

IEEE P802.11 - TASK GROUP AX - GROUP INFORMATION UPDATE

Status of Project IEEE 802.11ax

High Efficiency (HE) Wireless LAN Task Group

Task Group Leadership

Chair	Osama Aboul-Magd (Huawei Technologies)
1st Vice Chair	Ron Porat (Broadcom Ltd.)
2nd Vice Chair	Alfred Asterjadhi (Qualcomm)
Secretary	Yasuhiko Inoue (NTT)
Technical Editor	Robert Stacey (Intel)

Background

In May 2013, the High Efficiency WLAN Study Group (HEW SG), a study group within IEEE 802.11 working group had started its activity to consider the improvement of spectrum efficiency to enhance the system throughput/area in high density scenarios of APs and/or STAs.

The study group was created based on the following straw poll and motion:

< Straw Poll >

Do you support starting a new study group called "high efficiency WLAN" to enhance 802.11 PHY and MAC in 2.4 and 5GHz with a focus on:

- Improving spectrum efficiency and area throughput
- Improving real world performance in indoor and outdoor deployments
 - in the presence of interfering sources, dense heterogeneous networks
 - in moderate to heavy user loaded APs

< Motion >

Request an approval by IEEE 802 LMSC to form an 802.11 Study Group to consider High-efficiency WLAN [as described in doc 11-13-0339r2] with the intent of creating a PAR and five criteria.

The HEW SG has successfully developed PAR and CSD documents and the project 802.11ax has started in May 2014.

Task Group Documents

The latest version of the task group official documents can be found here.

- [11-14-0165](#) Project Authorization Request (PAR)

- [11-14-0169](#) Criteria for Standard Development (CSD)
- [11-14-0938](#) TGax Selection Procedure
- [11-14-0980](#) TGax Simulation Scenarios
- [11-14-0571](#) TGax Evaluation Methodology
- [11-14-0882](#) TGax Channel Models
- [11-14-1009](#) TGax Functional Requirements
- [11-15-0132](#) TGax Specification Framework

Previous Meetings

Links to the reports of previous meetings.

TGax	2020	November 2020	September 2020	July 2020
		May 2020	March 2020	January 2020
	2019	November 2019	September 2019	July 2019
		May 2019	March 2019	January 2019
	2018	November 2018	September 2018	July 2018
		May 2018	March 2018	January 2018
	2017	November 2017	September 2017	July 2017
		May 2017	March 2017	January 2017
	2016	November 2016	September 2016	July 2016
		May 2016	March 2016	January 2016
	2015	November 2015	September 2015	July 2015
		May 2015	March 2015	January 2015
	2014	November 2014	September 2014	July 2014
		May 2014	---	---
HEW SG	2014	---	March 2014	January 2014
	2013	November 2013	September 2013	July 2013
		May 2013	---	---

November 2020 — Online Meeting

The IEEE 802 Plenary Session November 2020 was held online.

The P802.11ax D8.0 was in the process of the second IEEE-SA recirculation ballot from November 3rd to 12th, 2020.

TGax had two online meetings during the November 2020 plenary.

Main documents

The TGax meeting agenda, draft meeting minutes and closing report can be found here.

- [11-20-1552-21](#), TGax CRC Teleconference Agendas: October - November - December 2020
- [11-20-1785-01](#), (draft) TGax November 2020 Meeting Minutes
- [11-20-1822-00](#), TGax November 2020 Closing Report

Accomplishments

- The TG was scheduled for two time slots - Tuesday @ 16:00 ET and Thursday @ 19:00 ET
 - The TG reviewed and approved the report to the EC requesting conditional approval to forward to RevCom.
- The TG approved r3 of the report. R4 is on the server updating the number of unsatisfied comments.

The report is available at:

- <https://mentor.ieee.org/802.11/dcn/20/11-20-1771-04-00ax-p802-11ax-report-to-ec-on-conditional-approval-to-forward-draft-to-revcom.pptx>
- The TG reaffirmed the TG CSD.
- <https://mentor.ieee.org/802.11/dcn/14/11-14-0169-03-0hew-ieee-802-11-hew-sg-proposed-csd.docx>
- **The TG is on time to submit the draft (8.0) for the January 2021 RevCom meeting.**

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October 2020 — Status Update

- The first IEEE-SA recirculation ballot on the P802.11ax D7.0 completed successfully with 88% approval ratio. 132 comments were received.
- TGax continued two or three teleconferences to resolve the comments for D7.0.
- During TGax CRC teleconference on October 30th, TGax completed comment resolution for D7.0 and passed the motion
 - to instruct the TGax technical editor to create the IEEE 802.11ax draft 8.0 incorporating the resolutions, and
 - to approve a 10-day IEEE-SA Recirculation Ballot asking the question " Should P802.11ax Draft 8.0 be forwarded to RevCom?"

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September 2020 — Online Meeting

The IEEE 802 Wireless Interim Session September 2020 was held online.

The P802.11ax D7.0 was in the process of the first IEEE-SA recirculation ballot and the TGax had one online meeting during the week.

Main documents

The TGax meeting agenda and meeting minutes can be found here.

- [11-20-1169-18](#), TGax CRC Teleconference Agendas: August - September 2020
- [11-20-1522-00](#), TGax September 2020 Meeting Minutes

Accomplishments

- Approved TGax CRC teleconference minutes from July to August, 2020
- Reaffirmed Ron Porat (Broadcom) and Alfred Asterjadhi (Qualcomm) as the fist and the second vice-chairs, respectively.
- Reaffirmed Yasuhiko Inoue (NTT) as the TGax secretary.
- Reviewed the IEEE-SA Comment Resolution Guideline.

Timeline

- RevCom meeting scheduled at January 26, 2021.
 - Deadline for submission is December 11, 2020.
- 802 WG virtual meeting is scheduled during the period October 30 to November 13, 2020.
 - The CRC needs the 802.11 WG and 802 WG approvals to proceed to RevCom in January.
- The CRC seems to have about 40 days to complete resolutions of all comments received on draft 7.0.

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- TGax had one session continued two teleconferences to resolve the comments for D6.0.
- During TGax CRC teleconference on August 27th, TGax completed comment resolution for D6.0 and passed the motion
 - to instruct the TGax technical editor to create the IEEE 802.11ax draft 7.0 incorporating the resolutions, and
 - to approve a 15-day IEEE-SA Recirculation Ballot asking the question " Should P802.11ax Draft 7.0 be forwarded to RevCom?"
- The 15-day IEEE-SA Recirculation Ballot on the IEEE 802.11ax D7.0 has opened on **September 3rd** and will close on **September 17th, 2020, 23:59 (ET)**.

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August 2020 — Status Update

- TGax continued two teleconferences to resolve the comments for D6.0.
- During TGax CRC teleconference on August 27th, TGax completed comment resolution for D6.0 and passed the motion
 - to instruct the TGax technical editor to create the IEEE 802.11ax draft 7.0 incorporating the resolutions, and
 - to approve a 15-day IEEE-SA Recirculation Ballot asking the question " Should P802.11ax Draft 7.0 be forwarded to RevCom?"
- The 15-day IEEE-SA Recirculation Ballot on the IEEE 802.11ax D7.0 has opened on **September 3rd** and will close on **September 17th, 2020, 23:59 (ET)**.

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July 2020 — Online Meeting

The IEEE 802 Plenary July 2020 Session was held online.

TGax had one meeting during the plenary session and another one after closing plenary.

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-20-0538-45](#), TGax CRC Teleconference march-July 2020 Teleconference Agendas
 - [11-20-1103-00](#), (Draft) TGax July 2020 Meeting Minutes

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May 2020

The IEEE 802 Wireless Interim Session May 2020 was also cancelled due to COVID-19.

In the meantime, TGax continued to accelerate comment resolution process by two teleconferences every week.

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March 2020

The IEEE 802 Plenary Session March 2020 was cancelled due to COVID-19.

In the meantime, TGax accelerated comment resolution process by having two teleconferences per week.

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January 2020 — Irvine, CA

The TGax had only one meeting during the week since the initial IEEE-SA ballot on the IEEE 802.11ax D6.0 is going on.

	Monday	Tuesday	Wednesday	Thursday
AM1				
AM2	TGax (full session)			
PM1				
PM2				
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-19-2118-02](#), TGax January 2020 Meeting Agenda
 - [11-20-0190-00](#), TGax January 2020 Closing Report
 - [11-20-0148-00](#), (Draft) TGax January 2020 Irvine Meeting Minutes

Achievements

1. Work Completed

- The TG was scheduled for one time slot on Monday AM-2
 - Approved November F2F meeting minute and December 13 teleconference minutes.
 - Decided on a TG teleconference schedule.
 - Decided no to have an ad hoc (CRC) meeting in March.
 - Reviewed the rules to be followed during the CRC operation.
- Draft 6.0 is in SA ballot. The ballot closes on January 24th.
 - Please vote and submit your comments by the deadline.

2. Submissions
 - TGax received no submission to discuss during January 2020 session.
3. Timeline
 - No changes to current timeline.

Goals for the March 2020 session

- comments received on draft D6.0.
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Teleconferences

Following TGax teleconferences were authorized during the January 2020 session.

Thursday	January 30 th , 2020	10:00 - 12:00 (ET)
Thursday	February 13 th & 27 th , 2020	10:00 - 12:00 (ET)
Thursday	February 6 th , 20 th & March 5 th , 2020	20:00 - 22:00 (ET)

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November 2019 — Waikoloa, HI

TGax had eight meeting slots during the week.

All sessions are full TG session.

	Monday	Tuesday	Wednesday	Thursday
AM1		TGax (full session)	TGax (full session)	
AM2		TGax (full session)		TGax (full session)
PM1			TGax (full session)	
PM2	TGax (full session)	TGax (full session)		TGax (full session)
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-19-1732-09](#), TGax November 2019 Meeting Agenda
 - [11-19-2096-00](#), TGax November 2019 Closing Report
 - [11-19-2012-00](#), (Draft) TGax November 2019 Waikoloa Meeting Minutes
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Achievements

1. Work Completed

- The group completed the resolution of all comments received on draft 5.0.
- Motion passed in the TG to instruct the Editor to prepare draft 6.0 and start a 15-day recirculation ballot.
- A new revision of the TG Coexistence Assurance document is available.
 - [TGax Coexistence Assurance Document](#)
- The EC Report on conditional approval to go to SA ballot is available at [11-19/2063](#).

2. Technical Submissions

TGax received following submissions.

- [11-19-1684](#), "CR on dot11HECCAIndicatinMode," Robert Stacey (Intel)
- [11-19-1796](#), "Comments on TGax CA doc r6," Eldad Perahia (HPE-Aruba)
- [11-19-1810](#), "11ax D5.0 Comment Resolution for NAV related comments," Po-Kai Huang (Intel)
- [11-19-1814](#), "11ax D5.0 MAC Comment Resolution for SM Power Save," Po-Kai Huang (Intel)
- [11-19-1816](#), "11ax D5.0 MAC Comment Resolution for Duration-based RTS/CTS," Po-Kai Huang (Intel)
- [11-19-1819](#), "Resolution to comment to subclause 9.3.1.7.1" Tomoko Adachi (Toshiba)
- [11-19-1831](#), "Comment resolutions for miscellaneous comments," Alfred Asterjadhi (Qualcomm)
- [11-19-1832](#), "Comment resolutions for subclause 26.8," Alfred Asterjadhi (Qualcomm)/Robert Stacey (Intel)
- [11-19-1833](#), "Comment resolution for subclause 26.15," Alfred Asterjadhi (Qualcomm)
- [11-19-1834](#), "Comment resolution for subclause 26.17," Alfred Asterjadhi (Qualcomm)
- [11-19-1835](#), "Comment resolutions for TWT IE," Alfred Asterjadhi (Qualcomm)
- [11-19-1871](#), "Resolution to HESIGB and Related Comments," Brian Hart (Cisco Systems)
- [11-19-1896](#), "Comment Resolutions for 11ax D5.0 HE PHY Service Interface Section," Bo Sun (ZTE)
- [11-19-1905](#), "Resolution for CIDs related to Multiple BSSID," Abhishek Patil (Qualcomm)
- [11-19-1906](#), "Resolution for CIDs related to BSS Color," Abhishek Patil (Qualcomm)
- [11-19-1922](#), "Some 802.11ax comment resolutions," Jarkko Knecht (Apple)
- [11-19-1936](#), "Ack related comments," George Cherian (Qualcomm)
- [11-19-1941](#), "CIDs on Clause 27.3.10.7 for D5.1," Jianhan Liu (MediaTek)
- [11-19-1947](#), "MAC CR on Fragmentation," Ming Gan (Huawei Technologies)
- [11-19-1948](#), "MAC CR on CID 22386 and 22387," Ming Gan (Huawei Technologies)
- [11-19-1949](#), "CR for CID 22030, 22031, 22032, 22447," Xiaogang Chen (Intel)
- [11-19-1956](#), "CR for BSS Color Related CIDs," Xiaofei Wang (InterDigital Communications)
- [11-19-1957](#), "LB244 CR MAC Miscellaneous," Yongho Seok (MediaTek)
- [11-19-1977](#), "CR for BSS Color Related CIDs Part 2," Xiaofei Wang (InterDigital Communications)
- [11-19-1983](#), "Remaining PHY Math comment resolutions," Yang Zhang (Marvell Semiconductor)
- [11-19-1986](#), "Sounding CRs 11ax D5.0," Menzo Wentink (Qualcomm)
- [11-19-1995](#), "CR for MU EDCA parameters," Laurent Carioou (Intel)
- [11-19-1996](#), "CR for OPS," Laurent Carioou (Intel)
- [11-19-1997](#), "CR for Out of band discovery," Laurent Carioou (Intel)
- [11-19-1998](#), "CR for misc CIDs," Laurent Carioou (Intel)
- [11-19-2004](#), "D5.0 PHY C," Youhan Kim (Qualcomm)
- [11-19-2016](#), "CR BQR," Zhou Lan (Broadcom)
- [11-19-2020](#), "11ax D5.0 comment resolution of various subclauses," Liwen Chu (Marvell)
- [11-19-2021](#), "Security parameter constraints," Jouni Malinen (Qualcomm)
- [11-19-2023](#), "CRs on MCS Tables," Bin Tian (Qualcomm)
- [11-19-2025](#), "11ax D5.0 comment resolution 26.6.3.1," Liwen Chu (Marvell)
- [11-19-2030](#), "CR on CID 22392," Ross Jian Yu (Huawei Technologies)
- [11-19-2035](#), "Transmit Spectral Mask for Preamble Punctured Channels," Dorin Viorel (Quantenna Communications)

- [11-19-2041](#), "Updated Channelization for 6 GHz," Imran Latif (Quantenna Communications)
- [11-19-2047](#), "LB244 CR for FTM CIDs," Jonathan Segev (Intel)
- [11-19-2048](#), "Proposed resolution for CIDs Related to Quiet Time Period," Kaiying Lu (MediaTek)
- [11-19-2053](#), "Proposed resolution for CIDs Related to Quiet Time Period," Kaiying Lu (MediaTek)
- [11-19-2057](#), "CID 22413, 22414," Youhan Kim (Qualcomm)
- [11-19-2068](#), "11ax D5.0 comment resolution of various subclauses," Liwen Chu (Marvell)
- [11-19-2075](#), "Proposed resolution for CID 22058," Kaiying Lu (MediaTek)
- [11-19-2077](#), "CID 22417," Youhan Kim (Qualcomm)
- [11-19-2083](#), "CR for RNR," Laurent Cariou (Intel)

3. Timeline

No discussion on the timeline during the week.

However, TGax timeline was updated as shown [here](#).

Goals for the January 2020 session

- Start working on comments received on draft D6.0.

Teleconferences

No TGax teleconferences were authorized during the November 2019 session. A teleconference may be scheduled with a 10-day notice.

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September 2019 — Hanoi, Vietnam

TGax had nine meeting slots during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full session)	TGax (full session)
AM2	TGax (full session)	TGax (MAC ad hoc) TGax (MU ad hoc)		
PM1			TGax (full session)	TGax (full session)
PM2	TGax (MAC ad hoc) TGax (PHY ad hoc)	TGax (MAC ad hoc) TGax (PHY ad hoc)		
PM3	TGax (full session)			

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found [here](#).

- TGax
 - [11-19-1409-06](#), TGax September 2019 Meeting Agenda
 - [11-19-1708-00](#), TGax September 2019 Closing Report
 - [11-19-1630-00](#), TGax September 2019 Hanoi Meeting Minutes
- TGax PHY ad hoc

- [11-19-1634-01](#), TGax September 2019 Meeting - PHY Ad hoc Agenda
 - TGax MAC ad hoc
 - [11-19-1409-06](#), TGax September 2019 Meeting Agenda (Agenda for the MAC ad hoc is contained in the TGax agenda)
 - TGax MU ad hoc
 - [11-19-1649-02](#), September 2019 TGax MU Ad hoc Meeting Agenda
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Achievements

1. Work Completed

- The group completed the resolution of all comments received on draft 4.0.
- Motion passed in the TG to instruct the Editor to prepare draft 5.0 and start a 15-day recirculation ballot.
- Motion passed to approve the new revision of the TG Coexistence Assurance document.
 - [TGax Coexistence Assurance Document](#)
- Motion passed to approve the TG MDR

2. Technical Submissions

TGax received following submissions.

- PHY submissions
 - [11-19-0422](#), "CR for CID 21501, 21502, 21436," Xiaogang Chen (Intel)
 - [11-19-1377](#), "11ax D4.2 Comment Resolution for PHY Introduction," Sameer Vermani (Qualcomm)
 - [11-19-1386](#), "Resolution to PHY-related CID 21366," Brian Harts (Cisco Systems)
 - [11-19-1515](#), "Remaining PHY Math comment resolutions," Yan Zhang (Marvell)
 - [11-19-1530](#), "LB238 CID 20742, 20751," Youhan Kim (Qualcomm)
 - [11-19-1531](#), "LB238 CID 20785, 20934," Youhan Kim (Qualcomm)
 - [11-19-1560](#), "D4.0 CR PHY Misc," Tianyu Wu (Samsung)
 - [11-19-1581](#), "HE-SIG-A fields proposed text changes," Yan Zhang (Marvell)
- MAC submissions
 - [11-19-0463](#), "Comment resolutions for Miscellaneous 11ax CID," David Kloper (Cisco Systems)
 - [11-19-0552](#), "CID 20073," Abhishek Patil (Qualcomm)
 - [11-19-0594](#), "Comment resolutions for transmit power control - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-0619](#), "Proposed Resolutions to selected comments on D4.0," Mark Rison (Samsung)
 - [11-19-0770](#), "LB238 CR PPDU format, BW, MCS, NSS and DCM selection," Yongho Seok (MediaTek)
 - [11-19-0966](#), "Comment resolutions for miscellaneous TWT - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-0968](#), "Proposed changes for some bug fixes and clarifications," Alfred Asterjadhi (Qualcomm)
 - [11-19-1064](#), "CR Disallowed Subchannels," Matthew Fischer (Broadcom)
 - [11-19-1137](#), "11ax sounding comments D4.0," Menzo Wentink (Qualcomm)
 - [11-19-1150](#), "Resolution for CIDs related to Co-located BSSID," Abhishek Patil (Qualcomm)
 - [11-19-1155](#), "LB-238 Miscellaneous Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
 - [11-19-1167](#), "11ax D4.2 MAC Comment Resolution for SM Power Save Part II," Po-Kai Huang (Intel)
 - [11-19-1209](#), "11ax D4.0 CR for TXOP Duration-based RTS Threshold," Huizhao Wang (Quantenna Communications)
 - [11-19-1219](#), "Comment resolution for one CID," Alfred Asterjadhi (Qualcomm)
 - [11-19-1275](#), "Proposed Resolution to TGax D4.0 CR 20268," Srinivas Kandala (Samsung)
 - [11-19-1388](#), "Comment resolutions for non-AP STA scanning - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-1390](#), "Comment resolutions for additional rules for preassociation," Alfred Asterjadhi (Qualcomm)
 - [11-19-1496](#), "Comment resolutions for 2 CIDs," Alfred Asterjadhi (Qualcomm)
 - [11-19-1520](#), "Resolution for CIDs related to Multiple BSSID - Part 3," Abhishek Patil (Qualcomm)
 - [11-19-1590](#), "CBF contents padding to 8bits," Huizhao Wang (Quantenna Communications)
 - [11-19-1610](#), "Comment resolutions for Reason Code CIDs," Pooya Monajemi (Cisco Systems)
 - [11-19-1618](#), "CR for CIDs 20475, 20788 and 21618," Jarkko Knecht (Apple)

- [11-19-1629](#), "11ax D4.0 MAC miscellaneous CIDs," Liwen Chu (Marvell)
- [11-19-1631](#), "Proposed resolution for CIDs Related to Quiet Time Period," Kaiying Lu (MediaTek)
- [11-19-1635](#), "Comment resolution on CID 20566," Edward Au (Huawei Technologies)
- [11-19-1655](#), "11ax Comment Resolution Misc.," Zhou Lan (Broadcom)
- [11-19-1658](#), "LB238 CR MAC Miscellaneous Part 2," Yongho Seok (MediaTek)
- [11-19-1661](#), "Comment resolution on CIDs 20644 and 20645," Edward Au (Huawei Technologies)
- [11-19-1662](#), "Resolutions to comments 20111 and 21011 of LB 238," Srinivas Kandala (Samsung)
- [11-19-1667](#), "Resolutions for some comments on 11ax/D4.0 (LB238)," Mark Rison (Samsung)
- [11-19-1668](#), "EOF handling in ack-enabled A-MPDU," Jarkko Knecht (Apple)
- [11-19-1673](#), "Proposed Resolution to TGax D4.0 CR20268," Srinivas Kandala (Samsung)
- [11-19-1676](#), "MAC CR Fragment Flush," Ming Gan (Huawei Technologies)
- [11-19-1682](#), "Comment resolutions for UORA," Chittabrata Ghosh (Intel)
- [11-19-1684](#), "CR on dot11HECCAIndicationMode," Robert Stacey (Intel)
- [11-19-1690](#), "Comment Resolution on MU Operation Part 2," Lochan Verma (Qualcomm)
- MU submissions
 - [11-19-0765](#), "CR MU EDCA Timer," Zhou Lan (Broadcom)
 - [11-19-0908](#), "MU EDCA parameter update frame," Matthew Fischer (Broadcom)
 - [11-19-0917](#), "UORA Misc," Matthew Fischer (Broadcom)
 - [11-19-1186](#), "Comment Resolution on MU Operation," Lochan Veram (Qualcomm)
 - [11-19-1609](#), "MAC CR MU cascading," Ming Gan (Huawei Technologies)
 - [11-19-1627](#), "Last CIDs and fixes," Laurent Cariou (Intel)
- SR submissions
 - [11-19-0613](#), "SRP Comments," Matthew Fischer (Broadcom)
- Other submissions
 - [11-16-1348](#), "TGax Coexistence Assurance Document," Eldad Perahia (HPE/Aruba)
 - [11-19-0292](#), "Comments on TGax D4.0," Robert Stacey (Intel)
 - [11-19-1236](#), "Comment resolution on MIBs for LB238," Edward Au (Huawei Technologies)
 - [11-19-1243](#), "Comment Resolution on PICS for LB238," Edward Au (Huawei Technologies)

3. Timeline

No discussion on the timeline during the week.

However, TGax timeline was updated as shown [here](#).

Goals for the November 2019 session

- Start working on comments received on draft D5.0.

Teleconferences

No TGax teleconferences were authorized during the September 2019 session. However, one teleconference was announced by a 10-day notice.

Tuesday	October 29 th , 2019	13:00 - 15:00 (ET)
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July 2019 — Vienna, Austria

TGax had ten meeting slots during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax ad hoc (full session)			
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full session)
PM1	TGax (full session)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax full (PHY topic)	
PM2		TGax ad hoc (full session)	TGax full (MAC topic)	TGax (full session)
PM3	TGax (MAC ad hoc) TGax (MU ad hoc)			

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-19-0983-06](#), TGax July 2019 Meeting Agenda
 - [11-19-1347-00](#), TGax July 2019 Closing Report
 - [11-19-1264-00](#), TGax July 2019 Vienna Meeting Minutes
- TGax PHY ad hoc
 - [11-19-1274-03](#), TGax July 2019 Meeting Agenda - PHY Adhoc
 - 11-19-xxxx-yy, (Draft) TGax PHY Ad Hoc July 2019 Meeting Minutes (not available)
- TGax MAC ad hoc
 - [11-19-1279-02](#), TGax MAC Adhoc July 2019 Meeting Agenda
 - [11-19-1294-00](#), (Draft) July 15 PM3 TGax MAC Ad hoc meeting minutes
 - [11-19-1312-00](#), (Draft) July 16 TGax MAC Ad hoc meeting minutes
- TGax MU ad hoc
 - [11-19-1292-01](#), July 2019 TGax MU Ad hoc Meeting Agenda
 - 11-19-xxxx-yy, (Draft) TGax MU ad hoc July 2019 meeting minutes (not available)

Achievements

1. Work Completed

- More time is needed to complete the resolution of all comments submitted during LB 238 on draft D4.0.
 - Almost 260 technical comments are remaining.

2. Technical Submissions

TGax received following submissions.

