, “Comment Resolution for SR on BSS Color,” Junichi Iwatani (NTT)
- 7.3.8. 16/1440, “Proposed Resolutions to CID 2719,” Jing Ma (NICT)
- 7.3.9. 16/1450, “CR for CID 2492 section 25.9 spatial reuse operation,” Kaiying Lv (ZTE)

## 7.4. MU – 12 submissions

- 7.4.1. 16/1353, “CC23 MAC CR Miscellaneous Part-2,” Yongho Seok (Newracom)
- 7.4.2. 16/1357, “CC0 Remaining CIDs on sounding,” Alfred Asterjadhi (Qualcomm)
- 7.4.3. 16/1361, “CC0- Remaining CIDs on MU Operation,” Alfred Asterjadhi (Qualcomm)
- 7.4.4. 16/1382, “MAC support of preamble puncture,” Zhou Lan (Broadcom)
- 7.4.5. 16/1383, “Spec Text: MAC support of preamble puncture,” Zhou Lan (Broadcom)
- 7.4.6. 16/1389, “Comment Resolution for CID 807,” Po-Kai Huang (Intel)
- 7.4.7. 16/1390, “Spec Text: Revision for NAV Setting Rule under Immediate Response,” Po-Kai Huang (Intel)
- 7.4.8. 16/1391, “Comment Resolution Random Access miscellaneous,” Young Hoon Kwon (Newracom)
- 7.4.9. 16/1392, “Comment Resolution CID 2624 and 2738,” Young Hoon Kwon (Newracom)
- 7.4.10. 16/1426, “DL/UL indication in MU-RTS,” Woojin Ahn (WILUS)
- 7.4.11. 16/1441, “Consideration on Internal Contention Between Data and Trigger Frame,” Jing Ma (NICT)
- 7.4.12. 16/1457, “11ax D0.1 Comment Resolution for Clause 25.5.3,” David Xun Yang (Huawei)

## 7.5. TG – 4 submissions

- 7.5.1. 16/0995, “Editor's report,” Robert Stacy (Intel)
- 7.5.2. 16/1363, “11ax PAR Verification through OFDMA,” Suhwook Kim (LG Electronics)
- 7.5.3. 16/1414, “Verifying 11ax’s PAR by UL MU-MIMO,” Jason Yuchen Guo (Huawei)
- 7.5.4. 16/1435, “PAR Verification Simulation Followup,” James Yee (MediaTek)

**8. Ad Hoc meeting scheduling**

## 8.1. Ad Hoc slot assignment

- 8.1.1. PHY ... 5, MAC ... 5, SR ... 2, MU ... 2.

|            | Monday                |               | Tuesday       |               | Wednesday      |               | Thursday       |               |
|------------|-----------------------|---------------|---------------|---------------|----------------|---------------|----------------|---------------|
| <b>AM1</b> | TGax<br>(full ad hoc) |               |               |               | TGax<br>(full) |               | TGax<br>(PHY)  | TGax<br>(MAC) |
| <b>AM2</b> |                       |               | TGax<br>(PHY) | TGax<br>(MAC) |                |               |                |               |
| <b>PM1</b> | TGax<br>(full)        |               |               |               | TGax<br>(PHY)  | TGax<br>(MAC) | TGax<br>(full) |               |
| <b>PM2</b> | TGax<br>(PHY)         | TGax<br>(MAC) | TGax<br>(SR)  | TGax<br>(MU)  | TGax<br>(PHY)  | TGax<br>(MAC) | TGax<br>(full) |               |
| <b>PM3</b> | TGax<br>(SR)          | TGax<br>(MU)  |               |               |                |               |                |               |

## 8.2. Chair asked if there are any objections to approve the TGax schedule as follow.

- 8.2.1. There are no objections. The TGax schedule is approved.

## 9. Presentations

**9.1. Osama Aboul-Magd (Huawei Technologies), Chair of TGax, presented “Coexistence assurance document,” based on the submission 11-16/1348r1, on behalf of Eldad Perahia (HP Enterprise).**

## 9.1.1. Summary

9.1.1.1. Eldad Perahia (HP Enterprise) created the coexistence assurance document and the initial version was presented during the TGax teleconference.

9.1.1.2. The TGax chair presented the updated document.

## 9.1.2. Discussion

9.1.2.1. During the teleconference, some issues have been raised such as the definition of “legacy 802.11 system,” and content of the section 5 New Features.

9.1.2.2. Osama asked for suggestions for the above issues.

## 9.1.3. Next Step

9.1.3.1. Osama will make some modification before the motion to approve the document as the official TGax CA document.

**9.2. Suhwook Kim (LG Electronics) presented “11ax PAR Verification through OFDMA,” based on the submission 11-16/1363r0.**

## 9.2.1. Summary

9.2.1.1. It was verified that OFDMA can provide four times throughput enhancement in outdoor environment and DL/UL mixed traffic.

9.2.1.2. More gain in OFDMA can be obtained e.g., by adopting a better scheduler than a random scheduler.

## 9.2.2. Discussion

9.2.2.1. A member asked for the details of simulation conditions such as frame aggregation and MCS selection. Another member also asked for the simulation set up.

9.2.2.2. Chair asked for the importance of the simulation scenario that 37 STAs are on the same location. The answer is that it is to obtain the highest performance gain.

## 9.2.3. Next Step

9.2.3.1. The presenter plans to provide more simulation results.

**9.3. Jason Yuchen Guo presented “Verifying 11ax’s PAR by UL MU-MIMO,” based on the submission 11-16/1414r2.**

## 9.3.1. Summary

9.3.1.1. This presentation is to verify the four times throughput gain by UL MU-MIMO.

9.3.1.2. Higher throughput gain can be expected as the STA density goes higher.

9.3.1.3. Use of efficient scheduling algorithm also important for the higher throughput gain.

## 9.3.2. Discussion

9.3.2.1. There was a discussion on the fairness of the scheduling algorithm.

9.3.2.2. A member asked for the reason of fixed throughput performance in slide 4. → It is due to the assumed scheduling algorithm.

9.3.2.3. There was a discussion on the MCS selection/link adaptation.

9.3.2.4. There was a question on the use of buffer status report. → It is not considered in the simulations.

**9.4. James Yee (MediaTek) presented “PAR Verification Simulation Follow-up ,” based on the submission 11-16/1435r0.**

## 9.4.1. Summary

9.4.1.1. In the residential scenario, increasing STA size improves DL gain and using higher UL MCS (5->8, 9) improves UL gain.

9.4.1.2. Indoor BSS scenario with more STAs and no frequency reuse does not show additional performance gain.

9.4.1.3. 4x gain with certain single BSS scenarios, but they are not the 'dense' STA and BSS scenarios we target in the EVM.

#### 9.4.2. Discussion

9.4.2.1. A member commented on the throughput of MU with and without OBSS\_PD that overhead introduced by the trigger frame is not so significant.

9.4.2.2. There was a discussion on the adjustment of OBSS\_PD in a multiple BSS scenario.

9.4.2.3. A member asked if there are simulation results changing the packet size. The answer is yes. Additional gain can be expected in some cases.

9.4.2.4. There was a discussion on the impact of legacy STAs.

#### 9.4.3. Straw poll

9.4.3.1. The straw poll was deferred until PM1 (due to lack of time).

### 10. Adjournment

10.1. TGax ad hoc session adjourned @ 10:00 AM.

**Monday, November 7<sup>th</sup>, 2016, PM1 TGax Ad Hoc Session (13:30 - 15:30)**

1. **The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @13:33 AM**
  - 1.1. Introduction of TGax chair, secretary, vice chair.
  
2. **Announcement**
  - 2.1. Agenda Doc.11-16/1310r1 on the server. Rev. 2 is the working document.
  - 2.2. Meeting Protocol: Chair asked to state name and affiliation when speaking for the first time.
  - 2.3. Attendance reminder.
    - 2.3.1. The attendance server: <https://imat.ieee.org/>
  
3. **Agenda for Monday, November 7<sup>th</sup>, PM1 (13:30 – 15:30).**
  - 3.1. Proposed Agenda for Monday PM1:
    - 3.1.1. Call meeting to order
    - 3.1.2. Patent policy, etc.
    - 3.1.3. Call for submissions.
    - 3.1.4. Set Ad hoc Group schedule and approve agenda.
    - 3.1.5. Summary from September 2016 meeting.
    - 3.1.6. TG motions
      - 3.1.6.1. Approve TG meeting and Telecon minutes since November meeting.
      - 3.1.6.2. Approve resolutions of comments, if needed
    - 3.1.7. Comment Resolution Status – Robert Stacy (TGax editor).
    - 3.1.8. Timeline
    - 3.1.9. Presentations and Comment Resolution
    - 3.1.10. Recess.
  - 3.2. Chair asked if there are any other items – No items proposed. Meeting will be conducted based on this order.
  
4. **The chair reviewed the mandatory 5 slides of P&P.**
  - 4.1. Instructions for the WG Chair.
  - 4.2. Participants, Patents, and Duty to Inform.
  - 4.3. Patent Related Links.
  - 4.4. Call for potentially essential patents.
    - 4.4.1. Chair asked if anyone is aware of potentially essential patents.
    - 4.4.2. No potentially essential patents reported.
  - 4.5. Other Guidelines for IEEE WG Meetings.
  
5. **Agenda items for the week**
  - 5.1. Approve TG and Telecons minutes since July meeting.
  - 5.2. Resolution of comments received on draft D0.1
  - 5.3. Ad Hoc group meetings
  - 5.4. Technical Presentations and related straw polls and/or motions
  - 5.5. Schedule Telecon times.
  
6. **Summary from the September 2016 Meeting – slide 23 of the agenda document.**
  - Continue with the resolution of comments received on CC-23
  - Good progress on the comment resolution
  - Adjusted the TG timeline with draft D1.0 available after November meeting.
  - Draft D0.5 was prepared by the TG Editor.

- Conducted “almost” weekly telecons since September F2F meeting.
  - Covered 13 submissions
  - Discussed resolutions of almost 55 CIDs
  - Please refer to telecon minutes
    - <https://mentor.ieee.org/802.11/dcn/16/11-16-1308-02-00ax-tgax-teleconference-minutes-from-september-to-october.docx>

## 7. TG Motions

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### 7.1. Approve TGax minutes of meetings and teleconferences from September 2016 meeting to today:

- <https://mentor.ieee.org/802.11/dcn/16/11-16-1231-00-00ax-tgax-september-2016-warsaw-meeting-minutes.docx>
- <https://mentor.ieee.org/802.11/dcn/16/11-16-1308-02-00ax-tgax-teleconference-minutes-from-september-to-october.docx>
- <https://mentor.ieee.org/802.11/dcn/16/11-16-1300-00-00ax-september-2016-tgax-spatial-reuse-ad-hoc-group-meeting-minutes.docx>
- <https://mentor.ieee.org/802.11/dcn/16/11-16-1276-00-00ax-september-2016-warsaw-tgax-phy-ad-hoc-meeting-minutes.docx>
- <https://mentor.ieee.org/802.11/dcn/16/11-16-1252-01-00ax-september-2016-warsaw-tgax-mac-ad-hoc-meeting-minutes.docx>
- <https://mentor.ieee.org/802.11/dcn/16/11-16-1275-00-00ax-mu-ad-hoc-meeting-minutes-september-2016.docx>

### 7.2. Moved by Simone Merlin, Seconded by Robert Stacy

### 7.3. Result: Motion was accepted with no objection.

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## 8. Editor’s Report

- 8.1. Robert Stacy (Intel), TGax Editor, presented “,” based on the submission 11-16-0995-02.
- 8.2. CR Status Summary
- 8.3. Discussion – No discussion.

## 9. Timeline

- **Current Timeline**
  - **May 2014: start of the TG**
  - **Nov. 2014: First draft of the TG SFD was approved**
  - **Jan. 2016: proposed TG draft**
  - **March 2016: Draft D0.1 was approved and CC started**
  - **November 2016: Draft 1.0 and WG letter ballot**
  - **May 2017: Draft 2.0 and recirculation**
  - **November 2017: MDR (Mandatory Document Review)**
  - **January 2018: Formation of SB pool**
  - **March 2018: Sponsor Ballot**
  - **December 2018: RevCom**

- 9.1. The good news is that the number of TBDs in the draft is reduced as shown in slide 27.

**10. Presentation and Comment Resolution**

- 10.1. PAR Verification Discussion
  - 10.1.1. Discussion on continuing the work on PAR verification
    - 10.1.1.1. 4 time improvement is already shown for outdoor scenarios in 11-16/1363
    - 10.1.1.2. 4 times for indoor scenario is observed in 11-16/1414
  - 10.1.2. Discussion
    - 10.1.2.1. A member commented that it is hard to show x4 improvement for indoor cases. Outdoor scenario is more appropriate.
    - 10.1.2.2. There was a comment that some simulation results are not based on realistic scenarios. More time is needed to evaluate realistic scenario.
    - 10.1.2.3. There was a comment that indoor scenario is very important.
    - 10.1.2.4. A member suggested mixed environment of HE and legacy STAs.
    - 10.1.2.5. There was a comment that single BSS is not a dense environment.