- PHY submissions
 - [11-19-0422](#), "CR for CID 21497, 21501, 21502," Xiaogang Chen (Intel)
 - [11-19-0793](#), "Remaining PHY Math comment resolutions," Yan Zhang (Marvell)
 - [11-19-0826](#), "CR on DCM and STBC Combinations," Youhan Kim (Qualcomm)
 - [11-19-0827](#), "CR on Punctured Non-HT Duplicate PPDU," Youhan Kim (Qualcomm)
 - [11-19-0830](#), "CR on Clause 17," Youhan Kim (Qualcomm)
 - [11-19-0831](#), "D4.0 Comment Resolution - Part 2," Youhan Kim (Qualcomm)

- [11-19-0836](#), "D4.0 Comment Resolution - Part 3," Youhan Kim (Qualcomm)
- [11-19-0837](#), "CR on HE Capabilities," Youhan Kim (Qualcomm)
- [11-19-0858](#), "PHY CR in Clause 10," Youhan Kim (Qualcomm)
- [11-19-0866](#), "CR for Misc.," Xiangang Chen (Intel)
- [11-19-0971](#), "CR on CID 20760 and 20793," Ross Jian Yu (Huawei Technologies)
- [11-19-0972](#), "Remaining CR on SIG-B Part I," Ross Jian Yu (Huawei Technologies)
- [11-19-0973](#), "Resolution to CID20718," Yujin Noh (Newracom)
- [11-19-1013](#), "Spec Text Changes on MCS Table," Ross Jian Yu (Huawei Technologies)
- [11-19-1125](#), "Remaining CR on SIG-B Part II," Dandan Liang (Huawei Technologies)
- [11-19-1127](#), "Comment Resolution on CIDs on Clause 27.3.10.7," Jianhan Liu (MediaTek)
- [11-19-1150](#), "Proposed resolutions to comments on clause 26.3.10.15 (Packet Extension)," Ross Jian Yu (Huawei Technologies)
- [11-19-1185](#), "CR on PHY SIGB," Ming Gan (Huawei Technologies)
- [11-19-1225](#), "D4.0 Comment Resolution - Part 3," Youhan Kim (Qualcomm)
- [11-19-1226](#), "D4.0 Comment Resolution - Part 4," Youhan Kim (Qualcomm)
- [11-19-1271](#), "PHY Miscellaneous Comment Resolution," Sameer Vermani (Qualcomm)
- MAC submissions
 - [11-19-0339](#), "11ax D4.0 MAC Comment Resolution for Co-hosted BSSID," Po-Kai Huang (Intel)
 - [11-19-0414](#), "CR for NFRP," Laurent Cariou (Intel)
 - [11-19-0417](#), "CR for 6 GHz out of band," Laurent Cariou (Intel)
 - [11-19-0488](#), "CR for Reduced Neighbor Report," Jarkko Kneckt (Apple)
 - [11-19-0494](#), "Resolution for CID 20346 related to BSS Color," Kaiying Lu (ZTE)
 - [11-19-0594](#), "Comment resolutions for transmit power control - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-0604](#), "11ax D4.1 MAC Comment Resolution for NAV part I," Po-Kai Huang (Intel)
 - [11-19-0696](#), "OMI Comment Resolutions," Jarkko Kineckt (Apple)
 - [11-19-0734](#), "11ax D4.0 Comment Resolution 9.7.3," Liwen Chu (Marvell)
 - [11-19-0735](#), "11ax D4.0 Comment Resolution 10.24," Liwen Chu (Marvell)
 - [11-19-0736](#), "11ax D4.0 Comment Resolution 10.32.2," Liwen Chu (Marvell)
 - [11-19-0737](#), "11ax D4.0 comment-resolution 9.2.4.6, 9.4.2.242.2," Liwen Chu (Marvell)
 - [11-19-0745](#), "MAC CR for subclause 9.4.2," Ming Gan (Huawei)
 - [11-19-0748](#), "11ax D4.0 Comment Resolution 26.2.8," Liwen Chu (Marvell)
 - [11-19-0750](#), "11ax D4.0 comment-resolution 26.5.3.4," Liwen Chu (Marvell)
 - [11-19-0769](#), "CR for NFRP," Laurent Cariou (Intel)
 - [11-19-0771](#), "LB238 CR HE Subchannel Selective Transmission," Yongho Seok (MediaTek)
 - [11-19-0835](#), "Comment resolution for subclause 26.2.2," Kaiying Lu (MediaTek)
 - [11-19-0910](#), "Comment resolutions for fast passive scanning," Alfred Asterjadhi (Qualcomm)
 - [11-19-0915](#), "Fragment Flushing," Matthew Fischer (Broadcom)
 - [11-19-0961](#), "Comment resolutions for group addressed MPDUs delivery," Alfred Asterjadhi (Qualcomm)
 - [11-19-0962](#), "Comment resolutions for non-AP STA scanning (26.17.2.3.3)," Alfred Asterjadhi (Qualcomm)
 - [11-19-0963](#), "Comment resolutions for HE BSS operation - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-0964](#), "Comment resolutions for additional rules for preassociation," Alfred Asterjadhi (Qualcomm)
 - [11-19-0965](#), "Comment resolutions for HE BSS operation in 6 GHz - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-0967](#), "Comment resolutions for fast passive scanning - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-1023](#), "11ax D4.0 Comment Resolution 21.6.4.1," Liwen Chu (Marvell)
 - [11-19-1035](#), "11ax D4.0 Comment Resolution 26.6.4.2 26.6.4.4," Liwen Chu (Marvell)
 - [11-19-1061](#), "Comment resolutions for HE FTM in 6 Ghz," Alfred Asterjadhi (Qualcomm)
 - [11-19-1064](#), "CR Disallowed Subchannels," Matthew Fischer (Broadcom)
 - [11-19-1138](#), "LB238 CR HLA," Yongho Seok (MediaTek)
 - [11-19-1139](#), "LB238 CR AID assignment," Yongho Seok (MediaTek)

- [11-19-1141](#), "LB238 CR MAC Miscellaneous," Yongho Seok (MediaTek)
- [11-19-1147](#), "CID 20000," Abhishek Patil (Qualcomm)
- [11-19-1148](#), "Resolution for CIDs related to Multiple BSSID - Part 2," Abhishek Patil (Qualcomm)
- [11-19-1149](#), "Resolution for CIDs 21172 and 20013," Abhishek Patil (Qualcomm)
- [11-19-1155](#), "LB-238 Miscellaneous Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
- [11-19-1161](#), "CR for Misc CIDs," Laurent Cariou (Intel)
- [11-19-1163](#), "Proposed resolution for CIDs Related to Quiet Time Period," Kaiying Lu (MediaTek)
- [11-19-1167](#), "11ax D4.2 MAC Comment Resolution for SM Power Save Part II," Po-Kai Huang (Intel)
- [11-19-1183](#), "Comment Resolution on Trigger Frame Format," Lochan Verma (Qualcomm)
- [11-19-1184](#), "CR for MAC Misc," Ming Gan (Huawei Technologies)
- [11-19-1200](#), "Resolutions to comments 20104, 20648, 21124, and 21469," Tomoko Adachi (Toshiba)
- [11-19-1209](#), "11ax D4.0 sounding comments," Huizhao Wang (Quantenna Communications)
- [11-19-1211](#), "Ack related CRs," George Cherian (Qualcomm)
- [11-19-1219](#), "Comment resolutions for one CID," Alfred Asterjadhi (Qualcomm)
- [11-19-1222](#), "CR for 20253, 20255, 20264 and 20265," Jarkko Knecht (Apple)
- [11-19-1236](#), "Comment resolution on MIBs for LB238," Edward Au (Huawei Technologies)
- [11-19-1237](#), "Proposed resolution for some CIDs in section 3.2 and 4.3.15a," Guoqing Li (Apple)
- [11-19-1243](#), "Comment resolution on PICs for LB238," Edward Au (Huawei Technologies)
- [11-19-1259](#), "LB 238 Annex G Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
- [11-19-1275](#), "Proposed Resolution to Tgax D4.0 CR20268," Srinivas Kandala (Samsung)
- MU submissions
 - [11-19-0765](#), "CR MU EDCA Timer," Zhou Lan (Broadcom)
 - [11-19-0908](#), "MU EDCA parameters update frame," Matthew Fischer (Broadcom)
 - [11-19-0917](#), "UORA Misc," Matthew Fischer (Broadcom)
 - [11-19-1130](#), "11ax D4.0 Comment Resolution for RDG MU," Yunbo Li (Huawei Technologies)
 - [11-19-1140](#), "LB238 CR UL MU Power Capabilities," Yongho Seok (MediaTek)
 - [11-19-1186](#), "Comment Resolution on MU Operation," Lochan Verma (Qualcomm)
 - [11-19-1204](#), "CR for CID20624," Laurent Cariou (Intel)
 - [11-19-1217](#), "Resolution for CID 21110," Abhishek Patil (Qualcomm)
 - [11-19-1218](#), "Resolution for CIDs related to UORA - Part 2," Abhishek Patil (Qualcomm)
 - [11-19-1263](#), "11ax D4.2 RA Setting for Response to Trigger frame," Po-Kai Huang (Intel)
- SR submissions
 - [11-19-0416](#), "CR for Spatial reuse," Laurent Cariou (Intel)
 - [11-19-0613](#), "SRP Comments," Matthew Fischer (Broadcom)
- Other submissions (presented in TG full session)
 - [11-19-0099](#), "11ax D4.0 sounding comments," Huizhao Wang (Quantenna Communications)
 - [11-19-0619](#), "Proposed Resolutions to select comments on D4.0," Mark Rison (Samsung)
 - [11-19-0863](#), "11ax D4.0 sounding comments," Menzo Wentink (Qualcomm)
 - [11-19-0876](#), "Updated Channelization for 6 GHz," Imran Latif (Quantenna Communications)
 - [11-19-0909](#), "Comment resolutions for 6 ghz scanning," Alfred Asterjadhi (Qualcomm)
 - [11-19-0912](#), "Editorial changes to approved resolutions," Robert Stacey (Intel)
 - [11-19-1017](#), "D4.0 CR for 6GHz channelization," Ruchen Duan (Samsung)
 - [11-19-1122](#), "11ax D4.2 Padding for Random Access," Po-Kai Huang (Intel)
 - [11-19-1123](#), "Editorial Comments on TGax/D4.0," Po-Kai Huang/Robert Stacey (Intel)
 - [11-19-1183](#), "Comment Resolution on Trigger Frame Format," Lochan Verma (Qualcomm)
 - [11-19-1199](#), "Updated Channelization for 6 GHz," Imran Latif (Quantenna Communications)

3. Timeline

No discussion on the timeline during the week.

Here is the current timeline.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
January 2019	Draft 4.0 and Recirculation Ballot — Passes (92.2%)
May 2019	Mandatory Draft Review
June 2019	Formation of Sponsor Ballot pool
August 2019	Initial Sponsor Ballot
January 2020	Final 802.11 Approval
March 2020	Conditional EC Approval
June 2020	RevCom submittal and publication

Goals for the September 2019 session

- Complete the comment resolution on draft D4.0.
- Instruct the TG Editor to prepare draft D5.0 and start a new WG Recirculation ballot.
- Approve the new revision of the TG Coexistence Assurance document.

Teleconferences

Following TGax teleconferences were authorized during the July 2019 session.

Thursday	August 1 st , 2019	10:30 - 13:30 (ET)
Thursday	August 8 th , 2019	19:00 - 22:30 (ET)
Thursday	August 15 th , 2019	10:30 - 13:30 (ET)
Thursday	August 22 nd , 2019	19:00 - 22:30 (ET)
Thursday	August 29 th , 2019	10:30 - 13:30 (ET)
Thursday	September 5 th , 2019	19:00 - 22:30 (ET)

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May 2019 — Atlanta, GA

TGax had eight meeting slots during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1				TGax (full session)
AM2	TGax (full session)	TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full session)	TGax (full session)
PM2			TGax (PHY ad hoc) TGax (MAC ad hoc)	
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-19-0615-06](#), TGax May 2019 Meeting Agenda
 - [11-19-0925-00](#), TGax May 2019 Closing Report
 - [11-19-0872-00](#), TGax May 2019 Atlanta Meeting Minutes
- TGax PHY ad hoc
 - [11-19-0880-01](#), TGax Mar 2019 Meeting Agenda - PHY Adhoc
 - 11-19-0xxx-00, Draft TGax PHY Ad Hoc May 2019 Meeting Minutes (not available)
- TGax MAC ad hoc
 - [11-19-0881-03](#), TGax MAC Adhoc May 2019 Meeting Agenda
 - [11-19-0918-00](#), TGax MAC Ad-hoc meeting minutes May 2019

Achievements

1. Work Completed

- The TG completed the resolution of about 430 comments.
- The TG passed a motion to have an ad-hoc meeting in Rennes, France hosted by Cannon during the period July 10-12.
- Discussed the TG timeline and made few adjustments.

2. Technical Submissions

TGax received following submissions.

- PHY submissions
 - [11-18-1774](#), "Resolution to CID 16624 (HESIGB)," Brian Hart (Cisco Systems)
 - [11-19-0378](#), "D4.0 CID20395 Unused Tone EVM," Youhan Kim (Qualcomm)
 - [11-19-0379](#), "D4.0 Comment Resolution - Part 1," Youhan Kim (Qualcomm)
 - [11-19-0385](#), "Resolution for CIDs in 27.1.1," Sameer Vermani (Qualcomm)
 - [11-19-0386](#), "CR Disallowed Subchannels," Ron Porat (Broadcom)
 - [11-19-0407](#), "Comment Resolutions PHY xVECTORS," Bo Sun (ZTE)
 - [11-19-0422](#), "CR for CID 21497, 21501, 21502," Xiaogang Chen (Intel)
 - [11-19-0553](#), "Comment Resolutions on Clause 27.3.15.2 (Beamforming feedback matrix V)," Kome Oteri (InterDigital)
 - [11-19-0793](#), "Remaining PHY Math comment resolutions," Yan Zhang (Marvell)
 - [11-19-0826](#), "CR on DCM and STBC Combinations," Youhan Kim (Qualcomm)
 - [11-19-0827](#), "CR on Punctured Non-HT Duplicate PPDU," Youhan Kim (Qualcomm)
 - [11-19-0830](#), "CR on Clause 17," Youhan Kim (Qualcomm)

- [11-19-0831](#), "D4.0 Comment Resolution - Part 2," Youhan Kim (Qualcomm)
- [11-19-0836](#), "D4.0 Comment Resolution - Part 3," Youhan Kim (Qualcomm)
- [11-19-0837](#), "CR on HE Capabilities," Youhan Kim (Qualcomm)
- [11-19-0858](#), "PHY CR in Clause 10," Youhan Kim (Qualcomm)
- [11-19-0866](#), "CR for Misc.," Xiangang Chaen (Intel)
- MAC submissions
 - [11-18-0218](#), "Fragment Flush BlockAckReq," Matthew Fischer (Broadcom)
 - [11-18-1822](#), "Temporarily Limited Connection," Matthew Fischer (Broadcom)
 - [11-19-0288](#), "CR for HE Beacon," Po-Kai Huang (Intel)
 - [11-19-0292](#), "Comments on TGax D4.0," Po-Kai Huang (Intel)
 - [11-19-0301](#), "Comment resolutions for HE beacon in 6 Ghz band," Alfred Asterjadhi (Qualcomm)
 - [11-19-0302](#), "Comment resolutions for HE BSS operation," Alfred Asterjadhi (Qualcomm)
 - [11-19-0303](#), "Comment Resolution for QoS Control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0304](#), "Comment resolutions for HE BSS operation in 6 GHz," Alfred Asterjadhi (Qualcomm)
 - [11-19-0305](#), "Comment resolutions for transmit power control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0309](#), "Comment resolutions for Frame Control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0315](#), "Comment resolutions for TWT power save," Alfred Asterjadhi (Qualcomm)
 - [11-19-0316](#), "Comment resolutions for BSR operation," Alfred Asterjadhi (Qualcomm)
 - [11-19-0325](#), "11ax D4.0 MAC Comment Resolution for SM Power Save," Po-Kai Huang (Intel)
 - [11-19-0339](#), "11ax D4.0 MAC Comment Resolution for Co-hosted BSSID," Po-Kai Huang (Intel)
 - [11-19-0394](#), "Resolution for CIDs in 9.3.1.22," Abhishek Patil (Qualcomm)
 - [11-19-0395](#), "Resolution for CIDs related to BSS Color - Part 1," Abhishek Patil (Qualcomm)
 - [11-19-0413](#), "CR for MU EDCA," Laurent Cariou (Intel)
 - [11-19-0414](#), "CR for NFRP," Laurent Cariou (Intel)
 - [11-19-0415](#), "CR for OPS," Laurent Cariou (Intel)
 - [11-19-0417](#), "CR for 6 GHz out of band," Laurent Cariou (Intel)
 - [11-19-0427](#), "Comment resolution on CID 20175," Zhou Lan (Broadcom)
 - [11-19-0436](#), "Resolution for CIDs in clause 11.1.4," Abhishek Patil (Qualcomm)
 - [11-19-0447](#), "Resolutions to CID 20256, 20257," Jarkko Knecht (Apple)
 - [11-19-0479](#), "Resolution for CID 20012," Abhishek Patil (Qualcomm)
 - [11-19-0488](#), "CR for Reduced Neighbor Report," Jarkko Knecht (Apple)
 - [11-19-0492](#), "11ax D4.0 MAC Comment Resolution for MU-RTS/CTS," Po-Kai Huang (Intel)
 - [11-19-0494](#), "Resolution for CID 20346 related to BSS Color," Kaiying Lu (ZTE)
 - [11-19-0505](#), "Resolution for CIDs related to BSS Color - Part 2," Abhishek Patil (Qualcomm)
 - [11-19-0506](#), "Resolution for CIDs related to Multiple BSSID," Abhishek Patil (Qualcomm)
 - [11-19-0508](#), "Resolution for CIDs related to UORA," Abhishek Patil (Qualcomm)
 - [11-19-0510](#), "Resolution for CIDs related to MU Operation," Abhishek Patil (Qualcomm)
 - [11-19-0548](#), "Resolution for CIDs related to TF format (9.3.1.22) - Part 2," Abhishek Patil (Qualcomm)
 - [11-19-0561](#), "Comment resolutions for miscellaneous TWT," Alfred Asterjadhi (Qualcomm)
 - [11-19-0593](#), "Comment resolutions for Frame Control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0594](#), "Comment resolutions for transmit power control - part 2," Alfred Asterjadhi (Qualcomm)
 - [11-19-0604](#), "11ax D4.1 MAC Comment Resolution for NAV part I," Po-Kai Huang (Intel)
 - [11-19-0605](#), "11ax D4.0 MAC Comment Resolution for MU-RTS part II," Po-Kai Huang (Intel)
 - [11-19-0652](#), "Comment resolutions for TWT Information frames," Alfred Asterjadhi (Qualcomm)
 - [11-19-0696](#), "OMI Comment Resolutions," Jarkko Kineckt (Apple)
 - [11-19-0703](#), "11ax D4.0 comment and resolution for Trigger frame MAC padding," Tianyu Wu (Apple)
 - [11-19-0724](#), "Comment resolutions for broadcast TWT," Alfred Asterjadhi (Qualcomm)
 - [11-19-0725](#), "Comment resolutions for Individual TWT," Alfred Asterjadhi (Qualcomm)
 - [11-19-0734](#), "11ax D4.0 Comment Resolution 9.7.3," Liwen Chu (Marvell)

- [11-19-0735](#), "11ax D4.0 Comment Resolution 10.24," Liwen Chu (Marvell)
- [11-19-0737](#), "11ax D4.0 comment-resolution 9.2.4.6, 9.4.2.242.2," Liwen Chu (Marvell)
- [11-19-0745](#), "MAC CR for subclause 9.4.2," Ming Gan (Huawei)
- [11-19-0748](#), "11ax D4.0 Comment Resolution 26.2.8," Liwen Chu (Marvell)
- [11-19-0750](#), "11ax D4.0 comment-resolution 26.5.3.4," Liwen Chu (Marvell)
- [11-19-0751](#), "Figure 26-3a," Abhishek Patil (Qualcomm)
- [11-19-0753](#), "11ax D4.1 MAC Multiple BSSID Minor Bug Fix," Po-Kai Huang (Intel)
- [11-19-0756](#), "Ack related CRs on Section 26.4," George Cherian (Qualcomm)
- [11-19-0765](#), "CR MU EDCA Timer," Zhou Lan (Broadcom)
- [11-19-0769](#), "CR for NFRP," Laurent Cariou (Intel)
- [11-19-0770](#), "LB238 CR PPDU format, BW, MCS, NSS, and DCM selection," Yongho Seok (MediaTek)
- [11-19-0785](#), "MAC CR Comment Resolution," Ming Gan (Huawei)
- [11-19-0795](#), "Visio file for (updated) Figure 26-5," Abhishek Patil (Qualcomm)
- [11-19-0816](#), "Resolutions to comments to subclause 9.3.1.8," Tomoko Adachi (Toshiba)
- [11-19-0835](#), "Comment resolution for subclause 26.2.2," Kaiying Lu (ZTE)
- SR submissions
 - [11-19-0416](#), "CR for Spatial reuse," Laurent Cariou (Intel)
 - [11-19-0613](#), "SRP Comments," Matthew Fischer (Broadcom)

3. Timeline

A little adjustments to the current timeline are made.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
Janury 2019	Draft 4.0 and Recirculation Ballot — Passes (92.2%)
May 2019	Mandatory Draft Review
June 2019	Formation of Sponsor Ballot pool
August 2019	Initial Sponsor Ballot
January 2020	Final 802.11 Approval
March 2020	Conditional EC Approval
June 2020	RevCom submittal and publication

Goals for the July 2019 session

- Complete the comment resolution on draft D4.0.
- Instruct the TG Editor to prepare draft D5.0 and start a new WG Recirculation ballot.

Teleconferences

Following TGax teleconferences were authorized during the March 2019 session.

Thursday	May 23 rd , 2019 (approved during the March 2019 meeting)	10:00 - 12:00 (ET)
Thursday	May 30 th , 2019	20:00 - 22:00 (ET)
Thursday	June 13 th , 2019	10:00 - 12:00 (ET)
Thursday	June 20 st , 2019	20:00 - 22:00 (ET)
Thursday	June 27 th , 2019	10:00 - 12:00 (ET)

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March 2019 — Vancouver, BC, Canada

TGax had seven meeting slots during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1				TGax (full session)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (full session)		TGax (full session)	TGax (full session)
PM2		TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-19-0238-05](#), TGax March 2019 Meeting Agenda
 - [11-19-0521-00](#), TGax March 2019 Closing Report
 - [11-19-0428-00](#), TGax March 2019 Vancouver Meeting Minutes
- TGax PHY ad hoc
 - [11-19-0457-02](#), TGax Mar 2019 Meeting Agenda - PHY Adhoc
 - [11-19-0462-00](#), TGax March 2019 Vancouver PHY Ad Hoc Meeting Minutes
- TGax MAC ad hoc
 - [11-19-0453-02](#), TGax MAC Adhoc March 2019 Meeting Agenda
 - [11-19-0501-00](#), TGax MAC Ad-hoc meeting minutes March 2019

Achievements

1. Work Completed

- The TG completed the resolution of about 200 comments.
- Completed the assignment of almost all the CIDs.
- The TG passed a motion to have an adhoc meeting in San Diego during the period May 8-10.

2. Technical Submissions

TGax received following submissions.

- PHY submissions
 - [11-18-1774](#), "Resolution to HESIGB-related CIDs," Brian Hart (Cisco Systems)
 - [11-19-0378](#), "D4.0 CID20395 - Unused Tone EVM," Youhan Kim (Qualcomm)
 - [11-19-0379](#), "D4.0 PHY Comment Resolution - Part 1," Youhan Kim (Qualcomm)
 - [11-19-0385](#), "Resolution for CIDs in 27.1.1," Sameer Vermani (Qualcomm)
 - [11-19-0386](#), "Disallowed Subchannels Comment Resolution," Ron Porat (Broadcom)
 - [11-19-0407](#), "Comment Resolutions for xVECTORS," Bo Sun (ZTE)
 - [11-19-0422](#), "CR for CID 21497, 21501, 21502," Xiaogang Chen (Intel)
- MAC submissions
 - [11-18-0218](#), "Fragment Flushing BlockAckReq," Matthew Fischer (Broadcom Ltd.)
 - [11-18-1822](#), "Temporary Limited Connection," Matthew Fischer (Broadcom Ltd.)
 - [11-19-0301](#), "Comment resolutions for HE beacon in 6 Ghz band," Alfred Asterjadhi (Qualcomm)
 - [11-19-0302](#), "Comment resolutions for HE BSS operation," Alfred Asterjadhi (Qualcomm)
 - [11-19-0303](#), "Comment resolutions for QoS Control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0305](#), "Comment resolutions for transmit power control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0309](#), "Comment resolutions for Frame Control," Alfred Asterjadhi (Qualcomm)
 - [11-19-0315](#), "Comment resolutions for TWT power save," Alfred Asterjadhi (Qualcomm)
 - [11-19-0316](#), "Comment resolutions for BSR operation," Alfred Asterjadhi (Qualcomm)
 - [11-19-0325](#), "11ax D4.0 MAC Comment Resolution for SM Power Save," Po-Kai Huang (Intel)
 - [11-19-0339](#), "11ax D4.0 MAC Comment Resolution for Co-hosted BSSID," Po-Kai Huang (Intel)
 - [11-19-0394](#), "Resolution for CIDs in 9.3.1.22," Abhishek Patil (Qualcomm)
 - [11-19-0395](#), "Resolution for CIDs related to BSS Color - Part 1," Abhishek Patil (Qualcomm)
 - [11-19-0413](#), "CR for MU EDCA parameters," Laurent Cariou (Intel)
 - [11-19-0414](#), "CR for NFRP," Laurent Cariou (Intel)
 - [11-19-0416](#), "CR for Spatial reuse," Laurent Cariou (Intel)
 - [11-19-0427](#), "Comment resolution on CID 20175," Zhou Lan (Broadcom Ltd.)
 - [11-19-0436](#), "Resolution for CIDs in clause 11.1.4," Abhishek Patil (Qualcomm)

3. Timeline

No change to current timeline.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
January 2019	Draft 4.0 and Recirculation Ballot — Passes (92.2%)
February 2019	Formation of Sponsor Ballot pool

March 2019	Mandatory Draft Review
July 2019	Initial Sponsor Ballot
January 2020	Final 802.11 Approval
March 2020	Conditional EC Approval
June 2020	RevCom submittal and publication

Goals for the May 2019 session

- Continue the comment resolution on draft D4.0.

Teleconferences

Following TGax teleconferences were authorized during the March 2019 session.

Thursday	March 29 th , 2019	10:00 - 12:00 (ET)
Thursday	April 11 th , 2019	10:00 - 12:00 (ET)
Thursday	April 25 th , 2019	10:00 - 12:00 (ET)
Thursday	May 21 st , 2019	10:00 - 12:00 (ET)

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January 2019 — St. Louis, MO

TGax planed ten sessions during the week.

During WG mid-week plenary session, one more session was added on Thursday PM2.

	Monday	Tuesday	Wednesday	Thursday
AM1		TGax (full session)	TGax (full session)	TGax (full session)
AM2	TGax (full session)	TGax (full session)		
PM1	TGax (full session)		TGax (full session)	TGax (full session)
PM2		TGax (full session)		TGax (full session)
PM3	TGax (full session)	TGax (full session)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-18-2114-10](#), TGax January 2019 Meeting Agenda

- [11-19-0208-00](#), TGax January 2019 Closing Report
- [11-19-0126-00](#), Draft TGax January 2019 St. Louis Meeting Minutes

Achievements

1. Work Completed

- The TG completed the resolution of all comments submitted on draft D3.0.
- The TG passed a motion to allow the Editor to prepare draft D4.0 and start a 15 day WG Ballot.
- The TG approved a new revision of the Coexistence Assurance document.
- TGax Timeline was adjusted.

2. Technical Submissions

TGax received following submissions during the TGax sessions.