**10.1.3. Straw poll by James Yee (MediaTek) re: submission 11-16-1435-00.**


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**10.1.3.1. Straw Poll: While we continue to look for additional gain under new modes - combination of 11ax features, do we:**

**Option 1****Continue to use current EVM scenarios.****Option 2**

**Modify scenarios in the EVM. E.g.**  
**- Adding single BSS scenarios**  
**- New OBSS scenarios**

**10.1.3.2. Discussion****10.1.3.2.1. Chair commented that we need more time if we choose option 2.****10.1.3.2.2. A member asked if EVM is the right reference to discuss the simulation scenario.****10.1.3.2.3. Chair asked if there is any objection to go with option 2. → No objection. The simulation scenario will be discussed in the TGax conferences.****10.2. James Wang (MediaTek) presented “Spatial Reuse Subfield Encoding Rule Clarification,” based on the submission 11-16-1473-00.**

- 10.2.1. Summary
  - 10.2.1.1. This is the proposed changes to the Spatial Reuse subfield encoding rule based on TGax Draft 0.5
  - 10.2.1.2. Transmit power of AP in table 26-19 Spatial Reuse subfield encoding is changed from “TX PWRAP: -10 dBm to 26 dBm” to “TX PWRAP:  $\geq$ -10 dBm.”
- 10.2.2. Discussion
  - 10.2.2.1. A member commented it could mean infinite transmit power is allowed. → The upper limit of the transmit power is obviously the regulatory limit.
- 10.2.3. Next Step
  - 10.2.3.1. Chair asked if there is objection to this change. → No objection heard.

**10.3. Sameer Vermani (Qualcomm) presented “Comment Resolutions of Miscellaneous HE PHY comments,” based on the submission 11-16-1340-03.**

- 10.3.1. Summary

- 10.3.1.1. A previous version of this document was presented by Lochan Verma during the TGax conference call on October 27<sup>th</sup> and got some minor comment.
- 10.3.1.2. This is the update considering those comments.
- 10.3.2. Discussion
  - 10.3.2.1. A member suggested further change to the document. → Sameer agreed.
- 10.3.3. Next Step
  - 10.3.3.1. Chair asked if there is any objection to accept the resolution. → No objection heard.
- 10.4. Sameer Vermani (Qualcomm) presented “Comment Resolutions on Clause 26.1.1 Part 2,” based on the submission 11-16-1341-06.**
  - 10.4.1. Summary
    - 10.4.1.1. Previous version of this document was presented by Lochan Verma during the TGax teleconference on October 27<sup>th</sup>.
    - 10.4.1.2. Proposed changes to the text in 26.1.1 Introduction to the HE PHY.
  - 10.4.2. Discussion
    - 10.4.2.1. No discussion.
  - 10.4.3. Next Step
    - 10.4.3.1. Chair asked if there is any objection to the resolution. → No objection heard.
- 10.5. Sameer Vermani (Qualcomm) presented “Miscellaneous HE PHY Corrections,” based on the submission 11-16-1434-01.**
  - 10.5.1. Summary
    - 10.5.1.1. Various fixes relevant to the HE PHY propsoed.
  - 10.5.2. Discussion
    - 10.5.2.1. A member suggested minor correction to the document. Sameer agreed and updated the document.
  - 10.5.3. Next Step
    - 10.5.3.1. Chair asked if there is any objection to this resolution. → No objection heard.
- 10.6. Jarkko Kneckt (Apple) presented “Resolution to CIDs 52, 2459 and 2632,” based on the submission 11-16-1464-00.**
  - 10.6.1. Summary
    - 10.6.1.1. This document contains proposed resolutions for CIDs 52, 2459 and 2632 regarding the reverse direction protocol.
    - 10.6.1.2. Text for the RD protocol signaling and the use of Multi-TID transmissions in RD protocol were proposed.
  - 10.6.2. Discussion
    - 10.6.2.1. A member commented that there is duplicate on the definition of the Multi-TID Aggregation. → Jarkko to update the document.
    - 10.6.2.2. There was a discussion on the tradeoff between the AC constraint and QoS.
  - 10.6.3. Next Step
    - 10.6.3.1. Chair asked if there is any objection to incorporate these changes to the draft. → No objection heard.
- 10.7. Ross Jian Yu (Huawei Technologies) presented “Proposed resolutions to comments on clause 26.3.10.8 in D0.5,” based on the submission 11-16-1371-00.**
  - 10.7.1. Summary
    - 10.7.1.1. The document contains the proposed resolutions for CIDs 308, 1619 and 2847.
    - 10.7.1.2. The document contains the proposed changes to the text in clause 26.3.10.8.4 as well which clarifies the mapping of user-fields to the RU allocation signaling for 80 and 160 MHz.
  - 10.7.2. Discussion
    - 10.7.2.1. No discussion.

## 10.7.3. Next Step

10.7.3.1. Chair asked if there is any objection to the proposed resolutions. → No objection.

**10.8. Ross Jian Yu (Huawei Technologies) presented “Proposed change,” based on the submission 11-16-1372-01.**

## 10.8.1. Summary

10.8.1.1. This submission contains the proposed changes to clause 26.3.10.5 L-SIG and 26.3.10.8 HE-SIG-B.

## 10.8.2. Discussion

10.8.2.1. Chair confirmed that this is not comment resolution.

## 10.8.3. Next Step

10.8.3.1. Chair asked if there is any objection to accept the proposed changes in 16/1372r1.  
→ No objection.

**11. AoB**

11.1. Chair asked if we have any business that can be conducted.

11.2. Room assignment for PM2 & PM3:

11.2.1. PM2: PHY – Texas D, MAC - Texas E.

11.2.2. PM3: MU – Texas D, SR – Texas E.

**12. Adjournment**

12.1. TGax recessed @ 15:29 PM.

**Monday, November 7<sup>th</sup>, 2016, PM2 TGax ad hoc sessions (16:00-18:00)**

Ad Hoc room assignment:

- PHY ad hoc: Texas D
- MAC ad hoc: Texas E

**Monday, November 7<sup>th</sup>, 2016, PM3 TGax ad hoc sessions (19:30-21:30)**

Ad Hoc room assignment:

- SR ad hoc: Texas D
- MU ad hoc: Texas E

**Tuesday, November 8<sup>th</sup>, 2016, AM2 TGax ad hoc sessions (10:30-12:30)**

Ad Hoc room assignment:

- PHY ad hoc: Texas D
- MAC ad hoc: Texas E

**Tuesday, November 8<sup>th</sup>, 2016, PM2 TGax ad hoc sessions (16:00-18:00)**

Ad Hoc room assignment:

- SR ad hoc: Texas D
- MU ad hoc: Texas E

**Wednesday, November 9<sup>th</sup> 2016, AM1 TGax Full Sessions (8:00-10:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @8:04 AM.
  - 1.1. Introduction of the TG leadership.
  - 1.2. Agenda 11-16-1310-02 is on the server.
  
2. Announcements/Reminder
  - 2.1. Chair asked participants to state name and affiliation when speaking for the first time during the session.
  - 2.2. Chair reminded that the meeting is conducted under IEEE 802 and 802.11 P&P.
  - 2.3. Chair reminded attendance.
  
3. Agenda Setting
  - 3.1. Proposed agenda for this session
    - 3.1.1. Call Meeting to order
    - 3.1.2. IEEE 802 and 802.11 IPR Policy and procedure.
    - 3.1.3. Progress Review
    - 3.1.4. Presentations
      - 3.1.4.1. 11-16/1472 New Amendment Style – Robert Stacey
      - 3.1.4.2. 11-16/1431 IEEE 802.11ax Annex G - Osama
      - 3.1.4.3. Presentations from ad hocs
    - 3.1.5. Recess
  - 3.2. Chair asked if there is any objection to proceed with this agenda. → No objection.
  - 3.3. The agenda for Wednesday AM1 was approved.
  