- [11-18-0218](#), "Fragment Flushing BlockAckReq," Matthew Fischer (Broadcom Ltd.)
- [11-18-1211](#), "Comment resolutions for 27.16.1 related to 6 GHz band," Alfred Asterjadhi (Qualcomm)
- [11-18-1227](#), "CR for 6GHz - Discovery," Laurent Cariou (Intel)
- [11-18-1471](#), "Comment resolutions for 27.16.1 related to 6 GHz band," Alfred Asterjadhi (Qualcomm)
- [11-18-1472](#), "Comment resolutions for 27.7.4," Alfred Asrterjadhi (Qualcomm)
- [11-18-1489](#), "Operation at 6GHz Band," Liwen Chu (Marvell Semiconductor)
- [11-18-1506](#), "LB233 CR ER Beacon," Yongho Seok (MediaTek)
- [11-18-1697](#), "MAC CR 27.7.3," Alfred Asterjadhi (Qualcomm)
- [11-18-1779](#), "LB233 CR Transmit Power Control," Yongho Seok (MediaTek)
- [11-18-1807](#), "Resolutions for Miscellaneous CIDs," Yasuhiko Inoue (NTT)
- [11-18-1821](#), "Maximum RX PPDU Duration Signaling," Matthew Fischer (Broadcom Ltd.)
- [11-18-1822](#), "TLC Signaling," Matthew Fischer (Broadcom Ltd.)
- [11-18-1827](#), "6 GHz operation for 11ax follow up," Wookbong Lee (Samsung)
- [11-18-1831](#), "Comment resolution to CIDs 15990, 17031 and 17033," Jarkko Knecht (Apple)
- [11-18-1853](#), "Resolutions to comments to subclauses 10.3.7, 3.1, 3.2, and 27.5.1.1," Tomoko Adachi (Toshiba)
- [11-18-1855](#), "Comment Resolution for 27.16.4," Chao-Chun Wang (MediaTek)
- [11-18-1859](#), "11ax D3.0 Comment Resolution 27.10.4," Liwen Chu (Marvell Semiconductor)
- [11-18-1866](#), "CR for OBSS_PD," Laurent Cariou (Intel)
- [11-18-1887](#), "11ax D3.2 MAC Comment Resolution for Section 27.5," Zhou Lan (Broadcom Ltd.)
- [11-18-1932](#), "Proposed Resolutions to Miscs PHY and MAC CIDs," Peter Loc (Huawei Technologies)
- [11-18-1987](#), "D3.0 Comment Resolution on MAC Miscellaneous," Jae Seung Lee (ETRI)
- [11-18-1995](#), "Resolution for CIDs: 15302, 15906, 16750," Huizhao Wang (Quantenna Communications)
- [11-18-1999](#), "RTS CTS protection coverage," Jarkko Knecht (Apple)
- [11-18-2033](#), "Changes to D3.3," Xiaogang Chen (Intel)
- [11-18-2040](#), "11ax D3.0 Comment Resolution miscellaneous," Liwen Chu (Marvell Semiconductor)
- [11-18-2085](#), "11ax D3.0 MAC Comment Resolution for Capability of MU Transmission and Reception," Po-Kai Huang (Intel)
- [11-19-0002](#), "HE beamforming feedback subcarriers," Mark Rison (Samsung)
- [11-19-0006](#), "CR Default UORA Parameters," Matthew Fischer (Broadcom Ltd.)
- [11-19-0028](#), "Multiple BSSID Clarification - Part 3," Abhishek Patil (Qualcomm)
- [11-19-0041](#), "TWT Capability Support Signaling," Matthew Fischer (Broadcom Ltd.)
- [11-19-0061](#), "CR for 6GHz - Active Scanning Part I," Jarkko Knecht (Apple)
- [11-19-0076](#), "LB233 CR on CID 16486 17140 and 16449," Ming Gan (Huawei Technologies)
- [11-19-0085](#), "LB233 CR MAC Miscellaneous Part 2," Yongho Seok (MediaTek)
- [11-19-0095](#), "CR for 6GHz - Active Scanning Part II," Jarkko Knecht (Apple)
- [11-19-0096](#), "Comment resolutions for TWT fixes," Alfred Asterjadhi (Qualcomm)
- [11-19-0097](#), "Comment resolutions for HE SU beacon and miscellaneous rules for 6 GHz," Alfred Asterjadhi (Qualcomm)

- [11-19-0098](#), "11ax D3.0 Comment Resolution miscellaneous," Liwen Chu (Marvell Semiconductor)
- [11-19-0099](#), "11ax D3.0 sounding comments," Huizhao Wang (Quantenna Communications)
- [11-19-0117](#), "Changes to D3.3 (Power Deboosting Pre HE)," Xiaogang Chen (Intel)
- [11-19-0120](#), "CR for CID 15153," Guoqing Li (Apple)
- [11-19-0121](#), "Proposed Spec Text change on Trigger Frame MAC padding," Tianyu Wu (Samsung)
- [11-19-0140](#), "CR misc MAC," Matthew Fischer (Broadcom Ltd.)
- [11-19-0148](#), "CR for CID 17129," Yunbo Li (Huawei Technologies)
- [11-19-0160](#), "11ax D3.0 MAC Comment Resolution for Co-hosted BSS," Po-Kai Huang (Intel)
- [11-19-0161](#), "CR misc MAC - CID 16535," Sean Coffey (RealTek)
- [11-19-0162](#), "11ax D3.0 MAC MU-CTS Clarification," Po-Kai Huang (Intel)
- [11-19-0166](#), "11ax D3.0 MAC Comment Resolution for Bandwidth Queue Report," Zhou Lan (Broadcom Ltd.)
- [11-19-0170](#), "Remaining Ack related CRs," George Cherian (Qualcomm)
- [11-19-0177](#), "CR for OPS," Laurent Cariou (Intel)
- [11-19-0180](#), "FTM in 6 GHz," Alfred Asterjadhi (Qualcomm)
- [11-19-0184](#), "CID 16444 and 15178 discussion -- Why 11ax should maintain current data channel access rules on 6GHz," Guoqing Li (Apple)
- [11-19-0192](#), "Comment resolutions for last CIDs," Alfred Asterjadhi (Qualcomm)
- [11-19-0194](#), "Clarification of HE TB PPDU timing requirements," Mark Rison (Samsung)

3. Timeline update

Current timeline has been updated as follow.

Current Timeline (Updated)	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
Janury 2019	Draft 4.0 and Recirculation Ballot
February 2019	Formation of Sponsor Ballot pool
March 2019	Mandatory Draft Review
July 2019	Initial Sponsor Ballot
January 2020	Final 802.11 Approval
March 2020	Conditional EC Approval
June 2020	RevCom submittal and publication

Goals for the March 2019 session

- Start comment resolution on draft D4.0.

Teleconferences

TGax teleconferences will be scheduled with a 10-day notice.

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November 2018 — Bangkok, Thailand

TGax planed ten sessions during the week.

During WG mid-week plenary session, one more session was added in Thursday PM2.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full ad hoc session)	TGax (MAC ad hoc)	TGax (full session)	TGax (full session)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full session)
PM1			TGax (PHY ad hoc) TGax (MAC ad hoc)	
PM2	TGax (full)	TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full session)
PM3		TGax (MAC ad hoc)		

Submissions for MU and SR ad hoc groups were considered in the MAC ad hoc group.

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-18-1517-08](#), TGax November 2018 Meeting Agenda
 - [11-18-2061-00](#), TGax November 2018 Closing Report
 - [11-18-1933-00](#), TGax November 2018 Bangkok Meeting Minutes
 - PHY ad hoc
 - [11-18-1997-02](#), TGax Nov 2018 Meeting Agenda - PHY Adhoc
 - [11-18-2024-00](#), IEEE 802.11 TGax November 2018 Bangkok PHY Ad Hoc Meeting Minutes
 - MAC ad hoc
 - [11-18-2006-02](#), TGax November 2018 MAC ad hoc Meeting Agenda
 - [11-18-2008-00](#), Minutes of TGax MAC ad hoc meeting November 2018 in Bangkok

Achievements

1. Work Completed

- The TG approved resolutions to 500+ technical comments
- The TG needs more time to complete resolutions of the rest of the comments ~ 250 to 300 CIDs are left
- The TG plans to complete the comment resolution in January 2019

2. Technical Submissions

TGax received following submissions during the TGax sessions.

- PHY Submissions

- [11-18-1492](#), "Remaining PHY Math comment resolutions," Yan Zhang (Marvell Semiconductor)
- [11-18-1534](#), "CR for PPDU formats," Tianyu Wu (Samsung)
- [11-18-1734](#), "PHY subcarriers and RU part 2," Yujin Noh (Newracom)
- [11-18-1735](#), "CR on PHY Intro," Yujin Noh (Newracom)
- [11-18-1759](#), "Comment Resolutions for xVECTORS," Bo Sun (ZTE)
- [11-18-1764](#), "CR on HE-SIG-A and HE-SIG-B - Part 6," Ross Jian Yu (Huawei Technologies)
- [11-18-1774](#), "Resolution to CID 16624 (HE-SIG-B)," Brian Hart (Cisco Systems)
- [11-18-1790](#), "CR on PHY Miscellaneous," Yujin Noh (Newracom)
- [11-18-1832](#), "D3.0 Comment Resolution on CID for 28.4.3," Jianhan Liu (MediaTek)
- [11-18-1841](#), "Comment Resolution on PHY Introduction," Bin Tian (Qualcomm)
- [11-18-1842](#), "Comment Resolution on PHY Miscellaneous," Bin Tian (Qualcomm)
- [11-18-1848](#), "CID 17100," Youhan Kim (Qualcomm)
- [11-18-1849](#), "D3.0 Comment Resolution Part 3," Youhan Kim (Qualcomm)
- [11-18-1850](#), "D3.0 Comment Resolution Part 4," Youhan Kim (Qualcomm)
- [11-18-1891](#), "Discussions on Trigger Frame MAC Padding," Hongyuan Zhang (Marvell Semiconductor)
- [11-18-1906](#), "Comment Resolution on Trigger Frame MAC Padding," Hongyuan Zhang (Marvell Semiconductor)
- [11-18-1907](#), "Comment Resolution of MU-CTS Scrambling," Hongyuan Zhang (Marvell Semiconductor)
- [11-18-1980](#), "D3.0 CR for PHY Misc," Tianyu Wu (Samsung)
- [11-18-2007](#), "Changes to D3.0," Xiaogang Chen (Intel)
- [11-18-2017](#), "PHY Remaining CSD," Bin Tian (Qualcomm)
- [11-18-2019](#), "Resolution for SIG_B_Compression_Mode definition in TxVector," Jerome Vanthournout (CEVA-DSP)
- [11-18-2023](#), "Comment Resolution on CID 16768," Jianhan Liu (MediaTek)

o MAC Submissions

- [11-18-0218](#), "Fragment Flushing BlockAckReq," Matthew Fischer (Broadcom Ltd.)
- [11-18-1432](#), "Doze Transition Signaling," Matthew Fischer (Broadcom Ltd.)
- [11-18-1454](#), "Figure 27-12," Abhishek Patil (Qualcomm)
- [11-18-1471](#), "Comment resolutions for 27.16.1 related to 6 Ghz band," Alfred Asterjadhi (Qualcomm)
- [11-18-1472](#), "Comment resolutions for 27.7.4," Alfred Asterjadhi (Qualcomm)
- [11-18-1473](#), "Comment resolutions for miscellaneous CIDs - Part 1," Alfred Asterjadhi (Qualcomm)
- [11-18-1474](#), "Comment resolutions for 27.7.2," Alfred Asterjadhi (Qualcomm)
- [11-18-1487](#), "11ax D3.0 Comment Resolution 27.5.3.2.3," Liwen Chu (Marvell Semiconductor)
- [11-18-1498](#), "CR for 27.5.6," Laurent Cariou (Intel)
- [11-18-1505](#), "LB233 CR MAC TXVECTOR," Yongho Seok (MediaTek)
- [11-18-1506](#), "LB233 CR ER Beacon," Yongho Seok (MediaTek)
- [11-18-1507](#), "11ax D3.0 MAC Comment Resolution for Co-located BSS," Po-Kai Huang (Intel)
- [11-18-1508](#), "11ax D3.0 MAC Comment Resolution for Multiple BSSID," Po-Kai Huang (Intel)
- [11-18-1519](#), "11ax D3.0 MAC Comment Resolution for Control response," Robert Stacey (Intel)
- [11-18-1696](#), "Comment resolutions for 9.6.25," Alfred Asterjadhi (Qualcomm)
- [11-18-1697](#), "Comment resolutions for 27.7.3," Alfred Asterjadhi (Qualcomm)
- [11-18-1698](#), "Comment resolutions for miscellaneous CIDs part 2," Alfred Asterjadhi (Qualcomm)
- [11-18-1699](#), "Comment resolutions for subclause 9.2.4," Alfred Asterjadhi (Qualcomm)
- [11-18-1703](#), "Resolution to CID 17150," Tomoko Adachi (Toshiba)
- [11-18-1733](#), "CID 16364 on Packet Extension," Yujin Noh (Newracom)
- [11-18-1775](#), "Comment resolutions for miscellaneous - Part 3," Alfred Asterjadhi (Qualcomm)
- [11-18-1777](#), "Ack-related CIDs remaining," George Cherian (Qualcomm)
- [11-18-1778](#), "LB233 CR subclause 27.15.2 and 27.15.3," Yongho Seok (MediaTek)
- [11-18-1779](#), "LB233 CR Transmit Power Control," Yongho Seok (MediaTek)
- [11-18-1780](#), "LB233 CR MAC Miscellaneous," Yongho Seok (MediaTek)
- [11-18-1799](#), "CR for 16668," Po-Kai Huang (Intel)

- [11-18-1800](#), "CR for Miscellaneous CIDs," Po-Kai Huang (Intel)
- [11-18-1807](#), "Proposed Resolutions for Miscellaneous CIDs," Yasuhiko Inoue (NTT)
- [11-18-1808](#), "Proposed Resolutions for CIDs related to HE MAC Capabilities," Yasuhiko Inoue (NTT)
- [11-18-1812](#), "Resolution for CIDs related to Random Access," Abhishek Patil (Qualcomm)
- [11-18-1814](#), "Resolution for CIDs related to Multiple BSSID - Part 2," Abhishek Patil (Qualcomm)
- [11-18-1815](#), "Resolution for miscellaneous CIDs," Abhishek Patil (Qualcomm)
- [11-18-1817](#), "Figure 9-63j1," Abhishek Patil (Qualcomm)
- [11-18-1820](#), "Doze Transition Signaling MoreData," Matthew Fischer (Broadcom Ltd.)
- [11-18-1821](#), "Maximum RX PPDU Duration Signaling," Matthew Fischer (Broadcom Ltd.)
- [11-18-1822](#), "Temporarily Limited Connection," Matthew Fischer (Broadcom Ltd.)
- [11-18-1830](#), "CR for TSPEC," Jarkko Knecht (Apple)
- [11-18-1831](#), "OMI comment resolution," Jarkko Knecht (Apple)
- [11-18-1844](#), "LB233 CR on Fragmentation," Ming Gan (Huawei Technologies)
- [11-18-1851](#), "Resolutions to comments to subclause 9.3.1.9," Tomoko Adachi (Toshiba)
- [11-18-1852](#), "General and Annex G Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
- [11-18-1853](#), "Resolutions to comments to subclauses 10.3.7, 3.1, 3.2, and 27.5.1.1," Tomoko Adachi (Toshiba)
- [11-18-1855](#), "Comments Resolution - 27.16.4," Chao-Chun Wang (MediaTek)
- [11-18-1856](#), "11ax D3.0 Comment Resolution 9.7.1," Liwen Chu (Marvell)
- [11-18-1857](#), "11ax D3.0 Comment Resolution 27.10.1 27.10.3" Liwen Chu (Marvell)
- [11-18-1858](#), "11ax D3.0 Comment Resolution 9.7.3," Liwen Chu (Marvell)
- [11-18-1859](#), "11ax D3.0 Comment Resolution 27.10.4," Liwen Chu (Marvell)
- [11-18-1867](#), "CR for OPS 2," Laurent Cariou (Intel)
- [11-18-1868](#), "CR for Clause 4," Guoqing Li (Apple)
- [11-18-1876](#), "Resolutions to Miscellaneous MAC Comments," Osama Aboul-Magd (HuaweiTechnoloies)
- [11-18-1887](#), "11ax D3.2 MAC Comment Resolution for Section 27.5," Zhou Lan (Broadcom Ltd.)
- [11-18-1900](#), "11ax D3.2 MAC Comment Resolution for Section 27.7.7," Zhou Lan (Broadcom Ltd.)
- [11-18-1901](#), "D3.0 Comment Resolution - Part 5," Youhan Kim (Qualcomm)
- [11-18-1921](#), "11ax D3.0 sounding comments," Menzo Wentink (Qualcomm)
- [11-18-1932](#), "Proposed Resolutions to Miscs PHY and MAC CIDs," Peter Loc (Huawei Technologies)
- [11-18-1935](#), "Resolutions to CIDs 15935 and 16150," Osama Aboul-Magd (Huawei Technologies)
- [11-18-1939](#), "Comment resolution on MIBs - part 1," Edward Au (Huawei Technologies)
- [11-18-1942](#), "Comment resolution on PICs," Edward Au (Huawei Technologies)
- [11-18-1944](#), "Comment resolution on MIBs - part 2," Edward Au (Huawei Technologies)
- [11-18-1958](#), "CR for CID 16643," Yunbo Li (Huawei Technologies)
- [11-18-1969](#), "Proposed resolution for CIDs for 27-2-2-Part 2," Kaiying Lv (ZTE)
- [11-18-1975](#), "11ax D3.0 Comment Resolution 27.5.3.4," Liwen Chu (Marvell Semiconductor)
- [11-18-1987](#), "D3.0 Comment Resolution on MAC Miscellaneous," Jae Seung Li (ETRI)
- [11-18-1995](#), "Resolution for CIDs: 15302, 15906, 16750," Huizhao Wang (Quantenna)
- [11-18-1999](#), "RTS CTS protection coverage," Jarkko Knecht (Apple)
- MU Submissions
 - [11-18-1803](#), "CR on MU-RTS/CTS part II," Po-Kai Huang (Intel)
 - [11-18-1812](#), "Resolution for CIDs related to Random Access - Part 2," Abhishek Patil (Qualcomm)
- SR Submission
 - [11-18-1531](#), "Spatial Reuse DSC and TPC," Graham Smith (SR Technologies)
 - [11-18-1866](#), "CR for OBSS_PD 2," Laurent Cariou (Intel)
- TG submissions
 - [11-18-0496](#), "Disallowed Sub-Channels," Matthew Fischer (Broadcom Ltd.)
 - [11-18-1489](#), "Operation at 6GHz Band," Liwen Chu (Marvell Semiconductor)
 - [11-18-1500](#), "CR for 6 GHz - 6 GHz Map," Laurent Cariou (Intel)

- [11-18-1532](#), "TGax Coexistence Assurance Document Comments," Eldad Perahia (HP Enterprize)
- [11-18-1827](#), "6 GHz operation for 11ax follow up," Wook Bong Lee (Samsing)
- [11-18-1828](#), "D3.0 CR for 6GHz Post Association," Wook Bong Lee (Samsing)
- [11-18-1922](#), "Considerations on 6 GHz Discovery," Thomas Derham (Broadcom Ltd.)
- [11-18-1959](#), "CR for 6GHz - Out-of-band association," Lauernt Cariou (Intel)
- [11-18-1960](#), "6 GHz - Out-of-band discovery discussion," Laurent Cariou (Intel)
- [11-18-1961](#), "6 GHz association discussion," Laurent Cariou (Intel)

3. Timeline update

Current timeline needs to be updated. Details will be discussed in the January 2019 session.

Current Timeline (to be updated)	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
November 2018	Mandatory Draft Review
November 2018	Draft 4.0 and Recirculation Ballot
February 2019	Formation of Sponsor Ballot pool
March 2019	Draft 5.0 and Recirculation (unchanged)
July 2019	Initial Sponsor Ballot
January 2020	RevCom submittal and publication

Goals for the January 2019 session

- Complete the resolution of comments received on draft D3.0, generate draft D4.0, and go to recirculation ballot.

Teleconferences

Following TGax teleconferences were authorized during the September 2018 session.

Thursday	November 29 th , 2018	18:00 - 20:00 (ET)
Thursday	December 06 th , 2018	10:00 - 12:00 (ET)
Thursday	December 13 th , 2018	18:00 - 20:00 (ET)
Thursday	December 20 th , 2018	10:00 - 12:00 (ET)
Thursday	January 03 rd , 2019	10:00 - 12:00 (ET)

Additional TGax teleconference may be scheduled with 10-day notice if needed.

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September 2018 — Waikoloa, HI

TGax had ten sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1		TGax (full) 6 GHz discussion	TGax (full) 6 GHz discussion	TGax (full)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (full)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full) COEX discussion with 802.19
PM2		TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)	
PM3	TGax (SR ad hoc) TGax (MAC ad hoc)	TGax (full) (6 GHz discussions)		

Submissions for MU ad hoc were considered in the MAC ad hoc.

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-18-1373-05](#), TGax September 2018 Meeting Agenda
 - [11-18-1672-00](#), TGax September 2018 Closing Report
 - [11-18-1617-00](#), TGax September 2018 Waikoloa Meeting Minutes

Achievements

1. Work Completed

- The TG approved resolutions to 500+ technical comments
- The plan is to have draft D4.0 ready for recirculation after November meeting.
- The TG reviewed a number of submissions on 6 GHz discovery and management. More discussion is needed to reach consensus.
- The TG revisited the coexistence issues with members from 802.15 and 802.18.
- The TG is planning a 3-day ad hoc meeting in Shenzhen, China the week before the November F2F meeting on November 7-9. The PHY ad hoc has a 2-day meeting on November 8-9.

2. Technical Submissions

TGax received following submissions during the TGax sessions.

- PHY Submissions
 - [11-18-1258](#), "Punctured NDP Comment Resolution," Ron Porat (Broadcom Ltd.)
 - [11-18-1434](#), "CR on HE-SIG-A and HE-SIG-B - Part 1," Ross Jian Yu (Huawei Technologies)
 - [11-18-1435](#), "CR on HE-SIG-A and HE-SIG-B - Part 2," Ross Jian Yu (Huawei Technologies)
 - [11-18-1436](#), "CR on HE-SIG-A and HE-SIG-B - Part 3," Ross Jian Yu (Huawei Technologies)
 - [11-18-1441](#), "CR on HE-SIG-A and HE-SIG-B - Part 4," Xin Zuo (Huawei Technologies)
 - [11-18-1442](#), "Spec Text Changes Regarding Single Stream Pilot," Ross Jian Yu (Huawei Technologies)

- [11-18-1452](#), "CR on Packet Extension," Yujin Noh (Newracom)
- [11-18-1453](#), "CR on PHY subcarriers and RU part 1," Yujin Noh (Newracom)
- [11-18-1459](#), "Comment Resolution on PHY Introduction Part - 1," Lochan Verma (Qualcomm)
- [11-18-1460](#), "Comment Resolution on PHY Introduction Part - 2," Lochan Verma (Qualcomm)
- [11-18-1492](#), "Remaining PHY Math comment resolutions," Yan Zhang (Marvell)
- [11-18-1493](#), "Changes to D3.0," Xiaogang Chen (Intel)
- [11-18-1514](#), "Preamble Comment Resolution," Ron Porat (Broadcom Ltd.)
- [11-18-1522](#), "Comment Resolution of Nominal Packet Padding Definition," Hongyuan Zhang (Marvell)
- [11-18-1534](#), "D3.0 CR for PHY 28.3.4/28.3.16/28.3.17," Tianyu Wu (Samsung)
- [11-18-1590](#), "D3.0 Comment Resolution - Part 1," Youhan Kim (Qualcomm)
- [11-18-1591](#), "D3.0 Comment Resolution - Part 2," Youhan Kim (Qualcomm)
- [11-18-1601](#), "CR on HE-SIG-A and HE-SIG-B - Part 5," Ross Jian Yu (Huawei Technologies)
- MAC & MU Submissions
 - [11-18-0496](#), "Disallowed Sub channels," Matthew Fischer (Broadcom Ltd.)
 - [11-18-0946](#), "No Action frame in multi-TID A-MPDU," Robert Stacey (Intel)
 - [11-18-1181](#), "11ax D3.0 MAC Comment Resolution for FTM," Jonathan Segev (Intel)
 - [11-18-1189](#), "11ax D3.0 MAC Comment Resolution for NAV - Part I," Po-Kai Huang (Intel)
 - [11-18-1246](#), "OM Control Comment Resolutions," Jarkko Knecht (Apple)
 - [11-18-1266](#), "Resolution for CIDs related to Random Access," Abhishek Patil (Qualcomm)
 - [11-18-1320](#), "Resolution for CIDs related to Multiple BSSID," Abhishek Patil (Qualcomm)
 - [11-18-1415](#), "11ax D3.0 MAC Comment Resolution for SM Power Save," Po-Kai Huang (Intel)
 - [11-18-1418](#), "11ax D3.0 MAC Comment Resolution for MU-RTS/CTS - Part I," Po-Kai Huang (Intel)
 - [11-18-1432](#), "Doze Transition Signaling," Matthew Fischer (Broadcom Ltd.)
 - [11-18-1454](#), "Figure 27-12," Abhishek Patil (Qualcomm)
 - [11-18-1455](#), "Resolution for CIDs in 27.5.3.3," Abhishek Patil (Qualcomm)
 - [11-18-1458](#), "11ax D3.0 MAC Comment Resolution for Random Access with multiple BSS," Pascal Vigar (Canon Research)
 - [11-18-1465](#), "Comment resolutions for 9.4.2.200," Alfred Asterjadhi (Qualcomm)
 - [11-18-1466](#), "Comment resolutions for 10.43.1," Alfred Asterjadhi (Qualcomm)
 - [11-18-1467](#), "Comment resolutions for 27.16.1 not related to 6 GHz band," Alfred Asterjadhi (Qualcomm)
 - [11-18-1468](#), "Comment resolutions for 27.7.7," Alfred Asterjadhi (Qualcomm)
 - [11-18-1469](#), "Comment resolutions for 27.7.6," Alfred Asterjadhi (Qualcomm)
 - [11-18-1470](#), "Comment resolutions for 27.7.5," Alfred Asterjadhi (Qualcomm)
 - [11-18-1471](#), "Comment resolutions for 27.16.1 related to 6 Ghz band," Alfred Asterjadhi (Qualcomm)
 - [11-18-1484](#), "11ax D3.0 Comment Resolution 27.15.2," Liwen Chu (Marvell Semiconductors)
 - [11-18-1485](#), "11ax D3.0 Comment Resolution 27.5.3.2.1," Liwen Chu (Marvell Semiconductors)
 - [11-18-1486](#), "11ax D3.0 Comment Resolution 27.5.3.5," Liwen Chu (Marvell Semiconductors)
 - [11-18-1496](#), "CR for MU EDCA parameters," Laurent Cariou (Intel)
 - [11-18-1497](#), "CR for OPS," Laurent Cariou (Intel)
 - [11-18-1498](#), "CR for 27.5.6," Laurent Cariou (Intel)
 - [11-18-1501](#), "Remaining Ack related CRs on misc sections," George Cheria (Qualcomm)
 - [11-18-1502](#), "CR on differentiating non-TB and TB sounding," Robert Stacey (Intel)
 - [11-18-1504](#), "LB233 CR A-Control Subfield," Yongho Seok (MediaTek)
 - [11-18-1507](#), "11ax D3.0 MAC Comment Resolution for Co-located BSS," Po-Kai Huang (Intel)
 - [11-18-1511](#), "LB233 CR on CID 17024," Ming Han (Huawei Technologies)
 - [11-18-1512](#), "LB233 CR on MU Cascadingu," Ming Han (Huawei Technologies)
 - [11-18-1515](#), "11ax D3.0 MAC Comment Resolution for Bandwidth Queue Report," Zhou Lan (Broadcom Ltd.)
 - [11-18-1516](#), "11ax D3.0 MAC Comment Resolution for Bandwidth Queue Report," Zhou Lan (Broadcom Ltd.)
 - [11-18-1519](#), "11ax D3.0 MAC Comment Resolution for Control response," Robert Stacey (Intel)

- [11-18-1548](#), "CR for CID 15105," Kiseon Ryu (LG Electronics)
- SR Submission
 - [11-18-1410](#), "LB233 CR Spatial Reuse," Matthew Fischer (Broadcom Ltd.)
 - [11-18-1495](#), "CR for OBSS_PD," Laurent Cariou (Intel)
 - [11-18-1531](#), "TGax Spatial Reuse DSC and TPC," Graham Smith (SR Technologies)
- TG submissions
 - [11-18-1211](#), "Comment resolutions for 27.16.1 related to 6 Ghz band," Alfred Asterjadhi (Qualcomm)
 - [11-18-1227](#), "CR for 6GHz - Discovery," Laurent Cariou (Intel)
 - [11-18-1229](#), "CR for 6GHz - Policy," Laurent Cariou (Intel)
 - [11-18-1256](#), "802.11ax operation in 6GHz band," George Cherian (Qualcomm)>
 - [11-18-1489](#), "Operation at 6GHz Band," Liwen Chu (Marvell)
 - [11-18-1500](#), "CR for 6GHz - 6GHz Map," Laurent Cariou (Intel)
 - [11-18-1508](#), "11ax D3.0 MAC Comment Resolution for Multiple BSS," Po-Kai Huang (Intel)
 - [11-18-1532](#), "TGax Coexistence Assurance Document Comments," Eldad Perahia (HP Enterprize)
 - [11-18-1607](#), "6 GHz operation for 11ax," Ravi Gidvani (Samsung)
 - [11-18-1624](#), "Discovery Channels For 6 GHz Band," Alfred Asterjadhi (Qualcomm)

3. Timeline update

There are small adjustments to the TGax Timeline.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
November 2018	Mandatory Draft Review
November 2018	Draft 4.0 and Recirculation Ballot
February 2019	Formation of Sponsor Ballot pool
March 2019	Draft 5.0 and Recirculation (unchanged)
July 2019	Initial Sponsor Ballot
January 2020	RevCom submittal and publication

Goals for the November 2018 session

- Complete the resolution of comments received on draft D3.0.
- Generate draft D4.0.
- Go to the WG recirculation ballot.