4. Progress from Ad Hoc groups
  - 4.1. MU and SR ad hocs – completed.
  - 4.2. PHY: 7 – 8 presentations left.
  - 4.3. MAC: 16 presentations to go.
  
5. Presentations
  - 5.1. Robert Stacy (Intel) presented “New Amendment Style,” based on the submission 11-16-1472r01.**
    - 5.1.1. Summary
      - 5.1.1.1. The new amendment style is not a radical departure from how we amend the 802.11 specification.
      - 5.1.1.2. It concentrates MAC changes into one clause which helps with a number issues.
      - 5.1.1.3. The requirement inheritance is clear from the structure of the document.
    - 5.1.2. Discussion
      - 5.1.2.1. A member asked if there is a plan to apply this new style to the previous amendment. → Currently there is no plan to do so.
      - 5.1.2.2. Chair mentioned that the issue raised during the conference call was cross reference. Not sure what is the real issue.
  
  - 5.2. Osama Aboul-Magd (Huawei Technologies) presented “IEEE 802.11ax Annex G,” based on the submission 11-16-1431r01.**
    - 5.2.1. Summary
      - 5.2.1.1. This document contains resolutions for CIDs 1430, 1703 and 2503.

5.2.1.2. The initial text for the G.5 HE Sequences is proposed. The plan is to put one example here and add more, or reject current text and start from the scratch after the WG LB.

5.2.2. Discussion

5.2.2.1. A member commented that people should pay more attention to this clause since Annex. G is normative. The only trigger sequence looks quiet incomplete.

5.2.2.2. Another member suggested the trigger sequence to be the placeholder.

**5.3. Jeongki Kim (LG Electronics) presented “Spec text for section 25.4 Block Acknowledgment,” based on the submission 11-16-1442r00.**

5.3.1. Summary

5.3.1.1. This is basically a clarification to the texts in subclause 25.4 Block Acknowledgment in D0.5.

5.3.1.2. In 9.3.1.9.7 Multi-STA BlockAck variant (D0.5), ACK of all MPDUs in an A-MPDU is indicated by Ack Type = 1 and TID subfield = 14 of Multi-STA Block ACK frame. The same concept should also be used in other subclauses (25.4 Block Acknowledgement).

5.3.2. Discussion

5.3.2.1. No discussion.

5.3.3. Next Step

5.3.3.1. Chair asked if there is any objection to accept this spec text. → No objection.

**5.4. Abhishek Patil (Qualcomm) presented “Proposed Resolution for CID 193 (BSS Color Disable Indication),” based on the submission 11-16-1413r06.**

5.4.1. Summary

5.4.1.1. The submission contains a resolution for CID 193.

5.4.1.2. The proposed resolution is to disable BSS Color when AP determines that there is a color collision.

5.4.2. Discussion

5.4.2.1. The document is not on the server. A member asked for more time to review.

**5.5. Alfred Asterjadhi (Qualcomm) presented “HE BSS Operation,” based on the submission 11-16-1417r00.**

5.5.1. Summary

5.5.1.1. This document contains a resolution for the CID 154.

5.5.1.2. Proposed resolution includes expansion of the Basic HE MCS and NSS Set field from 2 to 3 bits to include the new MCSs added in 11ax (1024 QAM) and the addition of the VHT Operation Information field to the HE Operation element to remove dependency from the VHT Operation element.

5.5.2. Discussion

5.5.2.1. No discussion.

5.5.3. Next Step

5.5.3.1. Chair asked if there is any objection to accept this resolution and the changes to the draft. → No objection.

**5.6. Alfred Asterjadhi (Qualcomm) presented “MCS, NSS, BW and PPDU selection for 11ax,” based on the submission 11-16-1419r00.**

5.6.1. Summary

5.6.1.1. This submission contains a proposed clarification on the selection rules for PPDU type, BW, and <MCS, NSS> for 11ax.

5.6.1.2. Proposed to finalize all the normative behavior for the selection of these parameters for control response frames.

- 5.6.1.3. Related submission (11-16-1418) which contains the spec text was presented as well.
- 5.6.2. Discussion
  - 5.6.2.1. There was a discussion on the applicability of each rule.
- 5.6.3. Next Step
  - 5.6.3.1. Chair asked if there is any objection to this resolution for CID #203. → No objection.
- 6. Preview of WG Motion
  - 6.1. Chair showed the motion text for WG Letter Ballot:
    - 6.1.1. Discussion
      - 6.1.1.1. A member mentioned that TGax, at this point, does not need detailed description as in the motion for WG recirculation ballot. Just need to say:
        - 6.1.1.1.1. Instruct the editor to prepare for TGax draft 1.0, and
        - 6.1.1.1.2. Approve a 30-day Working Group Letter Ballot.
      - 6.1.2. Chair will update the motion text as suggested.
    - 6.2. Chair showed the motion text for approval of coexistence assurance document.
- 7. AOB
  - 7.1. Only 5 minutes left.
  - 7.2. No other business to conduct.
- 8. Recess
  - 8.1. TGax full session is in recess @9:55 AM, until Thursday AM2.

**Wednesday, November 9<sup>th</sup> 2016, PM1 TGax Ad Hoc Sessions (13:30-15:30)**

- PHY ad hoc → Texas D.
- MAC ad hoc → Texas E

**Wednesday, November 9<sup>th</sup> 2016, PM2 TGax ad hoc Sessions (16:00-18:00)**

- PHY ad hoc → Texas D
- MAC ad hoc → Texas E

**Thursday, November 10<sup>th</sup>, 2016, AM1 TGax full Session (8:00-10:00)****1 The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chairperson of the TGax, @8:04 AM**

- 1.1 Agenda 16/1310r3 is on the server. Rev. 4 is the working document.
- 1.2 Introduction of people at the front table.

**2 Announcement/Reminder**

- 2.1 Chair reminded IEEE 802 and 802.11 IPR P&P.
- 2.2 Chair asked people to state name and affiliation when addressing for the first time in the session.
- 2.3 Chair reminded people to do attendance.

**3 Agenda for this session**

- 3.1 Thursday AM1, PM1 and PM2
  - 3.1.1 Call Meeting to order
  - 3.1.2 Announcement/Reminder
    - 3.1.2.1 IEEE 802 and 802.11 IPR Policy and procedure.
    - 3.1.2.2 Attendance
  - 3.1.3 Agenda Setting
  - 3.1.4 Presentations
  - 3.1.5 TG Motions
  - 3.1.6 New Business:
    - 3.1.6.1 11-16-1238-04 Setting Quiet Time Period, by Chao-Chun Wang
  - 3.1.7 WG LB, CA Doc Motions
  - 3.1.8 11-16-1537-00, by Guido R. Hiertz.
  - 3.1.9 Goals for January 2017
  - 3.1.10 Teleconference schedule
  - 3.1.11 AOB
  - 3.1.12 Adjourn
- 3.2 Chair asked if there are any modifications to the agenda.
- 3.3 Agenda approved with no objection.

**4 TG Motions**

Chair asked the people to check the agenda file to make sure that the motion text is correct.

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**4.1 PHY Motion****4.1.1 PHY Motion #175: Move to accept the proposed changes to 11ax D0.5 spec text as in 11-16/1356r0.**

**4.1.1.1 Moved by Young Hoon Kwon, Seconded by Alfred Asterjadhi**

**4.1.1.2 Discussion – No discussion.**

**4.1.1.3 Result: The motion was accepted with no objection.**

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**4.1.2 PHY Motion #176: Move to accept the proposed spec changes in doc 11-16/1387r3.**

**4.1.2.1 Moved by Jinsoo Choi, Seconded by Kiseon Ryu.**

**4.1.2.2 Discussion – No discussion.**

**4.1.2.3 Result: The motion was accepted with no objection**

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**4.1.3 PHY Motion #177: Move to accept the proposed spec text changes in doc 11-16/1427r2.**

**4.1.3.1 Moved by Yujin Noh, Seconded by Young Hoon Kwon.**

**4.1.3.2 Discussion – No discussion.**

**4.1.3.3 Result: The motion was accepted with no objection.**

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**4.1.4 PHY Motion #178: Do you agree the proposed spec text changes as in doc 11-16/1370r4.**

**4.1.4.1 Moved by Laurent Cariou, Seconded by Chittabrata Ghosh.**

**4.1.4.2 Discussion – No discussion.**

**4.1.4.3 Result: The motion was accepted with no objection.**

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**4.1.5 PHY Motion #179: Move to accept the proposed spec text changes in doc 11-16/1399r2.**

**4.1.5.1 Moved by Sriram Venkateswaran, Seconded by Ron Porat.**

**4.1.5.2 Discussion – No discussion.**

**4.1.5.3 Result: The motion was accepted with no objection.**

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**4.1.6 PHY Motion #180: Move to adopt the spec text in doc 11/16-1406r1 on 11ax Receiver Requirements.**

**4.1.6.1 Moved by Bin Tian, Seconded by Abhishek Patil.**

**4.1.6.2 Result: The motion was accepted with no objection.**

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**4.1.7 PHY Motion #181: Move to adopt the changes to the 11ax spec text in doc 11/16-1407r4.**

**4.1.7.1 Moved by Xiaogang Chen, Seconded by Chittabrata Ghosh.**

**4.1.7.2 Discussion - No discussion.**

**4.1.7.3 Result: The motion was accepted with no objection.**

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**4.1.8 PHY Motion #182: Move to adopt the spec text in doc 11/16-1443r0 into 11ax draft.**

**4.1.8.1 Moved by Feng Jiang, Seconded by Chittabrata Ghosh.**

**4.1.8.2 Discussion – No discussion.**

**4.1.8.3 Result: The motion was accepted with no objection.**

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**4.1.9 PHY Motion #183: Move to adopt the spec text in doc 11/16-1410r2 into 11ax draft.**

**4.1.9.1 Moved by Hongyuan Zhang, Seconded by Saishankar Nandagopalan.**

**4.1.9.2 Discussion – No discussion.**

**4.1.9.3 Result: The motion was accepted with no objection.**

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**4.1.10 PHY Motion #184: Move to adopt the spec text in doc 11/16-1411r1 into 11ax draft.**

**4.1.10.1 Moved by Hongyuan Zhang, Seconded by Saishankar Nandagopalan.**

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4.1.10.2 Discussion – No discussion.

4.1.10.3 Result: The motion was accepted with no objection.

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4.1.11 PHY Motion #185: Move to adopt the spec text in doc 11/16-1437r0 into 11ax draft.

4.1.11.1 Moved by Tianyu Wu, Seconded by Hongyuan Zhang.

4.1.11.2 Discussion – No discussion.

4.1.11.3 Result: The motion was accepted with no objection.

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4.1.12 PHY Motion #186: Move to adopt the spec text in doc 11/16-1438r4 into 11ax draft.

4.1.12.1 Moved by Tianyu Wu, Seconded by Hongyuan Zhang.

4.1.12.2 Discussion – No discussion.

4.1.12.3 Result: The motion was accepted with no objection.

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4.1.13 PHY Motion #187: Move to adopt the spec text in doc 11/16-1439r1 into 11ax draft.

4.1.13.1 Moved by Tianyu Wu, Seconded by Hongyuan Zhang.

4.1.13.2 Discussion – No discussion.

4.1.13.3 Result: The motion was accepted with no objection.

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4.1.14 PHY Motion #188: Move to adopt the spec text in doc 11/16-1449r3 into 11ax draft.

4.1.14.1 Moved by Bin Tian, Seconded by Alfred Asterjadhi.

4.1.14.2 Discussion – No discussion.

4.1.14.3 Result: The motion was accepted with no objection.

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4.1.15 PHY Motion #189: Move to adopt the spec text in doc 11/16-1434r2 into 11ax draft.

4.1.15.1 Moved by Sameer Vermani, Seconded by Abhishek Patil.

4.1.15.2 Discussion – No discussion.

4.1.15.3 Result: The motion was accepted with no objection.

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4.1.16 PHY Motion #190: Move to adopt the spec text in doc 11-16/1372r1 into 11ax draft.

4.1.16.1 Moved by Ross Jian Yu, Seconded by Ron Porat.

4.1.16.2 Discussion – No discussion.

4.1.16.3 Result: The motion was accepted with no objection.

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## 4.2 MAC Motions

4.2.1 MAC Motion #94: Move to update the 11ax specification D0.5 according to the instructions in document 16/1355r0.

4.2.1.1 Moved by Young Hoon Kwon, Seconded by Eric Wong.

4.2.1.2 Discussion - No discussion.

4.2.1.3 Result: The motion was accepted with no objection.

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**4.2.2 MAC Motion #95: Move to update the 11ax specification D0.5 according to the instructions in document 16/1362r1.**

**4.2.2.1 Moved by Alfred Asterjadhi, Seconded by George Cherian.**

**4.2.2.2 Discussion – No discussion.**

**4.2.2.3 Result: The motion was accepted with no objection.**

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**4.2.3 MAC Motion #96: Move to update the 11ax specification D0.5 according to the instructions in slide 16 of document 16/1367r0.**

**And append the following sentence at the end of slide 16**

**- This mechanism is optional for non-AP STA**

**4.2.3.1 Moved by Laurent Cariou, Seconded by Alfred Asterjadhi.**

**4.2.3.2 Discussion – No discussion.**

**4.2.3.3 Result: The motion was accepted with no objection.**

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**4.2.4 MAC Motion #97: Move to update the 11ax specification D0.5 according to the instructions in document 16/1368r2.**