Teleconferences

Following TGax teleconferences were authorized during the September 2018 session.



Thursday	September 20 th , 2018	10:00 - 12:00 (ET)
Thursday	September 27 th , 2018	20:00 - 22:00 (ET)
Thursday	October 04 th , 2018	10:00 - 12:00 (ET)
Thursday	October 11 th , 2018	20:00 - 22:00 (ET)
Thursday	October 18 th , 2018	10:00 - 12:00 (ET)
Thursday	November 01 st , 2018	10:00 - 12:00 (ET)

Additional TGax teleconference may be scheduled with 10-day notice if needed.

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July 2018 — San Diego, CA

TGax had eight sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (ad hoc)		TGax (with 802.19)	TGax (full)
AM2		TGax (full)		
PM1	TGax (full)			TGax (full)
PM2		TGax (full)	TGax (full)	
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-18-1036-05](#), TGax July 2018 Meeting Agenda
 - [11-18-1330-00](#), TGax July 2018 Closing Report
 - [11-18-1093-00](#), Draft TGax July 2018 San Diego Meeting Minutes

802.11 WG Letter Ballot #233

- The IEEE 802.11ax draft 3.0 passed the WG Letter Ballot #233 with 86.5 % approval ratio.
 - Visit <http://www.ieee802.org/11/LetterBallots.shtml> for more information.
- About 2250 comments are received.

Achievements

1. Work Completed

- The TG started the resolution of comments received on draft D3.0
- Members of 802.19 WG were invited to make a presentation on their concerns related to the TG Coexistence Assurance document.
 - [19-18-0040](#), "802.11ax and 802.15.4 HRP_LRP Coexistence," Tim Harrington (Pro-ID)
- The TG approved the proposed the PAR extension request and the revised CSD accommodating comments received from 802.3 WG.
- The TG prepared and approved a liaison response to WBA.
 - <https://mentor.ieee.org/802.11/dcn/18/11-18-1291-02-00ax-proposed-response-to-liaison-from-wba-on-11ax.docx>

2. Technical Submissions

TGax received following submissions during the TGax sessions.

- PHY Submissions
 - [11-18-0477](#), "Punctured NDP," Ron Porat (Broadcom Ltd.)
 - [11-18-1183](#), "Spec text change for error correction on STBC," Jianhan Liu (MediaTek)
- MAC Submissions
 - [11-18-0496](#), "Disallow Sub-Channels," Matthew Fischer (Broadcom Ltd.)
 - [11-18-1181](#), "CR in FTM," Jonathan Segev (Intel)
 - [11-18-1189](#), "CR for NAV Part 1," Po-kai Huang (Intel)
 - [11-18-1211](#), "MAC CR subclause 27.16.1," Alfred Asterjadhi (Qualcomm)
 - [11-18-1219](#), "CR for ER SU Disable," Po-Kau Huang (Intel)
 - [11-18-1220](#), "CR for Random Access," Po-Kai Huang (Intel)
 - [11-18-1244](#), "Resolutions for CIDs related to BSS Color," Abhishek Patil (Qualcomm)
 - [11-18-1252](#), "D3.0 Comment Resolution for CIDs on Clause 6," Jae Seung Lee (ETRI)
 - [11-18-1246](#), "CR for OMI," Jarkko Kneckt (Apple)
- MU Submission
 - [11-18-1266](#), "Resolution for CIDs related to random access - Part 1," Abhishek Patil (Qualcomm)
- TG submissions
 - [11-18-1227](#), "CR for 6GHz - Discovery," Laurent Cariou (Intel)
 - [11-18-1229](#), "CR for 6GHz - Policy," Laurent Cariou (Intel)
 - [11-18-1256](#), "11ax 6GHz Operation," George Cherian (Qualcomm)
 - [11-18-1258](#), "CR for Punctured NDP," Ron Porat (Broadcom Ltd.)

3. Timeline update

TG reviewed the timeline - No change.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot — Passes (86.5%)
July 2018	Mandatory Draft Review
November 2018	Draft 4.0 and Recirculation Ballot
February 2019	Formation of Sponsor Ballot pool

September 2019	Initial Sponsor Ballot
December 2019	RevCom submittal

Goals for the September 2018 session

- Continue the resolution of comments on draft D3.0.

Teleconferences

Following TGax teleconferences were authorized during the July 2018 plenary.

Thursday	July 26 th , 2018	10:00 - 12:00 (ET)
Thursday	August 02 nd , 2018	20:00 - 22:00 (ET)
Thursday	August 09 th , 2018	10:00 - 12:00 (ET)
Thursday	August 16 th , 2018	20:00 - 22:00 (ET)
Thursday	August 23 rd , 2018	10:00 - 12:00 (ET)
Thursday	August 30 th , 2018	20:00 - 22:00 (ET)
Thursday	September 20 rd , 2018	10:00 - 12:00 (ET)

Additional TGax teleconference may be scheduled with 10-day notice if needed.

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May 2018 — Warsaw, Poland

TGax had nine sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	TGax (full)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (full)			TGax (full)
PM2		TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (SR ad hoc) TGax (MAC ad hoc)	
PM3	TGax (SR ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC adx hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-18-0635-10](#), TGax May 2018 Meeting Agenda
 - [11-18-0976-00](#), TGax May 2018 Closing Report
 - [11-18-0888-00](#), TGax May 2018 Warsaw Meeting Minutes
 - TGax PHY ad hoc group
 - [11-18-0800-01](#), TGax May 2018 Meeting Agenda - PHY Ad Hoc
 - TGax MAC ad hoc group
 - [11-18-0914-03](#), TGax May 2018 MAC Ad Hoc Meeting Agenda
 - [11-18-0920-00](#), TGax MAC Ad hoc May 2018 Meeting Minutes
 - TGax SR ad hoc group
 - [11-18-0912-01](#), Agenda of the IEEE 802.11ax Spatial Reuse ad hoc group
 - [11-18-0922-00](#), IEEE 802.11ax Spatial Reuse ad hoc minutes

Achievements

1. Work Completed

- The TG completed resolution of comments submitted on draft D2.0.
- The TG passed a motion to instruct the TGax Editor to prepare draft D3.0 and start a 30-day WG letter Ballot.
- The TG approved the PAR extension.
- The TG approved the updated Coexistence Assurance document [11-16/1348r3](#) that has already been discussed during the TGax teleconference.
- No changes to the TG timeline.

2. Technical Submissions

TGax received following submissions during the TGax ad hoc meeting and in the TGax sessions.

- PHY Submissions
 - [11-18-0469](#), "CR Packet Extension," Ron Porat (Broadcom Ltd.)
 - [11-18-0477](#), "Punctured NDP," Ron Porat (Broadcom Ltd.)
 - [11-18-0725](#), "Comment Resolutions on PHY Sounding Part 1," Lochan Verma (Qualcomm)
 - [11-18-0753](#), "PHY CR on midamble TxEVM," Hongyuan Zhang (Marvell Semiconductors)
 - [11-18-0754](#), "CID14038 scrambler," Hongyuan Zhang (Marvell Semiconductors)
 - [11-18-0755](#), "HE Capabilities on HE MU single user full BW," Hongyuan Zhang (Marvell Semiconductors)
 - [11-18-0756](#), "Capabilities on midamble Tx," Hongyuan Zhang (Marvell Semiconductors)
 - [11-18-0765](#), "CR on HE PHY MIB attributes," Edward Au (Huawei Technologies)
 - [11-18-0779](#), "D2.0 PHY Comment Resolution - Part 3," Youhan Kim (Qualcomm)
 - [11-18-0799](#), "Comment resolution on CIDs 11727 and 12102," Jianhan Liu (MediaTek)
 - [11-18-0803](#), "Spec text change on PHY padding," Tianyu Wu (Samsung)
 - [11-18-0806](#), "PHY Miscellaneous CIDs," Bin Tian (Qualcomm)
 - [11-18-0807](#), "D2.0 DFS Comment Resolution," Youhan Kim (Qualcomm)
 - [11-18-0815](#), "D2.0 DFS Comment Resolution," Sigurd Schelstraete (Quantenna Communications)
 - [11-18-0819](#), "comment-resolution-on-cids-for-28-3-part-3," Jianhan Liu (MediaTek)
 - [11-18-0823](#), "D2.0 CR for SAP and TRIGVECTOR," Tianyu Wu (Samsung)
 - [11-18-0868](#), "Spec. change on Receiver minimum input sensitivity on 1024-QAM for 20MHz bandwidth," Jianhan Liu (MediaTek)
- MAC Submissions
 - [11-17-1860](#), "Resolution for CID 11002," Abhishek Patil (Qualcomm)
 - [11-18-0044](#), "LB230 MAC CR 27.7 and 27.7.1," Alfred Asterjadhi (Qualcomm)

- [11-18-0077](#), "D2.0 comment resolution 27.4.2," Liwen Chu (Marvell)
- [11-18-0083](#), "LB230 CR for BSS Load Text," Frank Hsu (MediaTek)
- [11-18-0155](#), "Resolutions for CIDs related to GCR," Yusuke Tanaka (SONY)
- [11-18-0161](#), "CR CID 13754," Zhou Lan (Broadcom Ltd)
- [11-18-0181](#), "LB230 CR on BSS Load Information in subclause 9.4.2," Ming Gan (Huawei)
- [11-18-0200](#), "Decouple Channel Width Capabilities Between VHT and HE Modes," Huizhao Wang
- [11-18-0218](#), "Fragment Flushing BlockAckReq," Matthew Fischer (Broadcom Ltd.)
- [11-18-0368](#), "Multiple BSSID," Abhishek Patil (Qualcomm)
- [11-18-0378](#), "Comment resolutions for 9.3.1.20 Ppart 2," Alfred Asterjadhi (Qualcomm)
- [11-18-0380](#), "Comment resolution for some CIDs in 9.4.2.237," Alfred Asterjadhi (Qualcomm)
- [11-18-0424](#), "D2.0 comment resolution-CID 11327," Liwen Chu (Marvell)
- [11-18-0425](#), "D2.0 comment resolution 9.7.1," Liwen Chu (Marvell)
- [11-18-0426](#), "D2.0 comment resolution 9.7.3," Liwen Chu (Marvell)
- [11-18-0427](#), "D2.0 comment resolution 27.10.2," Liwen Chu (Marvell)
- [11-18-0428](#), "D2.0 comment resolution 27.10.3," Liwen Chu (Marvell)
- [11-18-0431](#), "comment-resolution-on-cid-13082-13083-and-14141," Jason Yuchen Guo (Huawei)
- [11-18-0454](#), "CR for CID 11499 and 14324," Kiseon Ryu (LG Electronics)
- [11-18-0496](#), "Disallowed Sub-Channels," Matthew Fischer (Broadcom Ltd.)
- [11-18-0548](#), "CR for CID 13415," Yunbo Li (Huawei)
- [11-18-0558](#), "Comment resolution for 27.2.2 part 1," Kaiying Lv (ZTE)
- [11-18-0602](#), "LB230 CR CID 13870," Yongho Seok (MediaTek)
- [11-18-0603](#), "LB230 CR CID 13530 and 14183," Yongho Seok (MediaTek)
- [11-18-0604](#), "LB230 CR Preamble Puncturing," Yongho Seok (MediaTek)
- [11-18-0627](#), "LB230 CR HT Control," Yongho Seok (MediaTek)
- [11-18-0628](#), "LB230 CR STA_ID_LIST," Yongho Seok (MediaTek)
- [11-18-0629](#), "LB230 CR UPLINK_FLAG," Yongho Seok (MediaTek)
- [11-18-0630](#), "LB230 CR HE Sounding NDP," Yongho Seok (MediaTek)
- [11-18-0660](#), "Comment resolution for several miscellaneous comments part 2," Alfred Asterjadhi (Qualcomm)
- [11-18-0661](#), "Comment resolution for 27.7.2," Alfred Asterjadhi (Qualcomm)
- [11-18-0662](#), "LB230-MAC-CR-27.7.3.1," Alfred Asterjadhi (Qualcomm)
- [11-18-0663](#), "LB230-MAC-CR-27.7.3.2," Alfred Asterjadhi (Qualcomm)
- [11-18-0664](#), "LB230-MAC-CR-27.7.3.3," Alfred Asterjadhi (Qualcomm)
- [11-18-0665](#), "LB230-MAC-CR-10.22.2.9-revisit," Alfred Asterjadhi (Qualcomm)
- [11-18-0684](#), "LB230-MAC-CR-Misc Part 3," Alfred Asterjadhi (Qualcomm)
- [11-18-0685](#), "LB230-MAC-CR-Misc Part 4," Alfred Asterjadhi (Qualcomm)
- [11-18-0688](#), "CR for NAV Part IV," Po-Kai Huang (Intel)
- [11-18-0693](#), "Multiple BSSID Group Addressed Transmission," Po-Kai Huang (Intel)
- [11-18-0705](#), "CR-section 4 and 5," Guoqing Li (Apple)
- [11-18-0717](#), "Remaining Ack related CRs," George Cherian (Qualcomm)
- [11-18-0720](#), "Comment Resolution for 27.15.2," Guoqing Li (Apple)
- [11-18-0724](#), "Remaining Ack related CRs on misc sections," George Cherian (Qualcomm)
- [11-18-0726](#), "LB230 CR MAC Miscellaneous," Yongho Seok (Mediatek)
- [11-18-0733](#), "Resolutions to LB230 comments submitted to subclauses 9.3.1.8 and 10.24.6," Tomoko Adachi (Toshiba)
- [11-18-0734](#), "Resolutions to LB230 comments submitted to subclause 9.3.1.9.1," Tomoko Adachi (Toshiba)
- [11-18-0737](#), "Single-STA trigger-based sounding," Mark Rison (Samsung)
- [11-18-0739](#), "CIDs in 27.7.3.1 (TWT)," Abhishek Patil (Qualcomm)
- [11-18-0740](#), "Various CIDs in Clause 9," Abhishek Patil (Qualcomm)
- [11-18-0741](#), "Various CIDs in 27.5," Abhishek Patil (Qualcomm)
- [11-18-0744](#), "CID 13078," Abhishek Patil (Qualcomm)

- [11-18-0745](#), "CR BQR part2," Zhou Lan (Broadcom Ltd.)
- [11-18-0763](#), "CR for PICS comments on D2.0 - Part 2," Edward Au (Huawei)
- [11-18-0764](#), "LB230 CR on Fragmentation - Part 3," Ming Gan (Huawei)
- [11-18-0767](#), "CR related to 27.5.6 - Misc," Laurent Cariou (Intel)
- [11-18-0792](#), "11ax D2.0 Comment Resolution 10.13.1 10.13.3," Liwen Chu (Marvell)
- [11-18-0793](#), "11ax D2.0 Comment Resolution 9.4.2.237.2," Liwen Chu (Marvell)
- [11-18-0794](#), "11ax D2.0 Comment Resolution CID 11314, 12883," Liwen Chu (Marvell)
- [11-18-0795](#), "11ax D2.0 BSS Operation BW," Liwen Chu (Marvell)
- [11-18-0796](#), "11ax D2.0 Comment Resolution 27.10.4.2, 27.10.4.3," Liwen Chu (Marvell)
- [11-18-0797](#), "11ax D2.0 Comment Resolution 27.10.4.1," Liwen Chu (Marvell)
- [11-18-0798](#), "11ax D2.0 Comment Resolution 9.4.1.62," Liwen Chu (Marvell)
- [11-18-0811](#), "11ax D2.0 MAC Comment Resolution for Dynamic Fragmentation Coexistence," Frank Hsu (MediaTek)
- [11-18-0813](#), "CR for CID 12295," Jeongki Kim (LG Electronics)
- [11-18-0869](#), "CR on remaining CIDs for BSR," Kiseon Ryu (LG Electronics)
- [11-18-0890](#), "Resolutions to LB230 comments submitted to subclauses 9.3.1.9.3 and 9.3.1.9.7," Tomoko Adachi (Toshiba)
- MU Submissions
 - [11-18-0388](#), "Comment resolution for CID 13084," Stephane Baron (Canon Research)
 - [11-18-0390](#), "CIDs related to Random Access for unassociated STAs," Stephane Baron (Canon Research)
 - [11-18-0445](#), "ACK non QoS data frame in TB PPDU," Zhou Lan (Broadcom Ltd.)
 - [11-18-0692](#), "Comment Resolution for Random Access," Po-Kai Huang (Intel)
 - [11-18-0694](#), "CIDs resolution for UORA procedure - part 2," Stephane Baron (Canon Research)
 - [11-18-0695](#), "CIDs resolution for UORA procedure - part 1," Stephane Baron (Canon Research)
 - [11-18-0707](#), "CIDs related to MU Cascading," David Xun Yang (Huawei Technologies)
 - [11-18-0724](#), "CIDs related to random access," Abhishek Patil (Qualcomm)
 - [11-18-0906](#), "DL MU MIMO signaling," Guoqing Li (Apple)
- SR Submissions
 - [11-18-0026](#), "CR-SRG-and-SRP," Matthew Fischer (Broadcom Ltd.)
 - [11-18-0225](#), "CR-SRG-Management-CID-12044-12304," Matthew Fischer (Broadcom Ltd.)
 - [11-18-0456](#), "1b230-cr-txvector-parameter-bss-color," Yongho Seok (MediaTek)
 - [11-18-0579](#), "11ax D2.0 CR on SR and CCA," Yuichi Morioka (Sony)
 - [11-18-0617](#), "Dynamic OBSS_PD level," Graham Smith (SR Technologies)
 - [11-18-0743](#), "CIDs related to BSS Color," Abhishek Patil (Qualcomm)
- TG Submission
 - [11-18-0902](#), "CID 12102: Remove DCM," Sean Coffey (RealTek)

3. Timeline update

TG reviewed the timeline - No change.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017

May 2018	Draft 3.0 and WG Letter Ballot
July 2018	Mandatory Draft Review
February 2019	Formation of Sponsor Ballot pool
May 2019	Initial Sponsor Ballot
December 2019	RevCom submittal

Goals for the July 2018 session

- Start resolving comments received on draft D3.0.

Teleconferences

Following TGax teleconferences has already approved during the March 2018 plenary.

Thursday	May 17 th , 2018	10:00 - 12:00 (ET)
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Additional TGax teleconference may be scheduled with 10-day notice if needed.

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March 2018 — Rosemont, IL

TGax had ten sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full, ad hoc)	TGax (MAC & MU ad hoc)	TGax (full)	
AM2		TGax (PHY ad hoc) TGax (MAC & MU ad hoc)		TGax (full)
PM1	TGax (full)			
PM2		TGax (PHY ad hoc) TGax (MAC & MU ad hoc)	TGax (PHY ad hoc) TGax (MAC & MU ad hoc)	TGax (full)
PM3		TGax (SR ad hoc) TGax (MAC & MU ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-18-0286-06](#), TGax March 2018 Meeting Agenda
 - [11-18-0582-00](#), TGax March 2018 Closing Report
 - [11-18-0518-00](#), TGax March 2018 Rosemont Meeting Minutes

- TGax PHY ad hoc group
 - [11-18-0535-02](#), TGax March 2018 Meeting Agenda - PHY Ad Hoc
 - [11-18-0594-00](#), IEEE 802.11 TGax March 2018 Rosemont Plenary Ad Hoc Meeting Minutes
- TGax MAC/MU ad hoc group
 - [11-18-0545-04](#), TGax MU/MAC Ad-hoc March 2018 Meeting Agenda
 - [11-18-0566-00](#), March 2018 TGax MAC/MU Ad hoc Meeting Minutes
- TGax SR ad hoc group
 - [11-18-0526-02](#), 802.11ax Spatial Reuse Ad Hoc Group Agenda

Achievements

1. Work Completed

- Approved resolutions to over 800 technical CIDs.
- The TG Editor is planning to produce a new revision based on approved resolutions.
- A TG motion passed to hold an ad hoc meeting in Rennes during the period from February 28th to March 2nd, 2018.
- No changes to the TG timeline.

2. Technical Submissions

TGax received following submissions during the TGax ad hoc meeting and in the TGax sessions.

- MAC/MU Submissions
 - [11-17-1860](#), "Resolution for CID 11002," Abhishek Patil (Qualcomm)
 - [11-18-0012](#), "Comment resolutions for 27.15.2, Alfred Asterjadhi (Qualcomm)
 - [11-18-0029](#), "Default UORA Parameters," Matthew Fischer (Broadcom)
 - [11-18-0044](#), "Comment resolutions for 27.7 and 27.7.1," Alfred Asterjadhi (Qualcomm)
 - [11-18-0055](#), "CR for CID 14324," Zhou Lan (Broadcom)
 - [11-18-0056](#), "CR for CID 14328," Zhou Lan (Broadcom)
 - [11-18-0075](#), "11ax D2.0 Comment Resolution 27.5.3.2.2," Liwen Chu (Marvell)
 - [11-18-0078](#), "11ax D2.0 Comment Resolution 27.6.4," Liwen Chu (Marvell)
 - [11-18-0149](#), "CR for NDP feedback report - part 1," Laurent Cariou (Intel)
 - [11-18-0161](#), "CR of CID 13754," Zhou Lan (Broadcom)
 - [11-18-0185](#), "CR of CID 11001," Zhou Lan (Broadcom)
 - [11-18-0200](#), "Decouple Channel Width Capabilities between VHT and HE PHY Mode," Huizhao Wang (Quantenna)
 - [11-18-0218](#), "Fragment Flushing BlockAckReq," Matthew Fischer (Broadcom)
 - [11-18-0241](#), "Comment resolutions for Misc CIDs," Alfred Asterjadhi (Qualcomm)
 - [11-18-0312](#), "Comment resolutions for 27.6.3," Alfred Asterjadhi (Qualcomm)
 - [11-18-0337](#), "Comment resolutions for 10.43" Alfred Asterjadhi (Qualcomm)
 - [11-18-0338](#), "Comment resolutions for 27.16.1," Alfred Asterjadhi (Qualcomm)
 - [11-18-0343](#), "Comment resolutions for CID 13744," Alfred Asterjadhi (Qualcomm)
 - [11-18-0360](#), "CIDs related to Random Accessb - Part 2," Abhishek Patil (Qualcomm)
 - [11-18-0361](#), "visio file for fig 10-1," Abhishek Patil (Qualcomm)
 - [11-18-0362](#), "CIDs in 10.2.6," Abhishek Patil (Qualcomm)
 - [11-18-0363](#), "Resolution for CID 13136," Abhishek Patil (Qualcomm)
 - [11-18-0364](#), "CID 11001," Abhishek Patil (Qualcomm)
 - [11-18-0365](#), "CIDs related to BSS Color - Part 1," Abhishek Patil (Qualcomm)
 - [11-18-0366](#), "Resolutions to various CIDs in Trigger Frame format," Abhishek Patil (Qualcomm)
 - [11-18-0367](#), "Resolutions to CIDs in 27.5.3.3," Abhishek Patil (Qualcomm)
 - [11-18-0368](#), "Address inconsistencies & ambiguities in 11.1.3.8 (Multiple BSSID topic)," Abhishek Patil (Qualcomm)
 - [11-18-0369](#), "Resolutions to various CIDs in clause 9," Abhishek Patil (Qualcomm)
 - [11-18-0370](#), "Comment resolutions for 27.7.5," Alfred Asterjadhi (Qualcomm)
 - [11-18-0371](#), "Comment resolutions for 27.7.4," Alfred Asterjadhi (Qualcomm)

- [11-18-0372](#), "Comment resolutions for 9.4.2.200 part 2," Alfred Asterjadhi (Qualcomm)
- [11-18-0373](#), "Comment resolutions for 27.7.3.4," Alfred Asterjadhi (Qualcomm)
- [11-18-0379](#), "Comment resolutions for 9.3.3.X," Alfred Asterjadhi (Qualcomm)
- [11-18-0380](#), "Comment resolutions for some CIDs in 9.4.2.237," Alfred Asterjadhi (Qualcomm)
- [11-18-0390](#), "CIDs related to 27.5.1," Pascal Viger (Canon Research)
- [11-18-0423](#), "11ax D2.0 Comment Resolution CID14318," Liwen Chu (Marvell)
- [11-18-0425](#), "11ax D2.0 Comment Resolution 9.7.1," Liwen Chu (Marvell)
- [11-18-0426](#), "11ax D2.0 Comment Resolution 9.7.3," Liwen Chu (Marvell)
- [11-18-0427](#), "11ax D2.0 Comment Resolution 27.10.2," Liwen Chu (Marvell)
- [11-18-0428](#), "11ax D2.0 Comment Resolution 27.10.2," Liwen Chu (Marvell)
- [11-18-0429](#), "11ax D2.0 Comment Resolution 27.5.3.2.4 remaining CIDs," Liwen Chu (Marvell)
- [11-18-0432](#), "LB230 CR on Fragmentation - Part 4," Ming Gan (Huawei)
- [11-18-0433](#), "LB230 CR on Fragmentation - Part 2," Ming Gan (Huawei)
- [11-18-0443](#), "11ax D1.0 MAC Comment Resolution for 9.4.2.24," Chao-Chun Wang (MediaTek)
- [11-18-0444](#), "11ax D2.0 MAC Comment Resolution for 27.16.4," Chao-Chun Wang (MediaTek)
- [11-18-0455](#), "LB230 CR TXOP duration-based RTS/CTS," Yongho Seok (MediaTek)
- [11-18-0512](#), "11ax D2.0 Comment Resolution for CID 14207," Yunbo Li (Huawei)
- SR Submissions
 - [11-18-0026](#), "CR SRG and SRP," Matthew Fischer (Broadcom)
 - [11-18-0106](#), "LB230 CR Spatial Reuse Operation on Secondary Channel," Yongho Seok (MediaTek)
 - [11-18-0225](#), "CR Spatial Reuse Group Management CID 12044 12304," Matthew Fischer (Broadcom)
 - [11-18-0391](#), "CID 11775 Should be re-considered," Graham Smith (SR Technologies)
- PHY Submissions
 - [11-18-0059](#), "PPE Threshold Field," Hongyuan Zhang (Marvell)
 - [11-18-0110](#), "11ax Comment Resolutions for PHY Preamble," Yan Zhang (Marvell)
 - [11-18-0111](#), "11ax Comment Resolutions for PHY Data field," Yan Zhang (Marvell)
 - [11-18-0136](#), "Comment Resolutions for Clause 28.2.2 (TXVECTOR and RXVECTOR parameters) Part 1," Bo Sun (ZTE)
 - [11-18-0150](#), "CR for CIDs related to HE ER SU PPDU," Tianyu Wu (MediaTek)
 - [11-18-0151](#), "CR for PHY PPDU formats," Tianyu Wu (MediaTek)
 - [11-18-0162](#), "LB230 CR on CID 12060 and 13047," Ming Gan (Huawei)
 - [11-18-0324](#), "CR on HE-SIG-B part 3," Yujin Noh (Newracom)
 - [11-18-0349](#), "Comment Resolutions on Clause 28.3.3 (OFDMA and SU Tone Allocation)," Jung Hoon Suh (Huawei)
 - [11-18-0352](#), "CR for HE-SIG-B," Tianyu Wu (MediaTek)
 - [11-18-0359](#), "PHY Comment Resolution on 1024 QAM," Ron Porat (Broadcom)
 - [11-18-0404](#), "Comment Resolutions on PHY INTRODUCTION Part 4," Lochan Verma (Qualcomm)
 - [11-18-0409](#), "Comment Resolutions on PHY INTRODUCTION Part 5," Lochan Verma (Qualcomm)
 - [11-18-0463](#), "Proposed Changes to D2.2 Clause 28.3.20, 28.3.21," Xiaogang Chen (Intel)
 - [11-18-0469](#), "PHY Comment Resolution on Packet Extension," Ron Porat (Broadcom)
 - [11-18-0475](#), "Comment resolution on CIDs on Clause 28.3 Part 2," Jianhan Liu (MediaTek)
 - [11-18-0476](#), "Comment resolution on CIDs on Clause 28.3.18.1 for signal leakage to preamble punctured channels," Jianhan Liu (MediaTek)
 - [11-18-0478](#), "Comment resolution on CID 11896," Jianhan Liu (MediaTek)
 - [11-18-0483](#), "Corrections to "Number Of HE-LTF Symbols And Midamble Periodicity" subfield," Sigurd Schelstraete (Quantenna)
 - [11-18-0508](#), "D2.0 PHY Comment Resolution - Part 2," Youhan Kim (Qualcomm)

3. Timeline update

TG reviewed the timeline - No change.