**4.2.4.1 Moved by Laurent Cariou, Seconded by Eric Wong.**

**4.2.4.2 Discussion – No discussion.**

**4.2.4.3 Result: The motion was accepted with no objection.**

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**4.2.5 MAC Motion #98: Move to update the 11ax specification D0.5 according to the instructions in slide 16 of document 16/1404r1.**

**4.2.5.1 Moved by Kiseon Ryu, Seconded by Alfred Asterjadhi.**

**4.2.5.2 Discussion – No discussion.**

**4.2.5.3 Result: The motion was accepted with no objection.**

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**4.2.6 MAC Motion #99: Move to update the 11ax specification D0.5 according to the instructions in document 16/1409r3.**

**4.2.6.1 Moved by Zhou Lan, Seconded by Eric Wong.**

**4.2.6.2 Discussion – No discussion.**

**4.2.6.3 Result: The motion was accepted with no objection.**

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**4.2.7 MAC Motion #100: Move to update the 11ax specification D0.5 according to the instructions in slides 8, 9 and 10 in document 16/1420r0.**

**4.2.7.1 Moved by Alfred Asterjadhi, Seconded by Abhishek Patil.**

**4.2.7.2 Discussion – No discussion.**

**4.2.7.3 Result: The motion was accepted with no objection.**

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**4.2.8 MAC Motion #101: Move to update the 11ax specification D0.5 according to the instructions in document 16/1380r3.**

- 4.2.8.1 Moved by Laurent Cariou, Seconded by Abhishek Patil.  
4.2.8.2 Discussion – No discussion.  
4.2.8.3 Result: The motion was accepted with no objection.
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4.2.9 MAC Motion #102: Move to update the 11ax specification D0.5 according to the instructions in slide 6 of document 16/1425r2.

- 4.2.9.1 Moved by Woojin Ahn, Seconded by John Son.  
4.2.9.2 Discussion – No discussion.  
4.2.9.3 Result: The motion was accepted with no objection.
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4.2.10 MAC Motion #103: Move to update the 11ax specification D0.5 according to the instructions in document 16/1452r2.

- 4.2.10.1 Moved by Liwen Chu, Seconded by Abhishek Patil.  
4.2.10.2 Discussion – No discussion.  
4.2.10.3 Result: The motion was accepted with no objection.
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4.2.11 MAC Motion #104: Move to update the 11ax specification D0.5 according to the instructions in document 16/1453r1.

- 4.2.11.1 Moved by Liwen Chu, Seconded by Eric Wong.  
4.2.11.2 Discussion – No discussion.  
4.2.11.3 Result: The motion was accepted with no objection.
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4.2.12 MAC Motion #105: Move to update the 11ax specification D0.5 according to the instructions in document 16/1381r2.

- 4.2.12.1 Moved by Laurent Cariou, Seconded by Chittabrata Ghosh.  
4.2.12.2 Discussion – No discussion.  
4.2.12.3 Result: The motion was accepted with no objection.
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4.2.13 MAC Motion #106: Move to instruct the TGax editor to remove the sentence below from IEEE802.11ax D0.5 in clause 9.3.1.23.

“The exact location of each 20 MHz for 80 MHz BW is TBD”

- 4.2.13.1 Moved by Alfred Asterjadhi, Seconded by Ron Porat.  
4.2.13.2 Discussion – No discussion.  
4.2.13.3 Result: The motion was accepted with no objection.
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4.2.14 MAC Motion #107: Move to instruct the TGax Editor to make the following changes (related to HE Link adaptation A-Control format):

- Replace “TBD” with “16” in P17L21 of TGax D0.5
- Replace “TBD” with “Reserved” in P19L8 of TGax D0.5
- Replace “B6+X” with “B15” in P19L6 of TGax D0.5
- Replace “X” with “9” in P19L6 of TGax D0.5

- 4.2.14.1 Moved by Abhishek Patil, Seconded by Alfred Asterjadhi.

4.2.14.2 Discussion – No discussion.

4.2.14.3 Result: The motion was accepted with no objection.

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4.2.15 MAC Motion #108: Move to instruct the TGax Editor to make the changes as shown in 16/1529r0.

4.2.15.1 Moved by Zhou Lan, Seconded by Eric Wong.

4.2.15.2 Discussion – No discussion.

4.2.15.3 Result: The motion was accepted with no objection.

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4.2.16 MAC Motion #109: Move to instruct the TGax Editor to make the changes as shown in slide 6 of document 16/1424r2.

4.2.16.1 Moved by Woojin Ahn, Seconded by John Son.

4.2.16.2 Discussion – No discussion.

4.2.16.3 Result: The motion was accepted with no objection.

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4.2.17 MAC Motion #110: Move to instruct the TGax Editor to make the changes as shown in 16/1442r0.

4.2.17.1 Moved by Jeongki Kim, Seconded by Kiseon Ryu.

4.2.17.2 Discussion – No discussion.

4.2.17.3 Result: The motion was accepted with no objection.

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4.2.18 MAC Motion #111: Move to instruct the TGax Editor to make the changes as shown in 16/1238r4.

4.2.18.1 Moved by Chao-Chun Wang, Seconded by Dengyu Qiao.

4.2.18.2 Discussion – No discussion.

4.2.18.3 Result: The motion was accepted with no objection.

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### 4.3 MU Motions

4.3.1 MU Motion #61: Move to update the 11ax draft specification D0.5 according to editor instruction in document 802.11-16/1383r2

- A HE AP transmits a new trigger variant (Bandwidth Query Report Poll) to solicit bandwidth Query Report from one or multiple HE non AP STAs

- A HE non AP STA after receiving Bandwidth Query Report Poll from a HE AP responds with channel availability information in a new A-control field (Bandwidth Query Report)

- It is optional for a non AP STA to support the Bandwidth Query mechanism

4.3.1.1 Moved by Zhou Lan, Seconded by Ron Porat.

4.3.1.2 Discussion – No discussion.

4.3.1.3 Result: The motion was accepted with no objection.

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4.3.2 MU Motion #62: Move to accept the proposed changes to D0.5 in 802.11-16/1390r0.

4.3.2.1 Moved by Po-Kai Huang, Seconded by Kiseon Ryu.

4.3.2.2 Discussion – No discussion.

**4.3.2.3 Result: The motion was accepted with no objection.**

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#### 4.4 SR Motions

##### 4.4.1 SR Motion #13: Move to incorporate 11-16/947r18 into the TGax draft.

4.4.1.1 Moved by Zhou Lan, Seconded by Ron Porat.

4.4.1.2 Discussion:

- A member commented that this motion should be withdrawn and whole SR related text should be reviewed.
- Another member agreed with the previous commenter and proposed a motion to table this motion.

4.4.1.3 Motion to table SR Motion #13: Move to table the SR Motion #13 till January 2017 F2F meeting.

4.4.1.3.1. Moved by Sean Coffey, Seconded by Graham Smith.

4.4.1.3.2. Result: Y/N/A = 16/42/43, motion to table the SR motion #13 fails.

- Go back to the main motion.
- A member asked for a recorded vote.