Current Timeline	

May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot
July 2018	Mandatory Draft Review
February 2019	Formation of Sponsor Ballot pool
May 2019	Initial Sponsor Ballot
December 2019	RevCom submittal

Goals for the May 2018 session

- Complete comment resolution and initiate a 30-day WG letter ballot.
- Approve a new revision of the Coexistence. Assurance document taking into account the new added band.
- Prepare and approve PAR extension.

Teleconferences

TGax teleconferences are scheduled after the March 2018 session as follows:

Thursday	March 22 nd , April 5 th , April 19 th , 2018	10:00 - 12:00 (ET)
Thursday	March 29 th , April 12 th , April 26 th , 2018	20:00 - 22:00 (ET)
Thursday	May 17 th , 2018	10:00 - 12:00 (ET)

TGax PHY calls are scheduled instead of face-to-face ad hoc meeting:

Wednesday	May 2 nd , 2018	20:00 - 22:00 (ET)
Thursday	May 3 rd , 2018	20:00 - 22:00 (ET)
Friday	May 4 th , 2018	10:00 - 12:00 (ET)

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January 2018 — Orlando, FL

TGax had nine sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2		TGax (PHY ad hoc) TGax (MAC & MU ad hoc)		TGax (full)
PM1	TGax (full)			
PM2		TGax (PHY ad hoc) TGax (MAC & MU ad hoc)	TGax (PHY ad hoc) TGax (MAC & MU ad hoc)	TGax (full)
PM3	TGax (PHY ad hoc) TGax (MAC & MU ad hoc)	TGax (SR ad hoc) TGax (MAC & MU ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-17-1851-06](#), TGax January 2018 Meeting Agenda
 - [11-18-0213-00](#), TGax January 2018 Irvine Meeting Minutes
 - [11-18-0261-00](#), TGax January 2018 Closing Report
 - TGax PHY ad hoc group
 - [11-18-0201-03](#), TGax January 2018 Meeting Agenda - PHY Ad Hoc
 - [11-18-0255-00](#), IEEE 802.11 TGax Jan 2018 Irvine Interim PHY Ad Hoc Meeting Minutes
 - TGax MAC MU ad hoc group
 - [11-18-0204-02](#), TGax MAC-MU Ad-hoc January 2018 Meeting Agenda
 - [11-18-0245-00](#), IEEE 802.11 TGax Jan 2018 TGax MAC/MU Ad hoc Meeting Minutes
 - TGax SR ad hoc group
 - [11-18-0217-01](#), Agenda of the IEEE 802.11ax Spatial Reuse ad hoc group
 - [11-18-0239-00](#), Minutes of the January 2018 meeting of the IEEE 802.11ax Spatial Reuse ad hoc group

Achievements

1. Work Completed

- Approved resolutions for about 750 technical CIDs.
- Approved resolutions of Editorial CIDs implemented in draft D 2.1.
- The TG Editor is planning to produce a new revision based on approved resolutions.
- A TG motion passed to hold an ad hoc meeting in the Bay Area during the period from February 28th to March 2nd, 2018.
- No changes to the TG timeline.

2. Technical Submissions

TGax received following submissions during the TGax ad hoc meeting and in the TGax sessions.

- PHY - 25 submissions
 - [11-18-0006](#), "Misc CR," Ross Jian Yu (Huawei Technologies)
 - [11-18-0023](#), "Changes to D2.0 Clause 28.2.5, 28.2.6," Xiaogang Chen (Intel)
 - [11-18-0024](#), "Changes to D2.0 Clause 28.3.5," Xiaogang Chen (Intel)
 - [11-18-0025](#), "Proposed Changes to D2.0 Clause 28.3.6," Xiaogang Chen (Intel)

- [11-18-0028](#), "Proposed Changes to D2.0 on the HE TB NDP feedback," Xiaogang Chen (Intel)
- [11-18-0036](#), "Comment Resolutions on PHY INTRODUCTION Part 1," Lochan Verma (Qualcomm)
- [11-18-0037](#), "Comment Resolutions on PHY INTRODUCTION Part 2," Lochan Verma (Qualcomm)
- [11-18-0038](#), "Comment Resolutions on HE-SIG-A Part 1," Lochan Verma (Qualcomm)
- [11-18-0046](#), "Comment Resolutions on PHY INTRODUCTION Part 3," Lochan Verma (Qualcomm)
- [11-18-0050](#), "CR on HE-SIG-B part 1," Yujin Noh (Newracom)
- [11-18-0051](#), "CR on HE-SIG-B part 2," Yujin Noh (Newracom)
- [11-18-0057](#), "D2.0 PHY Comment Resolution," Youhan Kim (Qualcomm)
- [11-18-0058](#), "Comment Resolutions on Midamble," Hongyuan Zhang (Marvell Semiconductors)
- [11-18-0059](#), "PPE Threshold Field," Hongyuan Zhang (Marvell Semiconductors)
- [11-18-0079](#), "Comment Resolutions on Clause 28.3.15 (SU-MIMO and DL MU-MIMO beamforming)," Kome Oteri (InterDigital)
- [11-18-0080](#), "Comment Resolutions on Clause 9.4.1.63 D2.0 (HE Compressed Beamforming Report field)," Kome Oteri (InterDigital)
- [11-18-0109](#), "11ax Comment Resolutions for PHY mathematical descriptions," Yan Zhang (Marvell Semiconductors)
- [11-18-0110](#), "11ax Comment Resolutions for PHY Preamble," Yan Zhang (Marvell Semiconductors)
- [11-18-0111](#), "11ax Comment Resolutions for PHY Data field," Yan Zhang (Marvell Semiconductors)
- [11-18-0118](#), "PHY Comment Resolution," Ron Porat (Broadcom Ltd.)
- [11-18-0136](#), "Comment Resolutions for Clause 28.2.2 (TXVECTOR and RXVECTOR parameters) Part 1," Bo Sun (ZTE)
- [11-18-0150](#), "CR for CIDs related to HE ER SU PPDU," Tianyu Wu (Samsung)
- [11-18-0151](#), "CR for PHY PPDU formats," Tianyu Wu (Samsung) - not on the server
- [11-18-0159](#), "Comment resolution on CIDs on Clause 28.3 Part 1," Jianhan Liu (MediaTek)
- [11-18-0162](#), "LB230 CR on CID 12060 and 13047," Ming Gan (Huawei Technologies)
- [11-18-0187](#), "Tx EVM for Beamformed Transmission," Bin Tian (Qualcomm) - not on the server
- [11-18-0230](#), "Misc CR Follow up," Ross Jian Yu (Huawei Technologies)
- MAC 37 submissions
 - [11-17-1837](#), "11ax D2.0 Comment Resolution 27.5.3.5," Liwen Chu (Marvell Semiconductors)
 - [11-17-1847](#), "CIDs related to Multiple BSSID topic - Part 1," Abhishek Patil (Qualcomm)
 - [11-17-1850](#), "Resolution for CIDs in 9.4.2.37," Abhishek Patil (Qualcomm)
 - [11-17-1857](#), "CIDs related to Multiple BSSID topic - Part 2," Abhishek Patil (Qualcomm)
 - [11-17-1858](#), "Resolution for CID 13142," Abhishek Patil (Qualcomm)
 - [11-17-1859](#), "Resolution for CID 11742," Abhishek Patil (Qualcomm)
 - [11-17-1861](#), "CIDs related to Multiple BSSID topic - Part 3," Abhishek Patil (Qualcomm)
 - [11-17-1874](#), "11ax D2.0 MAC Comment Resolution for NAV Part I," Po-Kai Huang (Intel)
 - [11-17-1893](#), "CR TWT IE," Matthew Fischer (Broadcom Ltd.)
 - [11-18-0009](#), "LB230 MAC CR 10.22.2.4," Alfred Asterjadhi (Qualcomm)
 - [11-18-0010](#), "LB230 MAC CR 26.8.36," Alfred Asterjadhi (Qualcomm)
 - [11-18-0012](#), "LB230 MAC CR 27.15.2," Alfred Asterjadhi (Qualcomm)
 - [11-18-0013](#), "LB230 MAC CR 27.15.3," Alfred Asterjadhi (Qualcomm)
 - [11-18-0014](#), "LB230 MAC CR 27.15.4," Alfred Asterjadhi (Qualcomm)
 - [11-18-0015](#), "LB230 MAC CR 27.17," Alfred Asterjadhi (Qualcomm)
 - [11-18-0027](#), "Ack related CIDs Section 27.4," George Cherian (Qualcomm)
 - [11-18-0035](#), "OMI Comment Resolutions," Jarkko Knecht (Apple)
 - [11-18-0039](#), "LB230 MAC CR 10.22.2.5," Alfred Asterjadhi (Qualcomm)
 - [11-18-0040](#), "LB230 MAC CR 10.22.2.6-9," Alfred Asterjadhi (Qualcomm)
 - [11-18-0041](#), "LB230 MAC CR 11.24," Alfred Asterjadhi (Qualcomm)
 - [11-18-0044](#), "LB230 MAC CR 27.7 and 27.7.1," Alfred Asterjadhi (Qualcomm) - not on the server
 - [11-18-0055](#), "CR CID 14324," Zhou Lan (Broadcom Ltd.)
 - [11-18-0066](#), "Resolution for CIDs in 9.4.2.245," Abhishek Patil (Qualcomm)

- [11-18-0068](#), "Resolution for CID 11374," Abhishek Patil (Qualcomm)
- [11-18-0074](#), "11ax D2.0 Comment Resolution 27.5.3.2.4 10.22.2.7," Liwen Chu (Marvell)
- [11-18-0075](#), "11ax D2.0 comment resolution 27.5.3.2.2," Liwen Chu (Marvell)
- [11-18-0076](#), "11ax D2.0 comment resolution 27.5.3.2.3," Liwen Chu (Marvell)
- 11-18-0077, "11ax D2.0 comment resolution 27.4.2," Liwen Chu (Marvell) - not on the server
- [11-18-0078](#), "11ax D2.0 comment resolution 27.6.4," Liwen Chu (Marvell)
- [11-18-0081](#), "11ax D2.0 MAC Comment Resolution for HE link adaptation," Frank Hsu (MediaTek)
- 11-18-0082, "LB230 CR for BSS Load Slides," Frank Hsu (MediaTek) - not on the server
- 11-18-0083, "LB230 CR for BSS Load Text," Frank Hsu (MediaTek) - not on the server
- 11-18-0088, "CR CID 14349," Zhou Lan (Broadcom Ltd.) - not on the server
- [11-18-0090](#), "CR for Opportunistic power save," Laurent Carious (Intel)
- [11-18-0098](#), "LB230 CR on CIDs 12757, 11149 and 13675," Ming Gan (Huawei Technologies)
- [11-18-0099](#), "LB230 CR on Fragmentation - Part 1," Ming Gan (Huawei Technologies)
- [11-18-0105](#), "LB230 CR Multi-TID Capability Indication," Yongho Seok (MediaTek)
- 11-18-0107, "LB230 CR 20MHz only STA on Secondary Channel," Yongho Seok (MediaTek) - not on the server
- 11-18-0149, "CR for 27.5.6," Laurent Cariou (Intel) - not on the server
- [11-18-0153](#), "Resolution for CID 11742," Po-Kai Huang (Intel)
- [11-18-0155](#), "Resolutions for CIDs related to GCR," Yusuke Tanaka (Sony)
- [11-18-0161](#), "CR of CID 13754," Zhou Lan (Broadcom Ltd.)
- [11-18-0182](#), "11ax D2.0 MAC Comment Resolution for CID 18555," Guoqing Li (Apple)
- [11-18-0200](#), "Decouple Channel Width Capabilities between VHT and HE PHY Mode," Huizhao Wang (Quantenna Communications)
- Multi-User (MU) - 19 submissions
 - [11-17-1828](#), "CR for MU EDCA parameters," Laurent Cariou (Intel)
 - [11-17-1849](#), "CIDs related to Random Access - Part 1," Abhishek Patil (Qualcomm)
 - [11-17-1860](#), "Resolution for CID 11002," Abhishek Patil (Qualcomm)
 - [11-17-1878](#), "11ax D2.0 MAC Comment Resolution for NAV Part II," Po-Kai Huang (Intel)
 - [11-18-0008](#), "LB230-MAC-CR-9.3.1.20," Alfred Asterjadhi (Qualcomm)
 - [11-18-0011](#), "Comment resolutions for 27.5.3.4," Alfred Asterjadhi (Qualcomm)
 - [11-18-0029](#), "Default UORA Parameters," Matthew Fischer (Broadcom Ltd.)
 - 11-18-0030, "ER DL Protection Sequence," Matthew Fischer (Broadcom Ltd.) - not on the server
 - [11-18-0031](#), "BQRP BQR LCTS DL MU," Matthew Fischer (Broadcom Ltd.)
 - [11-18-0042](#), "Comment resolutions for 27.6.2," Alfred Asterjadhi (Qualcomm)
 - [11-18-0043](#), "Comment resolutions for 27.6 and 27.6.1," Alfred Asterjadhi (Qualcomm)
 - [11-18-0053](#), "CR of BQR (on D2.0)," Zhou Lan (Broadcom Ltd.)
 - [11-18-0054](#), "CR of DL MU procedure (D2.0)," Zhou Lan (Broadcom Ltd.)
 - [11-18-0056](#), "CR of CID 14328," Zhou Lan (Broadcom Ltd.)
 - [11-18-0063](#), "CR on UORA Power Saving," Jeongki Kim (LG Electronics)
 - [11-18-0065](#), "Resolution for CIDs in 9.3.1.23," Abhishek Patil (Qualcomm)
 - [11-18-0079](#), "Comment Resolutions on Clause 28.3.15 (SU-MIMO and DL MU-MIMO beamforming)," Kome Oteri (InterDigital)
 - [11-18-0080](#), "Comment Resolutions on Clause 9.4.1.63 D2.0 (HE Compressed Beamforming Report field)," Kome Oteri (InterDigital)
 - [11-18-0108](#), "CIDs for: Section 27.5.3.6 HE buffer status feedback operation for UL MU," Kiseon Ryu (LG Electronics)
 - [11-18-0185](#), "CR of CID 11001," Zhou Lan (Broadcom)
- Spatial Reuse (SR) - 3 submissions
 - [11-17-1852](#), "CR for 27.9," Laurent Cariou (Intel)
 - [11-18-0026](#), "CR SRG and SRP," Matthew Fischer (Broadcom Ltd.)
 - [11-18-0105](#), "LB230 CR Spatial Reuse," Yongho Seok (MediaTek)

3. Timeline update

TG reviewed the timeline - No change.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Draft 3.0 and WG Letter Ballot
July 2018	Mandatory Draft Review
February 2019	Formation of Sponsor Ballot pool
May 2019	Initial Sponsor Ballot
December 2019	RevCom submittal

Goals for the March 2018 session

- Continue with comment resolution on draft D2.0.

Teleconferences

TGax teleconferences are scheduled after the January 2018 session as follows:

Thursday	January 25 th , 2018	20:00 - 22:00 (ET)
Thursday	February 1 st , 2018	10:00 - 12:00 (ET)
Thursday	February 8 th , 2018	20:00 - 22:00 (ET)
Thursday	February 22 nd , 2018	20:00 - 22:00 (ET)

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November 2017 — Orlando, FL

TGax had four sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
			TGax	

AM1			(full)	
AM2		TGax (full)		TGax (full)
PM1	TGax (full)			
PM2		TGax (cancelled)	TGax (cancelled)	TGax (cancelled)
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-17-1546-04](#), TGax November 2017 Meeting Agenda
 - [11-17-1727-00](#), TGax November 2017 Orlando Meeting Minutes
 - [11-17-1789-00](#), TGax November 2017 Closing Report

WG Letter Ballot #230 on IEEE 802.11ax draft 2.0

- Ballot opened on Oct. 5th, 2017 and closed on Nov. 4th, 2017 (30 days).
- Failed with 62.84% approval.
- 3374 comments are collected.

Achievements

1. Work Completed

- The TG almost completed the assignment of comments received on draft D2.0.
 - A lead is identified for various clauses of the draft. The lead is responsible for coordinating resolutions of relevant CIDs.
- The TG approved resolutions to 36 CIDs.
- The TG updated its timeline to reflect the outcome of WG LB #230
- The TG passed a motion to hold an ad hoc meeting in San Diego during the period of January 10 - 12, 2018.

2. Technical Presentations

TGax received 12 submissions. All of the submissions are presented during the week.

- [11-17-1682](#), "Comments on TGax D2.0," Robert Stacy (Intel)
- [11-17-1687](#), "TGax Editor's Report," Robert Stacy (Intel)
- [11-17-1717](#), "Associated Congestion Avoidance Method Based on Dynamic Adjustment of Beacon Interval," Hongyan Li (Xidian Univ.)
- [11-17-1719](#), "Contention Based UL-OFDMA Random Access without back-off," Hongyan Li (Xidian Univ.)
- [11-17-1723](#), "TPC combined with channel allocation method for OBSS environment," Hongyan Li (Xidian Univ.)
- [11-17-1730](#), "PHY CID 17890 Resolution," Hongyuan Zhang (Marvell)
- [11-17-1731](#), "PHY CID 17895 Resolution," Hongyuan Zhang (Marvell)
- [11-17-1763](#), "CRs for 20 MHz-only STA - RU Restriction," Sungeun Lee (Cypress)
- [11-17-1764](#), "CRs for 28.4.2 and 28.4.4," Sungeun Lee (Cypress)
- [11-17-1766](#), "D2.0 Comment Resolution for CIDs on MLME SAP (Clause 6)," Jae Seung Lee (ETRI)
- [11-17-1769](#), "Discussion on Dynamic Fragmentation Level 3," Huizhao Wang (Quantenna Communications)
- [11-17-1774](#), "Resolution for the TBD in Annex C.3," Edward Au (Huawei Technologies)
- [11-17-1775](#), "CR for PICS comments on D2.0 - Part 1," Edward Au (Huawei Technologies)

3. Timeline update

TG reviewed the timeline. No change was made.

Previous Timeline		Modified (new) Timeline	
May 2014	Start of TG	May 2014	Start of TG
November 2014	First draft of the TG SFD approved	November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft	January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started	March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017	November 2016	Issue Draft 1.0 and start WG Letter Ballot — Failed (57.77%) LB 225: opened Dec. 1 st , 2016 and closed Jan. 8 th , 2017
September 2017	Draft 2.0 and WG Letter Ballot LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017	September 2017	Draft 2.0 and WG Letter Ballot — Failed (62.84%) LB 230: opened Oct. 5 th , 2017 and closed Nov. 4 th , 2017
May 2018	Mandatory Draft Review	May 2018	Draft 3.0 and WG Letter Ballot
May 2018	Formation of Sponsor Ballot pool	July 2018	Mandatory Draft Review
November 2018	Initial Sponsor Ballot	February 2019	Formation of Sponsor Ballot pool
July 2019	RevCom submittal	May 2019	Initial Sponsor Ballot
		December 2019	RevCom submittal

Goals for the January 2018 session

- Continue with comment resolution on draft D2.0.

Teleconferences

TGax teleconferences are scheduled after the November 2017 session as follows:

Thursday	November 30 th , 2017	10:00 - 12:00 (ET)
Thursday	December 7 th , 2017	20:00 - 22:00 (ET)
Thursday	December 14 th , 2017	10:00 - 12:00 (ET)
Thursday	December 21 st , 2017	20:00 - 22:00 (ET)
Thursday	January 4 th , 2018	10:00 - 12:00 (ET)
Thursday	January 25 th , 2018	20:00 - 22:00 (ET)

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September 2017 — Waikoloa, Big Island, HI

TGax had 11 sessions during the week.

Seven out of eleven sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2	TGax (full)	TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1			TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM2	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM3	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (MU ad hoc) TGax (MAC ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-17-1219-06](#), TGax September 2017 Meeting Agenda
 - [11-17-1465-00](#), TGax September 2017 Waikoloa Meeting Minutes
 - [11-17-1515-00](#), TGax September 2017 Closing Report
 - TGax PHY ad hoc group
 - [11-17-1434-03](#), TGax Sep 2017 Meeting PHY Ad Hoc Agenda
 - [11-17-1531-00](#), IEEE 802.11 TGax September 2017 Hawaii PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-17-1453-04](#), TGax MAC Ad-hoc September 2017 Meeting Agenda
 - [11-17-1543-00](#), IEEE 802.11 TGax, MAC Ad hoc, September 2017 TGax Meeting Minutes
 - TGax MU ad hoc group
 - [11-17-1487-01](#), TGax September 2017 Meeting MU ad-hoc Agenda
 - [11-17-1491-02](#), IEEE 802.11 TGax, MU ad hoc, September 2017 TGax Meeting Minutes

Achievements

1. Work Completed

- The TG completed the comment resolution on comments received during WG LB225 on draft D1.0.
- The TG approved a motion to prepare draft D2.0 and start a WG LB.
- Motion passed to affirm the applicability of the IEEE P802.11ax CSD to the modified PAR.

2. Technical Presentations

Following documents are discussed during the TGax teleconferences and the ad hoc meeting after July 2017 session.

- [11-17-0389](#), "CIDs-for-27-2-1-part1," Kaiying Lv (ZTE)
- [11-17-0553](#), "LB225 11ax D1.0 Comment Resolution 27.10.4 Part 1," Liwen Chu (Marvell)
- [11-17-0777](#), "CR TWT IE," Matthew Fischer (Broadcom)
- [11-17-0811](#), "Comment Resolution on TIM Broadcast," Jarkko Knecht (Apple)
- [11-17-0925](#), "CR on HE Duration-based RTS," Huizhao Wang (Quantenna)
- [11-17-1009](#), "Quiet time period - part 3 (27.26.3.x)," Chao-Chun Wang (MediaTek)
- [11-17-1010](#), "Quiet time period - part 4 (9.4.2.223-225)," Chao-Chun Wang (MediaTek)
- [11-17-1011](#), "Quiet time period - part 5 (9.6.29.x)," Chao-Chun Wang (MediaTek)

- [11-17-1034](#), "Quiet time period - part 6," Chao-Chun Wang (MediaTek)
- [11-17-1067](#), "LB225 11ax D1.0 Comment Resolution OMI and Operation Mode," Liwen Chu (Marvell)
- [11-17-1068](#), "LB225 11ax D1.0 Comment Resolution 10.7," Liwen Chu (Marvell)
- [11-17-1072](#), "Remaining OMI comment resolutions," Jarkko Knecht (Apple)
- [11-17-1082](#), "Comment resolutions for BRP and BSRP trigger frames," Menzo Wentink (Qualcomm)
- [11-17-1135](#), "CR QOS SF," Matthew Fischer (Broadcom)
- [11-17-1173](#), "Proposed Resolutions to CID 5011, 6900, 6998, and 9056," Osama Aboul-Magd (Huawei Technologies)
- [11-17-1174](#), "Clauses 3.2, 3.3, and 3.4 Comment Resolutions," Osama Aboul-Magd (Huawei Technologies)
- [11-17-1183](#), "CR for CID 5772, 9476, 9480," Po-Kai Huang (Intel)
- [11-17-1220](#), "Clause 10.2 Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
- [11-17-1248](#), "Clause 27.1 Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
- [11-17-1263](#), "Misc for HE Ops IE," Alfred Asterjadhi (Qualcomm)
- [11-17-1267](#), "LB225 11ax D1.0 Comment Resolution 27.10.2, 27.10.3," Liwen Chu (Marvell)
- [11-17-1268](#), "Clause 4.3.14a Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
- [11-17-1270](#), "LB225 CR 10.22.2.11 CID 5374," Yongho Seok (MediaTek) Need more discussion
- [11-17-1271](#), "LB225 CR 9.7.3 CID 9389," Yongho Seok (MediaTek)
- [11-17-1272](#), "LB225 CR 10.3.2.10.3 CID 9429," Yongho Seok (MediaTek)
- [11-17-1275](#), "CIDs related to TF," Abhishek Patil (Qualcomm)
- [11-17-1276](#), "CIDs related to Random Access," Abhishek Patil (Qualcomm)
- [11-17-1277](#), "Pending CIDs in 27.16," Abhishek Patil (Qualcomm)
- [11-17-1278](#), "Proposed Resolution for CID 9846," Abhishek Patil (Qualcomm)
- [11-17-1279](#), "Various CIDs in Clause 9," Abhishek Patil (Qualcomm)
- [11-17-1283](#), "CR for 10.5 MPDU Fragmentation," Woojin Ahn (WILUS)
- [11-17-1313](#), "LB225 CR CID 8538 9377," Yongho Seok (MediaTek)
- [11-17-1317](#), "CR for 10.3.2.10," Kiseon Ryu (LG Electronics)
- [11-17-1335](#), "CR for 27.3.1," Laurent Cariou (Intel)
- [11-17-1336](#), "CR for 9.4.2.240," Laurent Cariou (Intel)
- [11-17-1342](#), "PHY CR 8348 6433," Alfred Asterjadhi (Qualcomm)
- [11-17-1351](#), "CR on 27.14.2," Jeongki Kim (LG Electronics)
- [11-17-1362](#), "CIDs on Subclause 27.3.3 Part 2," Ming Gan (Huawei Technologies)
- [11-17-1363](#), "CIDs on Subclause 27.3.3 Part 3," Ming Gan (Huawei Technologies)

TGax received 62 submissions. All of the submissions are presented during the week.