**4.4.1.4 Result: Y/N/A = 45/19/51, motion fails (< 75%).**

- The vote record can be found in the Annex of this document.
- 

##### 4.4.2 SR Motion #14: Move to incorporate 11-16/1121r2 into the TGax draft.

4.4.2.1 Moved by Po-Kai Huang, Seconded by Laurent Cariou.

4.4.2.2 Discussion – No discussion.

**4.4.2.3 Result: The motion was accepted with no objection.**

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##### 4.4.3 SR Motion #15: Move to add the following text in the 11ax spec draft (11-16/1403r1).

25.9.2.1 General

- SR Backoff procedure for SR delayed case

The STA may resume its backoff procedure after the end of the PPDU carrying the SR delay entry by following the procedure defined in 10.22.2 HCF contention based channel access (EDCA)

NOTE - The countdown of an existing backoff procedure is suspended until the end of the PPDU carrying the SR delay entry since the medium is busy during the duration of the PPDU carrying the SR delay entry..

4.4.3.1 Moved by Kiseon Ryu, Seconded by Po-Kai Huang.

4.4.3.2 Discussion – No discussion.

**4.4.3.3 Result: The motion was accepted with no objection.**

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##### 4.4.4 SR Motion #16: Move to accept the changes to the TG draft in doc 11-16/1473r0.

4.4.4.1 Moved by James Wang, Seconded by Bahar Sadeghi.

4.4.4.2 Discussion – No discussion.

**4.4.4.3 Result: The motion was accepted with no objection.**

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Chair asked if there is any business that can be done in 6 minutes. → No response.

## 5 Recess

TGax Recess @9:54 until PM1 (13:30) this afternoon.

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## Thursday, November 10<sup>th</sup>, 2016, PM1 TGax full Session (13:30-15:30)

### 6 The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chairperson of the TGax @ 13:35.

6.1 The agenda file: 11-16-1310-04.

### 7 Announcement

7.1 Chair reminded IEEE 802 and 802.11 IPR P&P.

7.2 Chair asked people to state name and affiliation when addressing for the first time in the session.

7.3 Chair reminded people to do attendance.

### 8 Agenda for this sessions – as approved during AM1 session.

8.1.1 Call Meeting to order

8.1.2 Announcement/Reminder

8.1.2.1 IEEE 802 and 802.11 IPR Policy and procedure.

8.1.2.2 Attendance

8.1.3 Agenda Setting

8.1.4 Presentations

8.1.5 TG Motions

8.1.6 New Business:

8.1.6.1 11-16-1238-04 Setting Quiet Time Period, by Chao-Chun Wang

8.1.7 WG LB, CA Doc Motions

8.1.8 11-16-1537-00, by Guido R. Hiertz.

8.1.9 Goals for January 2017

8.1.10 Teleconference schedule

8.1.11 AOB

8.1.12 Adjourn

### 9 TG Motions (continued from AM1)

#### 9.1 CR Motions

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##### 9.1.1 CR Motion #125 (PHY): Move to accept resolutions to CIDs

- CID 495 as in 11-16/1374r1

- CID 2867 in 11-16/1375r1

- CID 2043, 2044, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2058, 2059, 2062 in doc 11-16/1377r6

- CID 2431 in 11-16/1295r0

- CID 2077 in doc 11-16/1398r1

- CID 1031, 1827, 2472, 2753 in doc 11-16/1448r0

- CID 1116, 2350, 2460, 2461, 1038, 2147, 275 in doc 11-16/1408r0

- CID 1864 and 1849 in doc 11-16/1341r6

- CID 2506 in doc 11-16/1387r3

- CID 2147 in doc 11-16/1522r2

- 1932, 2106, 2572, 2796 in doc 11-16/1340r4

- CID 308, 1619, 2874 in doc 11-16/1371r0

9.1.1.1 Moved by Bin Tian, Seconded by Jianhan Liu.

9.1.1.2 Discussion – No discussion.

9.1.1.3 Result: The motion was accepted with no objection.

9.1.2 CR Motion #126 (PHY): Move to accept the following resolution to CID 85

- Resolution: Rejected

- Reason: The comment doesn't provide an applicable change suggestion to the spec draft

9.1.2.1 Moved by Jianhan Liu, Seconded by Hongyuan Zhang.

9.1.2.2 Discussion – No discussion.

9.1.2.3 Result: The motion was accepted with no objection.

9.1.3 CR Motion #127 (MAC): Move to accept resolutions to CIDs

- CIDs: 150, 1020, 2201 in doc 11-16/1354r0

- CIDs: 135, 658, 2389 in doc 11-16/1358r0

- CIDs: 385, 419, 458, 459, 514, 630, 741, 743, 2844, 2846 in doc 11-16/1359r0

- CIDs: 93, 824, 819, 989, 1067, 2388, 147, 161 in doc 11-16/1360r1

- CID 72 in doc 11-16/1415r2

- CID 193 in doc 11-16/1413r8

- CIDs: 195, 723, 779, 780, 1087, 1088, 2179, 2387, 2672, 2673, and 2674 in doc 11-16/1458r0

- CID 6 and 7 in doc 11-16/1461r1

- CIDs: 969, 1517, 1558, 1560, 1917, 2180 in doc 11-16/1357r0

9.1.3.1 Moved by Reza Hedayat, Seconded by George Cherian.

9.1.3.2 Discussion – No discussion.

9.1.3.3 Result: The motion was accepted with no objection.

9.1.4 CR Motion #128 (MAC): Move to accept resolutions to CIDs

- CID 682 in doc 11-16/1477r2

- CID 991 in doc 11-16/1503r2

- CID 1012 in doc 11-16/1350r0

- CID: 861, 1073, 16, 1398, 1212, 1211, 1176, 964, 823, 798, 797, 781, 733, 1400, 1072, 735 in doc 11-16/1332r3

- CID: 81, 82, 710, 1226, 1235, 1236, 1351, 1707, 1776 in doc 11-16/1336r1

- CID 2186 in doc 11-16/1342 (Editor)

- CID 154 in doc 11-16/1417r0

- CID 203 in doc 11-16/1418r0

- CID 1430, 1703, and 2503 in doc 11-16/1431r1

- CID 1700 and 2504 in doc 11-16/1335r3

9.1.4.1 Moved by Yonggang Fang, Seconded by Reza Hedayat.

9.1.4.2 Note: The motion is referring to the latest revision of 1342 which is r0.

9.1.4.3 Discussion – No discussion.

9.1.4.4 Result: The motion was accepted with no objection.

9.1.5 CR Motion #129 (MAC): Move to accept resolutions to CIDs

- CID 52, 2459, and 2632 in doc 11-16/1464r1

- CID 2113 in doc 11-16/1346r1

- CIDs: 1920, 2441, 2671, 2262, 2396, 2454, 2604, 2605, 1734, 118, 691, 822, 1353 in doc 11-16/1352r1