- **PHY** — 21 submissions
 - [11-17-0995](#), "Doppler Comment Resolution," Hongyuan Zhang (Marvell)
 - [11-17-1001](#), "Comment Resolutions on Clause 28.2.2 (TXVECTOR and RXVECTOR parameters) Part 1," Bo Sun (ZTE)
 - [11-17-1296](#), "Comment Resolutions on Miscellaneous Comments," Lochan Verma (Qualcomm)
 - [11-17-1306](#), "CRs on Clause 28.3.3.2," Xiaogang Chen (Intel)
 - [11-17-1307](#), "Changes for the Tx/Rx Vectors related to HE TB NDP feedback," Xiaogang Chen (Intel)
 - [11-17-1315](#), "Comment Resolution to CID8576," Yujin Noh (Newracom)
 - [11-17-1320](#), "\$N_{SYM}\$ and \$T_{PE}\$ at RX side for Midamble design - Follow up," Yujin Noh (Newracom)
 - [11-17-1324](#), "Usage of Doppler bit in A-Control subfield," Yujin Noh (Newracom)
 - [11-17-1325](#), "Text Proposal on Usage of Doppler bit in A-Control subfield," Yujin Noh (Newracom)
 - [11-17-1327](#), "Interleaver for HE-SIGA and HE-SIGB," Dongguk Lim (LG Electronics)
 - [11-17-1332](#), "Comment Resolutions on Clause 28.3.3.4 (Pilot subcarriers)," Junghoon Suh (Huawei Technologies)
 - [11-17-1350](#), "On TX EVM," Ron Porat (Broadcom)
 - [11-17-1357](#), "Capability on Doppler Mode," Ross jian Yu (Huawei Technologies)
 - [11-17-1361](#), "CRs for 20 MHz-only STA - Part 4," Sungeun Lee (Cypress)
 - [11-17-1366](#), "Midamble Design Continued," Yang Zhang (Marvell)
 - [11-17-1374](#), "On Amplitude Drift Compensation," Jianhan Liu (MediaTek)

- [11-17-1375](#), "Text Changes on Transmitter modulation accuracy (EVM) test," Jianhan Liu (MediaTek)
- [11-17-1376](#), "Usage of Doppler Bit in 11ax," Jianhan Liu (MediaTek)
- [11-17-1380](#), "HE SIG-B Spatial Configuration Field Fixing," Hongyuan Zhang (Marvell)
- [11-17-1381](#), "DCM in HE TB PPDU," Yan Zhang (Marvell)
- [11-17-1383](#), "Proposed Change to the Resolution to CID 9551," Yasuhiko Inoue (NTT)
- **MAC** — 37 submissions
 - [11-17-0307](#), "HE BSS Load Information Element," Frank Hsu (MediaTek)
 - [11-17-0308](#), "HE BSS Load Information Element for 11ax," Frank Hsu (MediaTek)
 - [11-17-0619](#), "Proposed Text Changes for Client Management," Eldad Perahia (HPE-Aruba)
 - [11-17-0719](#), "Unifying QoS Control and BSR A-Control for Buffer Status Report," Zhou Lan (Broadcom)
 - [11-17-0765](#), "Follow UP of Unifying Queue Size Report," Zhou Lan (Broadcom)
 - [11-17-1054](#), "LB225 CR 27.13 (Link Adaptation)," Frank Hsu (MediaTek)
 - [11-17-1069](#), "LB225 11ax D1.0 Comment Resolution 9.7.3," Liwen Chu (Marvell)
 - [11-17-1081](#), "Comment Resolutions for HE NDP Announcement frame," Menzo Wentink (Qualcomm)
 - [11-17-1087](#), "MAC CR CIDs 4813-4814," Alfred Asterjadhi (Qualcomm)
 - [11-17-1138](#), "CR TWT Operation," Matthew Fischer (Broadcom)
 - [11-17-1244](#), "BSS Basic HE-MCS per Bandwidth," Matthew Fischer (Broadcom)
 - [11-17-1258](#), "Resolution to CID9863," Yujin Noh (Newracom)
 - [11-17-1262](#), "Miscellaneous for HE sounding," Alfred Asterjadhi (Qualcomm)
 - [11-17-1264](#), "Misc for Trigger frame format," Alfred Asterjadhi (Qualcomm)
 - [11-17-1280](#), "visio file for figure 27.12," Abhishek Patil (Qualcomm)
 - [11-17-1282](#), "LB225 11ax D1.0 Comment Resolution 27.11.1, 27.11.2," Liwen Chu (Marvell)
 - [11-17-1285](#), "LB225 11ax D1.0 Comment Resolution HE MAC Capabilities," Liwen Chu (Marvell)
 - [11-17-1290](#), "LB225 11ax D1.0 Comment Resolution HE PHY Capabilities, PPE," Liwen Chu (Marvell)
 - [11-17-1294](#), "LB225 11ax D1.0 Comment Resolution 10.7 Remaining CIDs," Liwen Chu (Marvell)
 - [11-17-1295](#), "Proposed Resolution for CID 9501," Guoqing Li (Apple)
 - [11-17-1299](#), "CID 10276 related to 27.5.5," Laurent Cariou (Intel)
 - [11-17-1301](#), "11ax D1.4 MAC Comment Resolution for CID 9636, 9699," Po-Kai Huang (Intel)
 - [11-17-1304](#), "LB225 11ax D1.0 Comment Resolution on Clause 10.9 HT Control Field," James Yee (MediaTek)
 - [11-17-1330](#), "CIDs: Acknowledgment related comments," George Cherian (Qualcomm)
 - [11-17-1337](#), "CR for CID5859 and CID 5971," Jarkko Knecht (Apple)
 - [11-17-1338](#), "TWT SP initiation and termination and legacy PS," Jarkko Knecht (Apple)
 - [11-17-1339](#), "Improvement to TWT Parameter set," Jarkko Knecht (Apple)
 - 11-17-1341, "PHY CR 8348 6433," Alfred Asterjadhi (Qualcomm) -- not available
 - [11-17-1346](#), "Individual constrained TWT agreements," jarkkoKnecht (Apple)
 - 11-17-1364, "CIDs on Subclause 27.3.3 Part 3," Ming Gan (Huawei Technologies) -- not available
 - 11-17-1365, "CIDs on Subclause 27.3.3 Part 3," Ming Gan (Huawei Technologies) -- not available
 - [11-17-1377](#), "11ax D1.0 MAC Comment Resolution for 27.13 and 9.4.2.218.2," Frank Hsu (MediaTek)
 - [11-17-1399](#), "Resolution for CID 3099," Edward Au (Huawei Technologies)
 - [11-17-1401](#), "Resolution for CIDs 5285, 6198, 7603," Edward Au (Huawei Technologies)
 - [11-17-1402](#), "Resolution for PICS," Edward Au (Huawei Technologies)
 - [11-17-1429](#), "Annex G Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
 - [11-17-1456](#), "Resolution for CID 8555," Abhishek Patil (Qualcomm)
- **MU** — 4 submissions
 - [11-17-1060](#), "CR on CID 6053," Jeongki Kim (LG Electronics)
 - [11-17-1091](#), "Proposed resolution for comments related to CIDs in 27.5.2," Jing Ma
 - [11-17-1139](#), "Comment Resolution on retransmission of OFDMA random access," Jing Ma (NICT)
 - [11-17-1286](#), "CR DL MU procedure," Zhou Lan (Broadcom)

3. Timeline discussion

TG reviewed the timeline. No change was made.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot
September 2017	Draft 2.0 and WG Letter Ballot
May 2018	Mandatory Draft Review
May 2018	Formation of Sponsor Ballot pool
November 2018	Initial Sponsor Ballot
July 2019	RevCom submittal

Goals for the November 2017 session

- Start and complete comment assignment.
- Start comment resolution on draft D2.0.

Teleconferences

TGax teleconferences are scheduled after the September 2017 session as follows:

Approved in July	Thursday	September 28 th , 2017	10:00 - 12:00 (ET)
	Thursday	September 21 st , 2017	20:00 - 22:00 (ET)
New!	Thursday	November 2 nd , 2017	10:00 - 12:00 (ET)

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July 2017 — Berlin, Germany

TGax originally planned 10 sessions during the week.

One ad hoc session was added during the WG mid-week plenary.

Seven out of eleven sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	TGax (MAC ad hoc)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
	TGax		TGax TGax	TGax

PM1	(full)			(PHY ad hoc)	(MAC ad hoc)	(full)
PM2	TGax (PHY ad hoc)	TGax (MAC ad hoc)	TGax (MU/SR ad hoc)	TGax (MAC ad hoc)	TGax (PHY ad hoc)	TGax (full)
PM3			TGax (PHY ad hoc)	TGax (MAC ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-17-0887-06](#), TGax July 2017 Meeting Agenda
 - [11-17-1105-00](#), TGax July 2017 Berlin Meeting Minutes
 - [11-17-1158-00](#), TGax July 2017 Closing Report
 - TGax PHY ad hoc group
 - [11-17-1099-04](#), TGax Jul 2017 Meeting PHY Ad Hoc Agenda
 - [11-17-1094-00](#), TGax July 2017 Berlin PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-17-1098-03](#), TGax MAC Ad-hoc July 2017 Meeting Agenda
 - [11-17-1154-00](#), July 2017 TGax MAC Ad hoc Meeting Minutes
 - TGax MU & SR ad hoc group
 - [11-17-1116-01](#), TGax July 2017 Meeting MU & SR ad-hoc Agenda
 - [11-17-1148-00](#), TGax MU and SR ad hoc group meeting minutes — Berlin, July 2017

Achievements

1. Work Completed

- Continued with the comment resolution on draft D1.0.
 - Resolutions of about 480 comments were approved.
 - The TG Editor is planning to produce draft D1.4 based on the resolved comments.
- Discussed options and need for volunmrees for the .
- Motin passswd to extend 802.11ax scope to include frequency bands up to 7.125 GHz
- Ad hoc meeting is planned for September in the Bay area.

2. Technical Presentations

TGax received 48 submissions. All of the submissions are presented during the week.

- **PHY** — 21 submissions
 - [11-17-0650](#), "LB 225 — Clause 18.2 Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
 - [11-17-0902](#), "Comment Resolutions on Clause 28 (HE PHY) Part 1," Lochan Verma (Qualcomm)
 - [11-17-0945](#), "CRs on 28.3.3.8," Yujin Noh (Newracom)
 - [11-17-0946](#), "Text modification on HE-SIG-B," Yujin Noh (Newracom)
 - [11-17-0960](#), "Follow-up on Doppler Design in 802.11ax," Lochan Verma (Qualcomm)
 - [11-17-0961](#), "Miscellaneous clarifications On HE PHY Part 1," Lochan Verma (Qualcomm)
 - [11-17-0973](#), "TGax D1.0 Comment Resolutions on 28.3.3.10 and 28.3.3.2," Jinsoo Choi (LG Electronics)
 - [11-17-0985](#), "CRs for the HE TB NDP feedback," Xiaogang Chen (Intel)
 - [11-17-0986](#), "CRs for the HE Trigger-based NDP feedback," Xiaogang Chen (Intel)
 - [11-17-0993](#), "11ax Comment Resolutions on Data Field," Yang Zhang (Marvell)
 - [11-17-0994](#), "Midamble Design," Hongyuan Zhang (Marvell)

- [11-17-0995](#), "Doppler Comment Resolution," Hongyuan Zhang (Marvell)
- [11-17-0996](#), "Update on Timing Related Constants and Some Equations," Bin Tian (Qualcomm)
- [11-17-0998](#), " N_{SYM} and T_{PE} at RX side for Midamble design," Yujin Noh (Newracom)
- [11-17-1001](#), "Comment Resolutions on Clause 28.2.2 (TXVECTOR and RXVECTOR parameters) Part 1," Bo Sun (ZTE)
- [11-17-1006](#), "Miscellaneous HE-SIG-B related CIDs," Sigurd Schelstraete (Quantenna)
- [11-17-1007](#), "Proposed resolution for CID 9021," Sigurd Schelstraete (Quantenna)
- [11-17-1016](#), "Improvement Comment on Clause 28.3.3.4 (Pilot subcarriers)," Jung Hoon Suh (Huawei Technologies)
- [11-17-1021](#), "Usage of Doppler Bit in 11ax," Jianhan Liu (MediaTek)
- [11-17-1050](#), "Additional Editorial Update Related to CID 9769," Youhan Kim (Qualcomm)
- [11-17-1063](#), "DCM Text Correction," Tianyu Wu (MediaTek)
- **MAC** — 28 submissions
 - [11-17-0389](#), "Proposed resolution for CIDs for 27-2-1," Kaiying Lv (ZTE)
 - [11-17-0533](#), "LB225 CR Sub-clause 27.16.1," Yongho Seok (Newracom)
 - [11-17-0553](#), "LB225 11ax D1.0 Comment Resolution 27.10.4 Part 1," Liwen Chu (Marvell)
 - [11-17-0693](#), "11ax D1.0 MAC Comment Resolution for Quiet Time Period Part 1," Chao-Chun Wang (MediaTek)
 - [11-17-0759](#), "Comment Resolution on trigger frame for random access," Jason Yuchen Guo (Huawei Technologies)
 - [11-17-0812](#), "Trigger Frame for Random Access," Jason Yuchen Guo (Huawei Technologies)
 - [11-17-0925](#), "LB225 11ax D1.0 Comment Resolution 10.3.x," Huizhao Wang (Quantenna)
 - [11-17-0926](#), "CR HE MCS NSS Not Supported," Matthew Fischer (Broadcom Limited)
 - [11-17-0957](#), "Comment resolution for Fragmentation," Suhwook Kim (LG Electronics)
 - [11-17-1002](#), "Comment resolution for HCF," Suhwook Kim (LG Electronics)
 - [11-17-1009](#), "11ax D1.0 MAC Comment Resolution for Quiet Time Period Part 3," Chao-Chun Wang (MediaTek)
 - [11-17-1010](#), "11ax D1.0 MAC Comment Resolution for Quiet Time Period Part 4," Chao-Chun Wang (MediaTek)
 - [11-17-1011](#), "11ax D1.0 MAC Comment Resolution for Quiet Time Period Part 5," Chao-Chun Wang (MediaTek)
 - [11-17-1014](#), "Resolution for CIDs on Association Exchange with DL MU," Stephane Baron (Canon Research)
 - [11-17-1023](#), "LB225 CR Sub-clause 27.11.3," Yongho Seok (Newracom)
 - [11-17-1031](#), "CR for remaining CIDs related to 27.5.5," Laurent Cariou (Intel)
 - [11-17-1032](#), "Proposed resolution for comments in 27.5.2," Abhishek Patil (Qualcomm)
 - [11-17-1034](#), "11ax D1.0 MAC Comment Resolution for Quiet Time Period Part 6," Chao-Chun Wang (MediaTek)
 - [11-17-1044](#), "CIDs: Acknowledgment related comments," George Cherian (Qualcomm)
 - [11-17-1046](#), "Proposed Resolution to CID 7043," Kaiying Lv (ZTE)
 - 11-17-1049, "Target RSSI field," Laurent Cariou (Intel) — *Not on the server*
 - [11-17-1052](#), "HE MCS and NSS Comment resolutions," Alfred Asterjadhi (Qualcomm)
 - [11-17-1053](#), "Comment resolutions for remaining CIDs in OM Control," Alfred Asterjadhi (Qualcomm)
 - [11-17-1054](#), "LB225 CR 27.13 (Link Adaptation)," Frank Hsu (MediaTek)
 - 11-17-1055, "LB225 CR CID 7407," Yongho Seok (Newracom) — *Not on the server*
 - [11-17-1060](#), "CR on CID 6053," Jeongki Kim (LG Electronics)
 - [11-17-1062](#), "Proposed resolution for CID 9958," Abhishek Patil (Qualcomm)
 - [11-17-1067](#), "LB225 11ax D1.0 Comment Resolution OMI and Operation Mode," Liwen Chu (Marvell)
 - [11-17-1068](#), "LB225 11ax D1.0 Comment Resolution 10.7," Liwen Chu (Marvell)
 - 11-17-1069, "LB225 11ax D1.0 Comment Resolution 9.7.3," Liwen Chu (Marvell) — *Not on the server*
 - [11-17-1070](#), "Resolution for CID 5863," Kiseon Ryu (LG Electronics)
 - [11-17-1072](#), "OMI comment resolutions," Jarkko Knecht (Apple)
 - [11-17-1077](#), "11ax D1.3 MAC Comment Resolution for 10.3.2.4 and 27.2.2 Part III," Po-Kai Huang (Intel)
 - [11-17-1081](#), "11ax D1.0 MAC Comment Resolution for 9.3.1.20," Menzo Wentink (Qualcomm)
 - [11-17-1082](#), "11ax D1.0 MAC Comment Resolution for 9.3.1.23.2/5," Menzo Wentink (Qualcomm)
 - [11-17-1087](#), "MAC-CR-CIDs 4813-4814," Alfred Asterjadhi (Qualcomm)
 - [11-17-1088](#), "Editorial fixes," Alfred Asterjadhi (Qualcomm)
 - 11-17-1091, "Proposed resolution for comments related to CIDs in 27.5.2," Jing Ma (NICT) — *Not on the server*

- **SR** — 3 submissions
 - [11-17-0669](#), "Proposed resolution for CID 4928," Kaiying Lv (ZTE)
 - [11-17-0941](#), "CR for 27.9 spatial reuse," Laurent Cariou (Intel)
 - [11-17-1003](#), "Text DSC, CCAT and OBSS_PD to Resolve SR Comments," Graham Smith (SRT Wireless)
- **MU** — 3 submissions
 - [11-17-0935](#), "Comment resolution for UL OFDMA-based random access (UORA)," Patrice Nezou (Canon Research)
 - [11-17-1059](#), "CR on 27.5.2.6.2 Part 3," Jeongki Kim (LG Electronics)
 - [11-17-1071](#), "Resolution for CID 6106, 9571, 10173," Kiseon Ryu (LG Electronics)
- **Others (covered in the TGax full sessions)** — 7 submissions
 - [11-17-0308](#), "BSS Load Information Element for 11ax," Frank Hsu (MediaTek)
 - [11-17-0711](#), "Comment Resolution on PHY-CCA.indication," Rojan Chitrakar (Panasonic)
 - [11-17-0913](#), "P802.11ax PAR Modification to support 6 GHz band," Richard Kennedy (HPE)
 - [11-17-0933](#), "P802.11ax PAR Modification," Richard Kennedy (HPE)
 - [11-17-1058](#), "Proposed resolution for comments related to Section 4.3.14a," Guoqing Li (Apple)
 - [11-17-1066](#), "CR on UL OFDMA in DFS Channels," Youhan Kim (Qualcomm)
 - [11-17-1080](#), "Providing Reference Waveform Generator For 11ax PHY Specification," Fei Tong (Samsung)

3. Timeline discussion

TG discussed the timeline. No change was made.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot
September 2017	Draft 2.0 and WG Letter Ballot
May 2018	Mandatory Draft Review
May 2018	Formation of Sponsor Ballot pool
November 2018	Initial Sponsor Ballot
July 2019	RevCom submittal

Goals for the September 2017 session

- Continue with the resolution of comments on draft D1.0.
- Prepare draft D2.0 and plan for WG letter ballot.

Teleconferences

TGax teleconferences are scheduled after the July 2017 session as follows:

Thursday	July 20 th , 2017	10:00 - 12:00 (ET)
Thursday	July 27 th , 2017	20:00 - 22:00 (ET)

Thursday	August 3 rd , 2017 August 17 th , 2017 August 31 st , 2017	10:00 - 12:00 (ET)
Thursday	August 10 th , 2017 August 24 th , 2017	10:00 - 12:00 (ET)
Thursday	September 21 st , 2017	20:00 - 22:00 (ET)
Thursday	September 28 th , 2017	10:00 - 12:00 (ET)

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May 2017 — Daejeon, South Korea

TGax had 11 sessions during the week.

Six out of eleven sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2	TGax (full)	TGax (full)		
PM1			TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM2	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (SR ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hocs) TGax (MAC ad hoc)	TGax (full)
PM3	TGax (PHY ad hocs) TGax (MAC ad hoc)	TGax (SR ad hocs) TGax (MAC ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-17-0555-05](#), TGax May 2017 Meeting Agenda
 - [11-17-0749-00](#), IEEE 802.11 TGax May 2017 Deajeon Meeting Minutes
 - [11-17-0832-00](#), TGax May 2017 Closing Report
 - TGax PHY ad hoc group
 - [11-17-0783-02](#), TGax May 2017 Meeting PHY Ad Hoc Agenda
 - [11-17-0850-00](#), IEEE 802.11 TGax May 2017 PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-17-0786-02](#), TGax MAC Ad-hoc May 2017 Meeting Agenda
 - [11-17-0829-00](#), May 2017 TGax MAC Ad hoc Meeting Minutes
 - TGax MU ad hoc group
 - Submissions for the MU ad hoc was presented in the MAC ad hoc session.
 - TGax SR ad hoc group

- [11-17-0797-02](#), TGax Spatial Reuse Ad Hoc Group May 2017 Meeting Agenda
 - [11-17-0817-00](#), Minutes of the May 2017 meetings of the Spatial Reuse ad hoc group of IEEE Task Group AX (TGax)
-

Achievements

1. Work Completed

- Continued with the comment resolution on draft D1.0.
 - Good progress during the ad hoc meeting and this meeting.
 - Resolutions of over 900 comments were approved.
 - The TG Editor is planning to produce draft D1.3 based on the resolved comments.
- Discussed the need to produce a reference waveform generator similar to that for HT and VHT \$151 looking for volunteers.
- No ad hoc meeting is planned for June/July.
 - Increase the frequency of the teleconferences during the week of June 26.

2. Technical Presentations

TGax received 48 submissions. All of the submissions are presented during the week.

- **PHY** — 19 submissions
 - [11-17-0044](#), "NDP Feedback Report Design," Ron Porat (Broadcom Limited)
 - [11-17-0232](#), "CR_clause 28.3.6," Xiaogang Chen (Intel)
 - [11-17-0233](#), "CR_4905," Xiaogang Chen (Intel)
 - [11-17-0288](#), "CRs on HE-SIG-B 28.3.10.8.4-5 part 1," Yujin Noh (Newracom)
 - [11-17-0289](#), "CRs on HE-SIG-B terminologies on 28.3.10.8.1-3," Yujin Noh (Newracom)
 - [11-17-0290](#), "CRs on TX specification," Yujin Noh (Newracom)
 - [11-17-0465](#), "CR on TXTIME and PSDU_LENGTH," Youhan Kim (Qualcomm)
 - [11-17-0648](#), "CR on HE-SIG-A," Ron Porat (Broadcom Limited)
 - [11-17-0650](#), "LB 225 - Clause 18.2 Comment Resolution," Osama Aboul-Magd (Huawei Technologies)
 - [11-17-0678](#), "Discussion of CID 9021," Sigurd Schelstraete (Quantenna Communications)
 - [11-17-0690](#), "CRs on 28.3.10.7.3," Yujin Noh (Newracom)
 - [11-17-0694](#), "CRs for packet extension in 28.3.12," Sungeun Lee (Cypress)
 - [11-17-0698](#), "CRs on Miscellaneous PHY CIDs," Bin Tian (Qualcomm)
 - [11-17-0714](#), "CSD update for 28.3.6," Dongguk Lim (LG Electronics)
 - [11-17-0734](#), "Doppler Discussions," Hongyuan Zhang (Marvell)
 - [11-17-0736](#), "HE Link Adaptation," Xiaogang Chen (Intel)
 - [11-17-0769](#), "CRs for 20MHz-only STA - Part 3," Sungeun Lee (Cypress)
 - [11-17-0773](#), "Thoughts on Doppler Design in 802.11ax," Lochan Verma (Qualcomm)
 - [11-17-0774](#), "CID 8975 resolution," Hongyuan Zhang (Marvell)
- **MAC** — 28 submissions
 - [11-17-0073](#), "CR for 27.5.2.7 NDP feedback report," Laurent Cariou (Intel)
 - [11-17-0088](#), "Discussion for CR on 10.22.2.8 TXOP limits," Woojin Ahn (Wilus)
 - [11-17-0340](#), "CR for 11-1-3-10," Yonggang Fang (ZTE)
 - [11-17-0360](#), "LB225 CR for Subclause 27.3.3-Part 1," Ming Gan (Huawei Technologies)
 - [11-17-0389](#), "CIDs-for-27-2-1-part1," Kaiying Lv (ZTE)
 - [11-17-0553](#), "LB225 11ax D1.0 Comment Resolution 27.10.4 Part 1," Liwen Chu (Marvell)
 - [11-17-0576](#), "Resolutions for Comments related to Extended Range Beacon," Tomoko Adachi (Toshiba)
 - [11-17-0581](#), "LB225-MAC-CR-Miscellaneous," Alfred Asterjadhi (Qualcomm)
 - [11-17-0586](#), "LB225-cr-mac_miscellaneous_part2," Yongho Seok (Newracom)
 - [11-17-0602](#), "Misc 27_12," Alfred Asterjadhi (Qualcomm)
 - [11-17-0603](#), "Misc 27_15," Alfred Asterjadhi (Qualcomm)
 - [11-17-0604](#), "Misc RDP Control," Alfred Asterjadhi (Qualcomm)
 - [11-17-0607](#), "LB225-MAC-CR-Misc BSR Control," Alfred Asterjadhi (Qualcomm)

- [11-17-0621](#), "CRs for Section 27.4 - part 2," George Cherian (Qualcomm)
- [11-17-0677](#), "CRs for Section 9.3.1.9 block ack - part 2," George Cherian (Qualcomm)
- [11-17-0688](#), "LB225 11ax D1.0 Comment Resolution 27.10.4 - Part II," Chittabrata Ghosh (Intel)
- [11-17-0702](#), "CR for CID 9574," Kaiying Lv (ZTE)
- [11-17-0727](#), "LB225 MAC CR for Clause 10-9," James Yee (MediaTek)
- [11-17-0729](#), "CR for CID 7250, 7251 and 7252," Kiseon Ryu (LG Electronics)
- [11-17-0730](#), "CR for CID 7255," Kiseon Ryu (LG Electronics)
- [11-17-0733](#), "Comment Resolution on TIM broadcast," Jason Yuchen Guo (Huawei Technologies)
- [11-17-0735](#), "CR to CID4850 and CID8153 on TWT," Jarkko Kneckt (Apple)
- [11-17-0744](#), "CR for 10.3.2.4 and 27.2.2 Part II," Po-Kai Huang (Intel)
- [11-17-0759](#), "Comment Resolution on CID 9333 and 9969," Jason Yuchen Guo (Huawei Technologies)
- [11-17-0765](#), "Follow up unify queue size report," Zhou Lan (Broadcom Limited)
- [11-17-0766](#), "Spec text unify queue size report," Zhou Lan (Broadcom Limited)
- [11-17-0775](#), "Non-HT definition," Matthew Fischer (Broadcom Limited)
- [11-17-0777](#), "CR TWT IE," Matthew Fischer (Broadcom Limited)
- **MU** — 1 submissions
 - [11-17-0751](#), "Comment Resolution on retransmission of OFDMA random access," Yunbo Li (Huawei Technologies)
- **SR** — 5 submissions
 - [11-17-0633](#), "CR 27.9 spatial reuse updates," Matthew Fischer (Broadcom Limited)
 - [11-17-0640](#), "CR 27.2 SRG updates," Matthew Fischer (Broadcom Limited)
 - [11-17-0669](#), "CR for CID 4928," Kaiying Lv (ZTE)
 - [11-17-0724](#), "LBS2 various," Matthew Fischer (Broadcom Limited)
 - [11-17-0748](#), "Supplementary instructions related to OBSS_PD spatial reuse Disallow / Prohibit," Sean Coffey (RealTek)
- **Others (covered in the TGax full sessions)** — 10 submissions
 - [11-17-0112](#), "Link Transmit Power," Matthew Fischer (Broadcom Limited)
 - [11-17-0123](#), "Link Transmit Power text," Matthew Fischer (Broadcom Limited)
 - [11-17-0308](#), "BSS Load Information Element for 11ax," Frank Hsu (MediaTek)
 - [11-17-0336](#), "CR for CID 8555 - Virtual CS during UL MU CS," Rojan Chitrakar (Panasonic)
 - [11-17-0337](#), "Explanation of CR for CID 8555," Rojan Chitrakar (Panasonic)
 - [11-17-0361](#), "BSS Load Information in 802.11ax," Ming Gan (Huawei Technologies)
 - [11-17-0582](#), "OBSS_PD/TPC Examined," Graham Smith (SR Technologies)
 - [11-17-0665](#), "Proposed Resolutions to CID 6901 and 7690," Osama Aboul-Magd (Huawei Technologies)
 - [11-17-0707](#), "CR for CID 8555," Po-Kai Huang (Intel)
 - [11-17-0711](#), "CR for PHY-CCA.indication," Rojan Chitrakar (Panasonic)

3. Timeline discussion

TG discussed and updated the timeline.

Current Timeline		Modified Timeline	
May 2014	Start of TG	May 2014	Start of TG
November 2014	First draft of the TG SFD approved	November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft	January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started	March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot	November 2016	Issue Draft 1.0 and start WG Letter Ballot
September 2017	Draft 2.0 and WG Recirculation Ballot	September 2017	Draft 2.0 and WG Letter Ballot
May 2018	Mandatory Draft Review	May 2018	Mandatory Draft Review
May 2018	Formation of Sponsor Ballot pool	May 2018	Formation of Sponsor Ballot pool

November 2018	Initial Sponsor Ballot	November 2018	Initial Sponsor Ballot
July 2019	RevCom submittal	July 2019	RevCom submittal

Goals for the July 2017 session

- Continue with the resolution of comments on draft D1.0.

Teleconferences

TGax teleconferences are scheduled after the May 2017 session as follows:

Thursday	May 18 th , 2017	20:00 - 22:00 (ET)
Thursday	May 25 th , 2017	10:00 - 12:00 (ET)
Thursday	June 1 st , 2017 June 15 th , 2017	20:00 - 22:00 (ET)
Thursday	June 8 th , 2017 June 22 nd , 2017	10:00 - 12:00 (ET)
Monday	June 26 th , 2017	20:00 - 22:00 (ET)
Tuesday	June 27 th , 2017	10:00 - 12:00 (ET)
Wednesday	June 28 th , 2017	20:00 - 22:00 (ET)
Thursday	June 29 th , 2017	10:00 - 12:00 (ET)
Thursday	July 20 th , 2017	10:00 - 12:00 (ET)

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March 2017 — Vancouver, BC, Canada

TGax had 10 sessions during the week.

Six out of ten sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (full)		TGax (MAC ad hoc) TGax (PHY ad hoc)	TGax (full)
PM2	TGax (MAC ad hoc) TGax (PHY ad hoc)	TGax (MAC ad hoc) TGax (PHY ad hoc)	TGax (MU/PHY ad hocs) TGax (MAC ad hoc)	TGax (full)
PM3		TGax (MAC ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-17-0199-06](#), TGax March 2017 Meeting Agenda
 - [11-17-0454-00](#), IEEE 802.11 TGax March 2017 Vancouver Meeting Minutes
 - [11-17-0512-00](#), TGax March 2017 Closing Report
 - TGax PHY ad hoc group
 - [11-17-0464-02](#), TGax Ad Hoc PHY Session Mar 2017 Pre-Meeting Agenda
 - [11-17-0494-00](#), IEEE 802.11 TGax January 2017 Atlanta PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-17-0453-05](#), TGax MAC Ad-hoc March 2017 Meeting Agenda
 - [11-17-0155-01](#), March 2017 TGax MAC Ad hoc Meeting Minutes
 - TGax MU ad hoc group
 - [11-17-0485-01](#), TGax MU Ad Hoc Agenda - March 2017
 - [11-17-0495-00](#), March 2017 TGax MU Ad hoc Meeting Minutes
 - TGax SR ad hoc group
 - [11-17-0482-01](#), TGax SR Ad-hoc March 2017 Meeting Agenda
 - [11-17-0504-00](#), Spatial Reuse ad hoc group March 2017 minutes

Achievements

1. Work Completed

- Continued with the comment resolution on draft D1.0.
 - Very good progress during the ad hoc meeting and this meeting.
 - The TG Editor is planning to generate a new revision of the TG draft (D1.2) and a new revision of the status of the comment resolution.
- Spatial Reuse issues were discussed at length.
 - Some progress on spatial reuse.
- Agreed to hold an ad hoc meeting in Seoul, Korea, May 3-5.
 - PHY ad hoc meeting will be only for one day, Friday May 5.

2. Technical Presentations

TGax received 48 submissions. All of the submissions are presented during the week.

- **PHY** — 11 submissions
 - [11-17-0044](#), "NDP Feedback Report Design," Ron Porat (Broadcom)
 - [11-17-0078](#), "RBW of 11ax," Xiaogang Chen (Intel)
 - [11-17-0231](#), "CR_clause 28.3.5," Xiaogang Chen (Intel)
 - [11-17-0234](#), "CR_clause 28.3.19_28.3.20," Xiaogang Chen (Intel)
 - [11-17-0247](#), "CR HE PHY Introduction Part 4," Lochan Verma (Qualcomm)
 - [11-17-0261](#), "CR HE PHY Transmit Requirements HE_TRIG_PPDU Part 1," Lochan Verma (Qualcomm)
 - [11-17-0290](#), "CRs on TX specification," Yujin Noh (Newracom)
 - [11-17-0345](#), "LB225 CR on TXOP_DURATION (28.2.2)," Jeongki Kim (LG Electronics)
 - [11-17-0398](#), "11ax Comment Resolutions for HE Preamble," Yan Zhang (Marvell)
 - [11-17-0400](#), "CRs for 20MHz-only STA - Part 1," Sungeun Lee (Cypress)
 - [11-17-0404](#), "CR on Pre-HE preamble transmission for trigger based PPDU," Ross Jian Yu (Huawei)
 - [11-17-0414](#), "CR on clause 28-3-11 HE PHY data field," Tianyu Wu (MediaTek)

- [11-17-0436](#), "LB225 Comment Resolution of CID 7517," Jianhan Liu (MediaTek)
- **MAC** — 25 submissions
 - [11-17-0074](#), "Explanations for CR on 27.5.2.7," Laurent Cariou (Intel)
 - [11-17-0088](#), "Discussion for CR on 10.22.2.8 TXOP limits," Woojin Ahn (Wilus)
 - [11-17-0239](#), "LB225-MAC-CR-HT Control subclause 9.2.4.6.X and 10.1 - Block 2," Alfred Asterjadhi (Qualcomm)
 - [11-17-0240](#), "LB225-MAC-CR-HT Control subclause 9.2.4.6.X and 10.1 - Block 3," Alfred Asterjadhi (Qualcomm)
 - [11-17-0283](#), "lb225-mac-cr-9-3-1-23," Raja Banerjea (Qualcomm)
 - [11-17-0285](#) (not available), "LB225-MAC-CR-HE MCS_NSS resolutions," Alfred Asterjadhi (Qualcomm)
 - [11-17-0308](#), "CR for section 9.4.2 BSS load PPT," Frank Hsu (MediaTek)
 - [11-17-0319](#), "CR for Section 27.4," George Cherian (Qualcomm)
 - [11-17-0341](#), "LB225 11ax D1.0 Comment Resolution 10.13," Liwen Chu (Marvell)
 - [11-17-0344](#), "LB225 CR on EIFS and TXOP_DURATION (10.3.2.3.7 and 27.11.5)," Jeongki Kim (LG Electronics)
 - [11-17-0346](#), "LB225 CR on TXOP Truncation (10.22.2.9)," Jeongki Kim (LG Electronics)
 - [11-17-0347](#), "LB225 CR on Intra-PPDU PS (27.14.1)," Jeongki Kim (LG Electronics)
 - [11-17-0353](#), "LB225-CRs-on-OFDMA-based-random-access-Response," Suhwook Kim (LG Electronics)
 - [11-17-0359](#), "Comment resolution for CS Required subfield," Raja Banerjea (Qualcomm)
 - [11-17-0360](#), "LB225 CR for CID5917 and CID8165," Ming Gan (Huawei)
 - [11-17-0361](#), "BSS Load Information in 802.11ax," Ming Gan (Huawei)
 - [11-17-0362](#), "LB225 CR for Subclause 9.4.2.218.2," Ming Gan (Huawei)
 - [11-17-0384](#), "LB225, Comment resolution for 10.24.10," Reza Hedayat (Newracom)
 - [11-17-0389](#), "CIDs-for-27-2-1-part1," Kaiying Lv (ZTE)
 - [11-17-0395](#), "LB225-CR-on-Pre-association," Ming Gan (Huawei)
 - [11-17-0396](#), "Association Exchange using Contention based UL OFDMA," Ming Gan (Huawei)
 - [11-17-0421](#), "cr-for-11.49-HE BSS operation," Chao-Chun Wang (MediaTek)
 - [11-17-0443](#), "LB225-CRs-on-OFDMA-based-random-access-Figure," Suhwook Kim (LG Electronics)
 - [11-17-0445](#), "CR on Per-TID All Ack in Multi-STA BlockAck Frame," Geonjung Ko (Wilus)
 - [11-17-0448](#), "Proposed resolution for comments related to CIDs in 27.5.2," Jing Ma (NICT)
- **MU** — 9 submissions
 - [11-17-0271](#), "CR for 17.2.2.1 and 17.3.9.10," Po-kai Huang (Intel)
 - [11-17-0282](#), "11-17-xxxx-0x-00ax-lb225-mac-cr-number-of-ss-9-3-1-23," Raja Banerjea (Qualcomm)
 - [11-17-0302](#), "D1.0 MAC Resolution CR for 27.5.2.4," Po-Kai Huang (Intel)
 - [11-17-0325](#), "CR for 27.14.3 OPS," Laurent Cariou (Intel)
 - [11-17-0335](#), "CR for CID 8142 - Random Access acronym," Rojan Chitrakar (Panasonic)
 - [11-17-0338](#), "CR for 27.5.2.4 - Physical CS CIDs," Rojan Chitrakar (Panasonic)
 - [11-17-0349](#), "LB225 CR for 25.5.2.4 Setting of CS Required Bit," Kiseon Ryu (LG Electronics)
 - [11-17-0403](#), "CR-Subclause-27-5-3-MU-Cascading," David Xun Yang (Huawei)
 - [11-17-0442](#), "LB225, CR CIDs 3215, 3216," Reza Hedayat (Newracom)
- **SR** — 10 submissions
 - [11-16-1063](#), "Unified SR text DSC, ATPC, inter-BSS," Graham Smith (SR Technologies)
 - [11-16-1476](#), "CR-for section-25-9-spatial-reuse-operation-for-HE-PPDU," Matthew Fischer (Broadcom)
 - [11-17-0075](#), "SRP-based SR Summary and Update," Matthew Fischer (Broadcom)
 - [11-17-0163](#), "DSC as OBSS_PD," Graham Smith (SR Technologies)
 - [11-17-0267](#), "CR for 25.9.2.2 OBSS_PD Spatial reuse," Laurent Cariou (Intel)
 - [11-17-0383](#), "Spatial Reuse Group Challenges," Reza Hedayat (Newracom)
 - [11-17-0452](#), "LB225, CR for CID3222," Reza Hedayat (Newracom)
 - [11-17-0455](#), "Some clarifications on current SR spec text," Laurent Cariou (Intel)
 - [11-17-0458](#), "OBSS_PD: Threshold problems," Sean Coffey (RealTek)
 - [11-17-0459](#) (not available), Kaiying Lv (ZTE)
- **Others (covered in the TGax full sessions)** — 5 submissions

- [11-17-0112](#), "Link Transmit Power," Matthew Fischer (Broadcom)
- [11-17-0328](#), "Link Adaptation Feedback for Combating Interference," Feng Jiang (InterDigital)
- [11-17-0334](#), "Proposed Text for Simulation Scenarios," Frank Hsu (MediaTek)
- [11-17-0369](#), "Some CIDs related to 20MHz operation," Guoqing Li (Apple)
- [11-17-0370](#), "Some CIDs related to 20MHz operation -- text," Guoqing Li (Apple)

3. Timeline discussion

TG discussed and updated the timeline.

Current Timeline		Modified Timeline	
May 2014	Start of TG	May 2014	Start of TG
November 2014	First draft of the TG SFD approved	November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft	January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and Comment Collection started	March 2016	Draft 0.1 was approved and Comment Collection started
November 2016	Issue Draft 1.0 and start WG Letter Ballot	November 2016	Issue Draft 1.0 and start WG Letter Ballot
May 2017	Draft 2.0 and WG recirculation ballot	September 2017	Draft 2.0 and WG recirculation ballot
November 2017	Mandatory Draft Review	May 2018	Mandatory Draft Review
January 2018	Formation of Sponsor Ballot pool	May 2018	Formation of Sponsor Ballot pool
March 2018	Initial Sponsor Ballot	November 2018	Initial Sponsor Ballot
December 2018	RevCom submittal	July 2019	RevCom submittal

Goals for the May 2017 session

- Continue with the resolution of comments on draft D1.0.

Teleconferences

TGax teleconferences are scheduled after the March 2017 session as follows:

Thursday	March 23 rd , 2017	20:00 - 22:00 (ET)
Thursday	March 30 th , 2017	10:00 - 12:00 (ET)
Thursday	April 6 th , 2017	20:00 - 22:00 (ET)
Thursday	April 13 th , 2017	10:00 - 12:00 (ET)
Thursday	April 20 th , 2017	20:00 - 22:00 (ET)
Thursday	April 27 th , 2017	10:00 - 12:00 (ET)
Thursday	May 18 th , 2017	20:00 - 22:00 (ET)
Thursday	May 25 th , 2017	10:00 - 12:00 (ET)

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January 2017 — Atlanta, GA

TGax had 9 sessions during the week.

Three out of nine sessions were the ad hoc sessions of PHY and MAC ad hocs.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2	TGax (full)	TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1			TGax (full)	TGax (full)
PM2	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)	TGax (full)
PM3				

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-16-1587-05](#), TGax January 2017 Meeting Agenda
 - [11-17-0126-00](#), IEEE 802.11 TGax January 2017 Atlanta Meeting Minutes
 - [11-17-0179-00](#), TGax January 2017 Closing Report
 - TGax PHY ad hoc group
 - [11-17-0127-03](#), TGax PHY Ad Hoc Jan 2017 Meeting Agenda
 - IEEE 802.11 TGax January 2017 Atlanta PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-17-0128-02](#), TGax MAC Ad Hoc January 2017 Meeting Agenda
 - [11-17-0155-00](#), IEEE 802.11 TGax, MAC Ad hoc January 2017 TGax MAC Ad hoc Meeting Minutes

Achievements

1. Work Completed

- The working group letter ballot #225 on the IEEE 802.11ax draft 1.0 was conducted from December 1st, 2016 to January 8th, 2017.
- The 802.11ax draft 1.0 did *NOT* meet the requirement of $\geq 75\%$ approval ratio.
- Over 7300 comments received.
 - About 4700 out of 7300 comments are technical and general comments.
 - Assignment of comments is completed during the first session of the week.
- The TG started discussing resolutions of comments submitted on draft D1.0.
 - Approximately 200 comments are resolved.
- Spatial Reuse issues were discussed at length.
 - Slow progress on SRP-based SR.
- Proposal to include simplified simulation models in the TG simulation scenarios document was discussed and passed straw poll.

- Agreed to hold an ad hoc meeting in San Diego, from March 8th to 10th, 2017.
- Vacant positions of ad hoc co-chairs are filled.

MAC	PHY	Multi-User (MU)	Spatial Reuse (SR)
Eric Wong (Apple)	Bo Sun (ZTE)	Sigurd Schelstraete (Quantenna)	Laurent Cariou (Orange)
Reza Hedayat (Newracom)	Jianhan Liu (MediaTek)	Kiseon Ryu (LG Electronics)	Guido R. Hiertz (Ericsson)
" open " → Chao-Chun Wang (MediaTek)	Hongyuan Zhang (Marvell)	" open " → David Xun Yang (Huawei)	Jae Seung Lee (ETRI)

2. Technical Presentations

TGax received 48 submissions. All of the submissions are presented during the week.

- **PHY** — 11 submissions
 - [11-17-0044](#), "NDP Feedback Report Design," Ron Porat (Broadcom)
 - [11-17-0047](#), "lb225-cr-28_4_3," Yongho Seok (Newracom)
 - [11-17-0056](#), "CR HE PHY Capabilities_Part_1," Lochan Verma (Qualcomm)
 - [11-17-0060](#), "comment resolution for the CCA of preamble puncturing," Yunbo Li (Huawei)
 - [11-17-0072](#), "CID 6124 Resolution: Remove 2x LTF+08.us GI for UL Transmission," Jianhan Liu (MediaTek)
 - [11-17-0077](#), "Proposed changes to Draft 1.0," Xiaogang Chen (Intel)
 - [11-17-0078](#), "RBW of 11ax," Xiaogang Chen (Intel)
 - [11-17-0110](#), "Discussions on Signaling for UL HE MU PPDU," John Son (Wilus)
 - [11-17-0112](#), "Link Transmit Power," Matthew Fischer (Broadcom)
 - [11-17-0113](#), "Steering Vector Sanctity," Matthew Fischer (Broadcom)
 - [11-17-0114](#), "CID-Trigger frame_Part-1," Lochan Verma (Qualcomm)
- **MAC** — 14 submissions
 - [11-17-0037](#), "Comment resolution for clause 10.28," Jarkko Knecht (Apple)
 - [11-17-0045](#), "lb225-cr-27_11_4," Yongho Seok (Newracom)
 - [11-17-0046](#), "lb225-cr-27_6_4," Yongho Seok (Newracom)
 - [11-17-0073](#), "CR for 27.5.2.7 NDP feedback report," Laurent Cariou (Intel)
 - [11-17-0074](#), "Explanations for CR on 27.5.2.7," Laurent Cariou (Intel)
 - [11-17-0082](#), "comment resolution for subclause 11.2.2.8," Kaiying Lv (ZTE)
 - [11-17-0085](#), "CR for 9.2.5.2 and 9.2.5.7," Po-Kai Huang (Intel)
 - [11-17-0088](#), "CR on 10.22.2.8 TXOP limits," Woojin Ahn (Wilus)
 - [11-17-0089](#), "Discussion for CR on 10.22.2.8 TXOP limits," Woojin Ahn (Wilus)
 - [11-17-0104](#), "Discussion on CR for CID 5066," Dengyu Qiao (Huawei)
 - [11-17-0115](#), "Comment resolution to clause 27.8," Jarkko Knecht (Apple)
 - [11-17-0116](#), "TWT Schedule Bitmap," Matthew Fischer (Broadcom)
 - [11-17-0117](#), "Broadcast TWT TIM," Matthew Fischer (Broadcom)
 - [11-17-0118](#), "Mandated Response MCS," Matthew Fischer (Broadcom)
- **Others (covered in the TGax full sessions)** — 13 submissions
 - [11-16-0947](#), "Proposed text changes for OBSS_PD-based SR parameters," Matthew Fischer (Broadcom)
 - [11-16-1063](#), "Unified SR text DSC, ATPC, inter-BSS," Graham Smith (SR Technologies)
 - [11-16-1363](#), "PAR Verification Through OFDMA," Suhwook Kim (LG Electronics)
 - [11-16-1476](#), "CR-for section-25-9-spatial-reuse-operation-for-HE-PPDU," Matthew Fischer (Broadcom)
 - [11-16-1567](#), "Proposal for DSC, ATPC, Inter-BSS with Responses to Comments," Graham Smith (SR Technologies)
 - [11-17-0032](#), "Proposal on Simulation Scenario Document for 11ax PAR verification," Suhwook Kim (LG Electronics)
 - [11-17-0075](#), "SRP-based SR Summary and Update," James Wang (MediaTek)
 - [11-17-0076](#), "Multiple BSS Simulations for PAR Verification," Frank Hsu (MediaTek)

- [11-17-0081](#), "consideration of spatial reuse," Kaiying Lv (ZTE)
- [11-17-0090](#), "11ax PAR Verification using UL MU-MIMO," Narendar Madhavan (Toshiba)
- [11-17-0095](#), "Proposal on Simulation Scenario Document for 11ax PAR verification(doc)," Suhwook Kim (LG Electronics)
- [11-17-0099](#), "Additional background for CID 8908," Sigurd Schelstraete (Quantenna)
- [11-17-0102](#), "LB225 comments on Spatial Reuse," Sean Coffey (RealTek)

Goals for the March 2017 session

- Continue with the resolution of comments on draft D1.0.

Teleconferences

TGax teleconferences are scheduled after the January 2017 session as follows:

Thursday	February 2 nd , 2017	10:00 - 12:00 (ET)
Thursday	February 16 th , 2017	20:00 - 22:00 (ET)
Thursday	February 23 rd , 2017	10:00 - 12:00 (ET)
Thursday	March 2 nd , 2017	20:00 - 22:00 (ET)
Thursday	March 23 rd , 2017	20:00 - 22:00 (ET)
Thursday	March 30 th , 2017	10:00 - 12:00 (ET)
Thursday	April 6 th , 2017	20:00 - 22:00 (ET)

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November 2016 — San Antonio, TX

TGax had 12 sessions during the week.

Six out of twelve sessions were the ad hoc sessions.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full, ad hoc)		TGax (full)	TGax (full)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (full)		TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM2	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (MU ad hoc) TGax (SR ad hoc)	TGax (MU ad hoc) TGax (MAC ad hoc)	TGax (full)
PM3	TGax (MU ad hoc) TGax (SR ad hoc)			

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-16-1310-05](#), TGax November 2016 Meeting Agenda
 - [11-16-1466-01](#), IEEE 802.11 TGax November 2016 San Antonio Meeting Minutes
 - [11-16-1546-00](#), TGax November 2016 Closing Report
 - TGax PHY ad hoc group
 - [11-16-1475-03](#), TGax PHY Ad Hoc Nov 2016 Meeting Agenda
 - [11-16-1530-00](#), November 2016 San Antonio PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-16-1478-02](#), TGax MAC Ad Hoc November 2016 Meeting Agenda
 - [11-16-1480-01](#), November 2016 TGax MAC Ad hoc Meeting Minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-16-1487-01](#), TGax MU Ad-hoc Agenda November 2016
 - [11-16-1520-00](#), IEEE 802.11 TGax, MU Ad hoc September 2016 TGax Meeting Minutes
 - TGax Spatial Reuse (SR) ad hoc group
 - [11-16-1481-02](#), 802.11ax Spatial Reuse Ad Hoc Group Agenda
 - [11-16-1569-00](#), TGax Spatial Reuse ad hoc group meeting minutes - San Antonio, November 2016

Achievements

1. Work Completed

- The TG completed the discussion of all the submissions received.
- Completed resolution of most of the comments received on draft D0.1.
- Passed a motion to prepare draft D1.0 and start 30-day WG LB.

2. Technical Presentations

TG received 90 submissions which are classified into PHY, MAC, MU, SR and TG submimssions.

- **PHY** — 29 submissions
 - [11-16-1295](#), "CC23 PHY CR Miscellaneous Part-1," Yongho Seok (Newracom)
 - [11-16-1340](#), "CR HE-PHY Miscellaneous Part-3," Lochan Verma (Qualcomm)
 - [11-16-1341](#), "CR HE-PHY-Introduction-Part-2," Lochan Verma (Qualcomm)
 - [11-16-1356](#), "Spec text for HE NDP," Yongho Seok (Newracom)
 - [11-16-1370](#), "Proposed Spec Text for CCA Section," Laurent Cariou (Intel)
 - [11-16-1371](#), "CR HE-SIG-B part III," Ross Jian Yu (Huawei)
 - [11-16-1372](#), "Some proposed changes to D0.5," Ross Jian Yu (Huawei)
 - [11-16-1374](#), "Resolution on CID495 and Removal of Unnecessary PHY TBDs," Yujin Noh (Newracom)
 - [11-16-1375](#), "Comment Resolution for CID2867 and Text Change Proposal of 26.3.10.8 HE-SIG-B," Yujin Noh (Newracom)
 - [11-16-1377](#), "Comment resolution on Clauses 26.3.9 and 26.3.10," Yusuke Asai (NTT)
 - [11-16-1387](#), "Comment resolution on CID2506 and proposed changes," Jinsoo Chio (LG Electronics)
 - [11-16-1393](#), "EVM Definition for UL OFDMA," Ron Porat (Broadcom)
 - [11-16-1398](#), "CR for CID 2077," Sriram Venkateswaran (Broadcom)
 - [11-16-1399](#), "Changes to D0.5," Sriram Venkateswaran (Broadcom)
 - [11-16-1402](#), "11ax Receiver Specification," Bin Tian (Qualcomm)
 - [11-16-1406](#), "Spec Text for 11ax Receiver Requirements," Bin Tian (Qualcomm)
 - [11-16-1407](#), "Changes to D0.5," Xiaogang Chen (Intel)

- [11-16-1408](#), "PHY CRs 26.3.3,26.3.18,26.3.19," Xiaogang Chen (Intel)
- [11-16-1410](#), "Clause 26 Fixes," Hongyuan Zhang (Marvell)
- [11-16-1411](#), "TXTIME and RXTIME Fixes," Hongyuan Zhang (Marvell)
- [11-16-1421](#), "Smoothness Recommendation for 4x HE-LTF," Feng Jiang (Intel)
- [11-16-1427](#), "Remove TBDs in PHY Transmit Spec.," Yujin Noh (Newracom)
- [11-16-1434](#), "Miscellaneous HE PHY corrections," Lochan Verma (Qualcomm)
- [11-16-1437](#), "Updated Text for DCM," Jianhan Liu (MediaTek)
- [11-16-1438](#), "0.8us GI with 4x HE LTF," Jianhan Liu (MediaTek)
- [11-16-1439](#), "Error correction to D0.5_on Beam-change text," Jianhan Liu (MediaTek)
- [11-16-1443](#), "Spec text: Smoothness Recommendation for HE-LTF," Feng Jiang (Intel)
- [11-16-1448](#), "Remaining CR on section-26-2-2 TXRXVECTOR Parameters," Ke Yao (ZTE)
- [11-16-1449](#), "Proposed Text Changes to TXRXVECTOR in Clause 26.2.2," Ke Yao (ZTE)
- **MAC** — 36 submissions
 - [11-16-1238](#), "Setting Quiet time period - text," Chao-Chun Wang (MediaTek)
 - [11-16-1352](#), "CC23 MAC CR Miscellaneous Part-1," Yongho Seok (Newracom)
 - [11-16-1354](#), "CC23 CR Annex C," Yongho Seok (Newracom)
 - [11-16-1355](#), "Spec text for 10.22.2.5 and 3.2," Yongho Seok (Newracom)
 - [11-16-1358](#), "CC0-Remaining CIDs on BA," Alfred Asterjadhi (Qualcomm)
 - [11-16-1359](#), "CC0-Some remaining CIDs related to TWT," Alfred Asterjadhi (Qualcomm)
 - [11-16-1360](#), "CC0-HE variant HT control - Some Remaining CIDs," Alfred Asterjadhi (Qualcomm)
 - [11-16-1362](#), "CC0-Complete RTS Enablement," Alfred Asterjadhi (Qualcomm)
 - [11-16-1367](#), "NDP feedback report," Laurent Cariou (Intel)
 - [11-16-1368](#), "Follow-up on MU EDCA parameters," Laurent Cariou (Intel)
 - [11-16-1380](#), "Proposed text changes for TWT in congested environment," Laurent Cariou (Intel)
 - [11-16-1381](#), "Proposed text changes for fragmentation operation," Laurent Cariou (Intel)
 - [11-16-1404](#), "Early TWT SP Termination in TWT Operation," Jayh hyunhee Park (LG Electronics)
 - [11-16-1409](#), "A-MSDU Fragmentation," Matthew Fischer (Broadcom)
 - [11-16-1413](#), "CID 193 BSS Color Disabled Indication," Abhishek Patil (Qualcomm)
 - [11-16-1415](#), "CID 72 BSS Color change mechanism," Abhishek Patil (Qualcomm)
 - [11-16-1416](#), "CC0-HE BSS operation11-16-xxxx-00-00ax-CC0-HE BSS operation," Alfred Asterjadhi (Qualcomm)
 - [11-16-1417](#), "CC0-HE BSS operation," Alfred Asterjadhi (Qualcomm)
 - [11-16-1418](#), "CC0-HE Multirate Support and 2G4 40MHz HE STA," Alfred Asterjadhi (Qualcomm)
 - [11-16-1419](#), "MCS_NSS_BW_PPDU_Selection_for_11ax," Alfred Asterjadhi (Qualcomm)
 - [11-16-1420](#), "TWT Information frames in 11ax," Alfred Asterjadhi (Qualcomm)
 - [11-16-1423](#), "NAV Update Rule Considering UL MU Operation," Geonjung Ko (WILUS)
 - [11-16-1424](#), "Issue on the CWmax value in MU EDCA," Woojin Ahn (WILUS)
 - [11-16-1425](#), "Clarification on applying MU EDCA parameter set," Woojin Ahn (WILUS)
 - [11-16-1431](#), "IEEE 802.11ax Annex G," Osama Aboul-Magd (Huawei Technologies)
 - [11-16-1442](#), "Spec texts for section 25.4 BA," Jeongki Kim (LG Electronics)
 - [11-16-1452](#), "Multiple BSSID and MU," Liwen Chu (Marvell)
 - [11-16-1453](#), "A-MPDU content," Liwen Chu (Marvell)
 - [11-16-1454](#), "Multiple BSSID and MU Discussion," Liwen Chu (Marvell)
 - [11-16-1456](#), "A-MPDU content discussion," Liwen Chu (Marvell)
 - [11-16-1458](#), "Comment Resolution for Sub-clause 25.13.2," Chittabrata Ghosh (Intel)
 - [11-16-1459](#), "Considerations on Quiet Time Period," Jinsoo Ahn (Yonsei Univ.)
 - [11-16-1461](#), "MU BAR comment resolutions," Reza Hedayat (Newracom)
 - [11-16-1464](#), "RD Protocol," Jarkko Knecht (Apple)
 - [11-16-1468](#), "A-MPDU Content Capabilities," Raja Banerjee (Qualcomm)
 - [11-16-1477](#), "CC23 Proposed Resolution (Update for) TWT Element," Matthew Fischer (Broadcom)