9.1.5.1 Moved by Reza Hedayat, Seconded by George Cherian.

9.1.5.2 Discussion – No discussion.

9.1.5.3 Result: The motion was accepted with no objection.

9.1.6 CR Motion #130 (MU): Move to accept resolutions to CIDs

- CIDs 2490 and 2505 as proposed in 11-16/1353r1
- CIDs 37, 38, 171, 759, 761, 763, 764, 815, 950, 1219, 1540, 2273, 2320, 2449, 2467, 2636, 2656 and 2910 as proposed in 11-16/1361r1
- CIDs 59, 2652 and 2653 as proposed in 802.11-16/1391r0
- CIDs 2624 and 2738 as proposed in 802.11-16/1392r0
- CID 807 as proposed in 802.11-16/1389r0
- CIDs 53, 54, 56, 57, 604, 1553, 1554, 1555, 1557 and 2655 as proposed in 802.11-16/1457r3
- CID: 729, 1069, 806, 2261, 2909, 1468, 1637, 998, 730, 245, 246, 247, 248, 399, 421, 1464, 588, 256, 812, 1661 in doc 11-16/1339r1

9.1.6.1 Moved by Kiseon Ryu, Seconded by Yonggang Fang.

9.1.6.2 Discussion – No discussion.

9.1.6.3 Result: The motion was accepted with no objection.

9.1.7 CR Motion #131 (SR): Move to accept resolutions to CIDs

- CIDs 187, 224, 803, 1233, 1578, 1579, 2284, 2433, 2666, 2912, 2915, 2916, 2917 in doc 11-16/1337r0.
- CIDs 448, 833, and 1232 in doc 11-16/1430r0
- CID 2492 as provided in submission 11-16/1450r0 and to modify the 802.11ax draft amendment as shown in the submission
- CID 2719 and to modify (adding text to the end of section 25.9.2.1 on page 153 line 15) the 802.11ax draft amendment as proposed in submission 11-16/1440r4

9.1.7.1 Moved by Sameer Alfred Asterjadhi, Seconded by Po-Kai Huang.

9.1.7.2 Discussion – No discussion.

9.1.7.3 Result: The motion was accepted with no objection.

9.1.8 CR Motion #132 (SR): Move to accept resolutions to CIDs

- CID 944, 64, and 2911 in doc 11-16/1476r6 with the exception that 11-16/1476r6 replaces 11-16/461476r4 in the resolution

9.1.8.2 Moved by VK Jones, Seconded by Ron Porat.

9.1.8.3 Discussion

- A member asked to table this motion since there are so many additions to the current draft.
- The presenter replied that this document contains resolutions for the CIDs 944, 64 and 2911, and proposed text discussed in SR ad hoc in the simplest way.
- The previous commenter withdraws the motion to table, but recommends to vote No on this motion.
- This motion is determined to be a recorded vote.

9.1.8.4 Result: Y/N/A = 46/29/38, motion fails.

- The vote record is available in the Annex B of this document.

**9.2 Motion to reconsider****9.2.1 Move to reconsider motion SR-13 on OBSS\_PD SR.****9.2.1.1 Moved by Sriram Venkateswaran, Seconded Saishankar Nandagopalan.****9.2.1.1.1. Discussion**

- A member mentioned that this is out of order. The mover mentioned that he voted “No” for the SR motion #13, however it is worth to reconsider.

**9.2.1.2. Result: Motion to reconsider passed with no objection.**

9.2.1.3. Go back to the main motion

**9.2.1.4. Discussion – No discussion.****9.2.1.5. Result: Y/N/A = 46/18/38, motion fails (<75%)**

- The vote record is available in the Annex C of this document.

**9.3 WG Motions****9.3.1 WG LB Motion:**

- Instruct the editor to prepare TGax Draft D1.0
- Approve a 30 day Working Group Technical Letter Ballot asking the question “Should TGax Draft 1.0 be forwarded to Sponsor Ballot?”

**9.3.1.1 Moved by Robert Stacy, Seconded by Vinko Erceg.****9.3.1.2 Discussion – No discussion.****9.3.1.3 Result: Y/N/A = 89/0/6, motion passes.****9.3.2 Coexistence Assurance Document: Move to adopt 11-16/1348r2 as coexistence assurance document for 802.11ax amendment.****9.3.2.1 Moved by Robert Stacy, Seconded by Yasuhiko Inoue.****9.3.2.2 Discussion – No discussion.****9.3.2.3 Result: Y/N/A = 82/0/7, motion passes.****10 Presentation****10.1 Guido R. Hiertz (Ericsson) presented “TGax ad hoc meeting,” based on the submission 11-16-1537-00.**

## 10.1.1 Summary

10.1.1.1 Guido proposes an ad hoc meeting in Stockholm, Sweden, just before the IEEE 802 Wireless Session January 2017.

10.1.1.2 Ericsson will host the meeting

## 10.1.2 Discussion

10.1.2.1 The editor will create draft 1.0 in two or three week after the November session and a 30-day WG letter ballot starts after that. The ballot will be closed early January. We can assign comments during the teleconferences in January.

10.1.2.2 A member mentioned that it is difficult to prepare the resolution before the January 2017 meeting considering the sequence of events we will have.

**10.1.3 Motion: Authorize TGax to hold an ad-hoc meeting on January 11-13/2017 in Stockholm, Sweden, for the purpose of comment resolution.****10.1.3.1 Moved by Guido R. Hiertz, Seconded by Hakan Persson**

**10.1.3.2 Discussion**

11.1.3.2.1. A member mentioned that it is generally good to have an ad hoc meeting to accelerate the comment resolution process, however January is not the right timing.

11.1.3.2.2. There were similar comments.

**10.1.3.3 Result: Y/N/A = 9/52/32, motion fails.**

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**11 Teleconferences**

11.1 Weekly conference calls are planned after September session.

- Thursday Dec. 1<sup>st</sup>, 8<sup>th</sup> and 15<sup>th</sup>, 2016 21:00 - 23:00 (ET) – For PAR Verification
- Thursday Jan. 5<sup>th</sup>, 2017 11:00 - 13:00 (ET)
- Thursday Jan. 12<sup>th</sup>, 2017 20:00 - 22:00 (ET)

**12 AOB**

12.1 No other business to conduct.

**13 Adjournment**

13.1 TGax adjourned for the week @ 15:35.

**Thursday, November 10<sup>th</sup>, 2016, PM2 TGax full Session (16:00-18:00)**

Upon completion of its business, TGax Thursday PM2 session was cancelled.

**Annex A. Vote record of the SR Motion #13 - Thursday, November 10<sup>th</sup>, 2016, AM1 session.**

**Annex B. Vote record of the CR Motion #132 (SR) - Thursday, November 10<sup>th</sup>, 2016, PM1 session.**

**Annex C. Vote record of the SR Motion #13 (reconsider) - Thursday, November 10<sup>th</sup>, 2016, PM1 session.**

The results are contained in separate tabs the excel file below..



802.11 TGax roll  
call vote November