- **Multi-User (MU)** — 12 submissions
 - [11-16-1353](#), "CC23 MAC CR Miscellaneous Part-2," Yongho Seok (Newracom)
 - [11-16-1357](#), "CC0 Remaining CIDs on sounding," Alfred Asterjadhi (Qualcomm)
 - [11-16-1361](#), "CC0- Remaining CIDs on MU Operation," Alfred Asterjadhi (Qualcomm)
 - [11-16-1382](#), "MAC support of preamble puncture," Zhou Lan (Broadcom)
 - [11-16-1383](#), "Spec Text: MAC support of preamble puncture," Zhou Lan (Broadcom)
 - [11-16-1389](#), "Comment Resolution for CID 807," Po-Kai Huang (Intel)
 - [11-16-1390](#), "Spec Text: Revision for NAV Setting Rule under Immediate Response," Po-Kai Huang (Intel)
 - [11-16-1391](#), "Comment Resolution Random Access miscellaneous," Young Hoon Kwon (Newracom)
 - [11-16-1392](#), "Comment Resolution CID 2624 and 2738," Young Hoon Kwon (Newracom)
 - [11-16-1426](#), "DL/UL indication in MU-RTS," Woojin Ahn (WILUS)
 - [11-16-1441](#), "Consideration on Internal Contention Between Data and Trigger Frame," Jing Ma (NICT)
 - [11-16-1457](#), "11ax D0.1 Comment Resolution for Clause 25.5.3," David Xun Yang (Huawei)
- **Spatial Reuse (SR)** — 9 submissions
 - [11-16-0947](#), "Proposed text changes for OBSS_PD-based SR parameters," Matthew Fischer (Broadcom)
 - [11-16-1063](#), "Unified SR text DSC, ATPC, inter-BSS," Graham Smith (SR Technologies)
 - [11-16-1064](#), "Unified SR approach DSC, ATPC and Inter-BSS," Graham Smith (SR Technologies)
 - [11-16-1121](#), "Spec Texts: Spatial Reuse Indication for Trigger," Po-Kai Huang (Intel)
 - [11-16-1337](#), "CR on SR CCA rules clause 25.9," Bo Sum (ZTE)
 - [11-16-1403](#), "SR Backoff Procedure," Jayh Hyunhee Park (LG Electronics)
 - [11-16-1430](#), "Comment Resolution for SR on BSS Color," Junichi Iwatani (NTT)
 - [11-16-1440](#), "Proposed Resolutions to CID 2719," Jing Ma (NICT)
 - [11-16-1450](#), "CR for CID 2492 section 25.9 spatial reuse operation," Kaiying Lv (ZTE)
- **Others (covered in the TGax full sessions)** — 4 submissions
 - [11-16-0995](#), "Editor's report," Robert Stacy (Intel)
 - [11-16-1363](#), "11ax PAR Verification through OFDMA," Suhwook Kim (LG Electronics)
 - [11-16-1414](#), "Verifying 11ax 7fs PAR by UL MU-MIMO," Jason Yuchen Guo (Huawei)
 - [11-16-1435](#), "PAR Verification Simulation Followup," James Yee (MediaTek)

Timeline

TG discussed the timeline. No changes since last update.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG, SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and CC started
November 2016	Issue Draft 1.0 and start WG Letter Ballot
May 2017	Draft 2.0 and WG recirculation ballot
November 2017	Mandatory Draft Review
January 2018	Formation of Sponsor Ballot pool
March 2018	Initial Sponsor Ballot
December 2018	RevCom submittal

Goals for the January 2017 session

- Start Comment Resolutions on the IEEE 802.11ax draft D1.0.

Teleconferences

Weekly teleconferences are scheduled after the November 2016 session.

Thursday	December 1 st , 2016	21:00 - 23:00 (ET)
Thursday	December 8 th , 2016	21:00 - 23:00 (ET)
Thursday	December 15 th , 2016	21:00 - 23:00 (ET)
Tuesday	January 5 th , 2017	11:00 - 13:00 (ET)
Thursday	January 12 th , 2017	20:00 - 22:00 (ET)

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September 2016 — Warsaw, Poland

The TGax had 11 sessions during the week.

Six out of eleven sessions were assigned to the ad hoc group sessions.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2	TGax (full)	TGax (MU ad hoc) TGax (MAC ad hoc)		TGax (full)
PM1			TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM2	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (MU ad hoc) TGax (MAC ad hoc)	TGax (full)
PM3	TGax (PHY ad hoc) TGax (SR ad hoc)			

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and TGax closing report can be found here.

- TGax
 - [11-16-1077-06](#), TGax September 2016 Meeting Agenda
 - [11-16-1231-00](#), IEEE 802.11 TGax September 2016 Warsaw Meeting Minutes
 - [11-16-1284-00](#), TGax September 2016 Closing Report
 - TGax PHY ad hoc group
 - [11-16-1246-06](#), TGax PHY Ad Hoc Sep 2016 Meeting Agenda
 - [11-16-1276-00](#), IEEE 802.11 TGax September 2016 Warsaw PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group

- [11-16-1247-02](#), TGax MAC Ad Hoc September 2016 Meeting Agenda
- [11-16-1252-01](#), IEEE 802.11 TGax, MAC Ad hoc September 2016 Warsaw TGax MAC Ad hoc Meeting Minutes
- TGax Multi-User (MU) ad hoc group
 - [11-16-1244-01](#), TGax MU Ad-hoc Agenda September 2016
 - [11-16-1275-00](#), IEEE 802.11 TGax, MU Ad hoc September 2016 TGax Meeting Minutes
- TGax Spatial Reuse (SR) ad hoc group
 - [11-16-1245-02](#), TGax Spatial Reuse Ad-hoc Agenda September 2016 Meeting
 - [11-16-1300-00](#), TGax Spatial Reuse ad hoc group meeting minutes — Warsaw, September 2016

Achievements

1. Work Completed

- TG received 90 submissions.
 - Number of submissions: PHY/MAC/MU/SR/TG = 28/43/12/9/6.
The TG completed the discussion of all the submissions.
Exact count of resolved CIDs will be published by the Editor.
- The TG editor is planning to have draft revision D0.5 ready based on resolved comments.

2. Technical Presentations

TG received 90 submissions which are categorized into PHY, MAC, MU, SR and TG.

- **PHY** — 28 submissions
 - [11-16-1133](#), "11ax sounding modes reduction," Yan Zhang (Marvell)
 - [11-16-1134](#), "11ax spec text on sounding modes reduction," Yan Zhang (Marvell)
 - [11-16-1135](#), "11ax comment resolutions for clause 26.3.5," Yan Zhang (Marvell)
 - [11-16-1136](#), "11ax comment resolutions for clause 26.3.8," Yan Zhang (Marvell)
 - [11-16-1137](#), "11ax comment resolutions for clause 26.3.9," Yan Zhang (Marvell)
 - [11-16-1138](#), "11ax comment resolutions for clause 26.3.10," Yan Zhang (Marvell)
 - [11-16-1148](#), "CR HE-SIG-A part III," Ross Jian Yu (Huawei)
 - [11-16-1149](#), "CR HE-SIG-A part II," Ross Jian Yu (Huawei)
 - [11-16-1150](#), "CR Packet Extension part I," Ross Jian Yu (Huawei)
 - [11-16-1160](#), "Comment Resolution for CID 355," Eunsung Park (LG Electronics)
 - [11-16-1167](#), "UL MU Clarifications," Ron Porat (Broadcom)
 - [11-16-1168](#), "DCM TBDs," Sriram Venkateswaran (Broadcom)
 - [11-16-1169](#), "CR Duplicate MU MIMO," Sriram Venkateswaran (Broadcom)
 - [11-16-1170](#), "HE PHY Capabilities," Lochan Verma (Qualcomm)
 - [11-16-1171](#), "PHY Miscellaneous Part-1," Lochan Verma (Qualcomm)
 - [11-16-1176](#), "PHY CR Miscellaneous Part-2," Lochan Verma (Qualcomm)
 - [11-16-1179](#), "PHY section editorial comments on D0.4," Sungeun Lee (Cypress)
 - [11-16-1190](#), "Tx Quality Requirements," Daewon Lee (Newracom)
 - [11-16-1191](#), "Comment Resolution for CIDs on PHY Transmit Spec," Daewon Lee (Newracom)
 - [11-16-1192](#), "Comment Resolution for CID 1450," Daewon Lee (Newracom)
 - [11-16-1193](#), "HE variant HT Control - HE Link Adaptation," Daewon Lee (Newracom)
 - [11-16-1194](#), "Removal of Unnecessary PHY TBDs," Daewon Lee (Newracom)
 - [11-16-1202](#), "CR HE-LTF," Ming Gan (Huawei)
 - [11-16-1227](#), "cr-on-26-3-7," Shahnaz Azizi (Intel)
 - [11-16-1232](#), "Text change proposal of TXTIME in 26.3.19 and 26.4.3," Daewon Lee (Newracom)
 - [11-16-1233](#), "CR for DCM related CID 503, 504 and 2750," Daewon Lee (Newracom)
 - [11-16-1240](#), "Packet Extension Factor calculation fix," Yan Zhang (Marvell)
 - [11-16-1242](#), "spec text for packet extension factor calculation fix," Yan Zhang (Marvell)
- **MAC** — 43 submissions

- [11-16-0864](#), "Comment Resolutions on Clause 6 & 8 comments," Yasuhiko Inoue (NTT)
- [11-16-0869](#), "Misc. TWT comment resolution," Zhou Lan (Broadcom)
- [11-16-0881](#), "Comment resolution on ROMI," Jayh Park (LG Electronics)
- [11-16-0882](#), "Comment resolution on TOMI," Alfred Asterjadhi (Qualcomm)
- [11-16-0883](#), "Comment resolution for CID152," JayhPark (LG Electronics)
- [11-16-0884](#), "Spec. Text for HE Operation element and AID Assign Rule," Jianhan Liu (MediaTek)
- [11-16-0913](#), "SU Multi-TID Rules," Jarkko Kneckt (Apple)
- [11-16-0917](#), "Text for TID value of ALL ACK signaling," Woojin Ahn (WILUS)
- [11-16-0918](#), "Discussions on Partial BSS Color," Geonjung Ko (WILUS)
- [11-16-0924](#), "NAV resetting with RTS/MU-RTS," Weiming Xing (ZTE)
- [11-16-0925](#), "Spec text on NAV resetting with RTS/MU-RTS," Weiming Xing (ZTE)
- [11-16-0941](#), "CR HE Fragmentation - part 2," Ming Gan (Huawei)
- [11-16-0942](#), "CR Service Field," Ming Gan (Huawei)
- [11-16-0960](#), "AP access procedure for UL MU operation," Jinsoo Ahn (Yonsei Univ.)
- [11-16-0961](#), "Consideration on Multi-STA BlockAck Optimization," Hanseul Hong (Yonsei Univ.)
- [11-16-0962](#), "EDCA rules-follow up 1," Jing Ma (NICT)
- [11-16-0963](#), "EDCA rules-follow up 2," Jing Ma (NICT)
- [11-16-0998](#), "Rules for 2 EDCA parameters," Laurent Cariou (Intel)
- [11-16-1110](#), "Comment Resolution on subclause 10.22.2 and 10.22.4," Yongho Seok (Newracom)
- [11-16-1131](#), "Comment Resolution on MU Ack Policy," Yongho Seok (Newracom)
- [11-16-1154](#), "MAC CR for CID 966," Weiming Xing (ZTE)
- [11-16-1157](#), "Comment resolution on SU_MU ACK procedures," Jeongki Kim (LG Electronics)
- [11-16-1173](#), "Comment Resolution on Two NAVs - Part II," Po-Kai Huang (Intel)
- [11-16-1180](#), "Proposed text changes for MU EDCA parameters," Laurent Cariou (Intel)
- [11-16-1181](#), "CW value after UL MU procedure," Woojin Ahn (WILUS)
- [11-16-1182](#), "HE Sounding Feedback Segmentation," Liwen Chu (Marvell)
- [11-16-1183](#), "MU RTS CTS data rate comment," Liwen Chu (Marvell)
- [11-16-1184](#), "A-MPDU 25.10 25.10.2 comment resolution," Liwen Chu (Marvell)
- [11-16-1185](#), "A-MPDU 25.10.3 comment resolution," Liwen Chu (Marvell)
- [11-16-1186](#), "A-MPDU Content Comment Resolution," Liwen Chu (Marvell)
- [11-16-1188](#), "MAC Capabilities in HE Capabilities IE," Alfred Asterjadhi (Qualcomm)
- [11-16-1189](#), "CC0-TWT operation," Alfred Asterjadhi (Qualcomm)
- [11-16-1195](#), "MAC Clarifications," Alfred Asterjadhi (Qualcomm)
- [11-16-1204](#), "Intra-PPDU Power Save for a Multiple BSSID Set Case," Geonjung Ko (Wilus)
- [11-16-1205](#), "Text for Intra-PPDU Power Save for a Multiple BSSID Set Case," Geonjung Ko (Wilus)
- [11-16-1210](#), "Comment Resolution on MU acknowledgement procedure," Junichi Iwatani (NTT)
- [11-16-1211](#), "CR_CID_122_576_972_2598," Huizao Wang (Quantenna)
- [11-16-1213](#), "CR TWT and HE element related," Matthew Fischer (Broadcom)
- [11-16-1220](#), "MU mode EDCA control," Jinsoo Ahn (Yonsei Univ.)
- [11-16-1234](#), "Spec Text for TWT Protection field," Hanseul Hong (Yonsei Univ.)
- [11-16-1236](#), "Text for Partial BSS Color and AID Assignment Rule," Geonjung Ko (Wilus)
- [11-16-1237](#), "Setting Quiet Time Period," Chao-Chun Wang (MediaTek)
- [11-16-1238](#), "Setting Quiet Time Period - text," Chao-Chun Wang (MediaTek)
- **Multi-User (MU)** — 12 submissions
 - [11-16-0773](#), "Comment Resolution Section 25.6 HE Sounding," Raja Banerjea (Qualcomm)
 - [11-16-0929](#), "CR - UL MU Operation," Simone Merlin (Qualcomm)
 - [11-16-1152](#), "DL OFDMA Ack rule for uplink trigger based PPDU," Ming Gan (Huawei)
 - [11-16-1158](#), "Comment resolution on OFDMA random access procedure," Jeongki Kim (LG Electronics)
 - [11-16-1162](#), "Comment Resolution on Retransmission of OFDMA Random Access," Yunbo Li (Huawei)

- [11-16-1163](#), "Concluding OFDMA M-BA transmission," Zhou Lan (Broadcom)
- [11-16-1177](#), "comment-resolution-TXOP-truncation," Young Hoon Kwon (Newracom)
- [11-16-1199](#), "Proposed text changes for DL OFDMA Acknowledge rule for trigger based PPDU," Ming Gan (Huawei)
- [11-16-1222](#), "Comment Resolution on UL OFDMA Random Access," Chittabrata Ghosh (Intel)
- [11-16-1224](#), "Random Access Parameter Set (RAPS) element," Chittabrata Ghosh (Intel)
- [11-16-1239](#), "Trigger Frame MU BAR part 1," Raja Banerjee (Qualcomm)
- [11-16-1241](#), "Trigger Frame MU BAR part 2," Raja Banerjee (Qualcomm)
- **Spatial Reuse (SR)** — 9 submissions
 - [11-16-0945](#), "Clarification for OBSS_PD-based SR parameters," Matthew Fischer (Broadcom)
 - [11-16-0947](#), "Proposed text changes for OBSS_PD-based SR parameters," Laurent Cariou (Intel)
 - [11-16-1064](#), "Unified SR approach DSC, ATPC and Inter-BSS," Graham Smith (SR Technologies)
 - 11-16-1155, "SR Comment Resolution for CID994," Kaiying Lv (ZTE) - not available
 - [11-16-1161](#), "Simulation-based evaluation of OBSS_PD-based SR default parameters," Tanguy Ropitault (NIST)
 - [11-16-1178](#), "comment-resolution-SR-RSSI," Young Hoon Kwon (Newracom)
 - [11-16-1216](#), "SR Field SRP Table for HE-Trigger-Based PPDU," James Wang (MediaTek)
 - [11-16-1223](#), "CR for Section 25.9.2 OBSS_PD Spatial reuse," Laurent Cariou (Intel)
 - [11-16-1225](#), "Heads We Win, Tails We Don't Lose: Proposals for Dynamic CCA," Sean Coffey (RealTek)
- **Others (covered in the TGax full session)** — 6 submissions
 - [11-15-1095](#), "OFDMA performance in 11ax," Suhwook Kim (LG Electronics)
 - [11-16-1143](#), "11ax PAR Verification," Paul Cheng (MediaTek)
 - [11-16-1159](#), "Summary of Mandatory or Optional Features of 802.11ax," Joonsuk Kim (Apple)
 - [11-16-1166](#), "Meeting PAR requirements with UL OFDMA," Sriram Venkateswaran (Broadcom)
 - [11-16-1198](#), "Preliminary 11ax PAR Verification," Jiyong Pang (Huawei)
 - [11-16-1219](#), "Considerations on CR for 2665 and 2715," Jing Ma (NICT)

3. Timeline discussion

TG discussed and updated the timeline.

Current Timeline		Modified Timeline	
May 2014	Start of TG	May 2014	Start of TG
November 2014	First draft of the TG SFD approved	November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft	January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and CC started	March 2016	Draft 0.1 was approved and CC started
September 2016	Issue Draft 1.0 and start WG Letter Ballot	November 2016	Issue Draft 1.0 and start WG Letter Ballot
March 2017	Draft 2.0 and WG recirculation ballot	May 2017	Draft 2.0 and WG recirculation ballot
November 2017	Mandatory Draft Review and formation of Sponsor Ballot pool	January 2018	Mandatory Draft Review and formation of Sponsor Ballot pool
March 2018	Initial Sponsor Ballot	March 2018	Initial Sponsor Ballot
December 2018	RevCom submittal	December 2018	RevCom submittal

Goals for the November 2016 session

- Continue with comment resolutions.
- Prepare draft 1.0 and start WG letter ballot.

Teleconferences

TGax teleconferences are scheduled after the September 2016 session as follows.

Thursday	September 29 th , 2016	10:00 - 12:00 (ET)
Thursday	October 20 th and 27 th , 2016	10:00 - 12:00 (ET)
Thursday	October 30 th , 2016	20:00 - 22:00 (ET)
Thursday	November 17 th , 2016	10:00 - 12:00 (ET)

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July 2016 — San Diego, CA

The TGax had 11 sessions during the week.

Six out of eleven sessions were assigned to the ad hoc group sessions.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full, ad hoc)		TGax (full)	
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full)
PM1			TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM2	TGax (full)	TGax (MU ad hoc) TGax (SR ad hoc)	TGax (full)	
PM3		TGax (PHY ad hoc) TGax (MAC ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and TGax closing report can be found here.

- TGax
 - [11-16-0779-06](#), TGax July 2016 Meeting Agenda
 - [11-16-0967-00](#), IEEE 802.11 TGax July 2016 San Diego Meeting Minutes
 - [11-16-1051-00](#), TGax July 2016 Closing Report
 - TGax PHY ad hoc group
 - [11-16-1007-03](#), TGax PHY Ad Hoc July 2016 Meeting Agenda
 - [11-16-1040-00](#), IEEE 802.11 TGax July 2016 San Diego PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-16-0997-01](#), TGax MAC Ad Hoc July 2016 Meeting Agenda
 - [11-16-1000-02](#), July 2016 San Diego TGax MAC Ad hoc Meeting Minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-16-1012-00](#), TGax MU Ad-hoc Agenda July 2016
 - [11-16-1027-00](#), IEEE 802.11 TGax, MU Ad hoc July 2016 Meeting Minutes
 - TGax Spatial Reuse (SR) ad hoc group
 - [11-16-1016-01](#), 802.11ax Spatial Reuse Ad Hoc Group Agenda

- [11-16-1022-00](#), TGax Spatial Reuse ad hoc group meeting minutes

Achievements

1. Work Completed

- TGax received about 90 submissions.
 - Number of submissions: PHY/MAC/MU/SR/TG = 26/34/12/10/8.
 Most of the submissions are proposed resolutions for the comments on the draft 0.1.
 A number of submissions were proposing new text to be added to the draft.
 - A long list of submissions are yet to be considered.
- Approved the resolutions of about 230 comments discussed during telecons.
 - Exact count of resolved CIDs will be published by the Editor.
 - The TG editor is planning to have draft revision D0.3 ready based on resolved comments.

2. Technical Presentations

Here is the list of 90 submissions.

- **PHY** — 26 submissions
 - [11-16-0816](#), "Comment Resolution for CID 2183," Daewon Lee (Newracom)
 - [11-16-0872](#), "CR HE-SIG-A Part II," Ross Jian Yu (Huawei Technologies)
 - [11-16-0873](#), "CR HE-SIG-A Part I," Ross Jian Yu (Huawei Technologies)
 - [11-16-0891](#), "LDPC for 1024QAM," Hongyuan Zhang (Marvell)
 - [11-16-0892](#), "Spec Text on LDPC for 1024QAM," Hongyuan Zhang (Marvell)
 - [11-16-0893](#), "11ax Extended Range PPDU," Bin Tian (Qualcomm)
 - [11-16-0894](#), "HE-LTF Capabilities," Hongyuan Zhang (Marvell)
 - [11-16-0895](#), "Spec Text for HE-LTF Capabilities," Hongyuan Zhang (Marvell)
 - [11-16-0896](#), "11ax Beamformee Capabilities," Hongyuan Zhang (Marvell)
 - [11-16-0897](#), "Spec Text for Beamformee Capabilities," Hongyuan Zhang (Marvell)
 - [11-16-0898](#), "BW Field in HE-MU Format," Hongyuan Zhang (Marvell)
 - [11-16-0899](#), "Spec Text for BW Field in HE-MU Format," Hongyuan Zhang (Marvell)
 - [11-16-0900](#), "PHY Comment Resolution for CID 1052 and 2519," Bin Tian (Qualcomm)
 - [11-16-0903](#), "Gamma phase rotation for HE PPDU," Yujin Noh (Newracom)
 - [11-16-0904](#), "Proposed text for gamma phase rotation for HE PPDU," Yujin Noh (Newracom)
 - [11-16-0906](#), "RU restriction on 20MHz operating STAs," Joonsuk Kim (Apple)
 - [11-16-0908](#), "CR - proposed text on RU restriction of 20MHz STAs," Joonsuk Kim (Apple)
 - [11-16-0910](#), "Minimum Occupied Bandwidth," Ron Porat (Broadcom)
 - [11-16-0914](#), "Bit field finalization of HE-SIG-A," Lochan Verma (Qualcomm)
 - [11-16-0915](#), "Text for bit field finalization of HE-SIG-A," Lochan Verma (Qualcomm)
 - [11-16-0920](#), "PHY comment resolution for CID 1659,493,494," Xiaogang Chen (Intel)
 - [11-16-0922](#), "PHY CR 1024 QAM," Sriram Venkateswaran (Broadcom)
 - [11-16-0923](#), "PHY CR DCM Constellation Mapping," Sriram Venkateswaran (Broadcom)
 - [11-16-0928](#), "CR on Section 26.3.9.8 - HE-SIG-B," Kaushik Josiam
 - [11-16-0937](#), "11ax Comment Resolutions for Clauses 26.3.2-26.3.9.3-26.3.9.4-26.3.9.5-26.3.10.2- 26.3.10.13," Rui Cao (Marvell)
 - [11-16-0964](#), "Considerations on MAC-PHY interactions during SR operations," Jing Ma (NICT)
- **MAC** — 34 submissions
 - [11-16-0828](#), "HE Fragmentation - part 1," Alfred Asterjadhi (Qualcomm)
 - [11-16-0829](#), "Comment Resolution for Section 10.24.10 Block Ack/GCR block ack," Reza Hedayat (Newracom)
 - [11-16-0844](#), "CC0-Intra_PPDU_PS," Alfred Asterjadhi (Qualcomm)
 - [11-16-0856](#), "Issue of Buffer Status reporting," Stephane Baron (Canon)
 - [11-16-0860](#), "comment resolution on A-MPDU format," Yongho Seok (Newracom)

- [11-16-0861](#), "comment resolution on mu acknowledgment procedure," Yongho Seok (Newracom)
- [11-16-0862](#), "comment resolution on subclause 25.11," Yongho Seok (Newracom)
- [11-16-0864](#), "d0.1 comment resolution on clause 6," Yasuhiko Inoue (NTT)
- [11-16-0867](#), "CIDs for CIDs: Section 9.3.1.9.3 Compressed BA format," George Cherian (Qualcomm)
- [11-16-0868](#), "CIDs for Section 9.3.1.9.7 Multi STA BAs," George Cherian (Qualcomm)
- [11-16-0869](#), "Comment resolution section 9.3 TWT," Zhou Lan (Broadcom)
- [11-16-0871](#), "Trigger Frame Per User Info Order," Zhou Lan (Broadcom)
- [11-16-0877](#), "Comment resolution on CID 783 (TXOP Duration field format)," Jeongki Kim (LG Electronics)
- [11-16-0878](#), "Comment resolution on CID 782 (Intra-PPDU PS)," Jeongki Kim (LG Electronics)
- [11-16-0881](#), "Comment resolution on ROMI," Jayh Park (LG Electronics)
- [11-16-0882](#), "Comment resolution on TOMI," Jayh Park (LG Electronics)
- [11-16-0883](#), "Comment resolution for CID 152," Jayh Park (LG Electronics)
- [11-16-0884](#), "Spec. Text for HE Operation element and AID Assign Rule," Jianhan Liu (MediaTek)
- [11-16-0890](#), "Comment Resolution on NAV Setting of Single and Multiple Protection and Control Response," Po-Kai Huang (Intel)
- [11-16-0913](#), "SU Multi-TID Rules," Jarkko Knecht (Apple)
- [11-16-0916](#), "TID value of ALL ACK signaling," Woojin Ahn (Wilus Institute)
- [11-16-0917](#), "Text for TID value of ALL ACK signaling," Woojin Ahn (Wilus Institute)
- [11-16-0918](#), "Discussions on Partial BSS Color," Geonjung Ko (Wilus Institute)
- [11-16-0924](#), "NAV resetting with RTS/MU-RTS," Weimin Xing (ZTE)
- [11-16-0925](#), "Spex text on NAV resetting with RTS/MU-RTS," Weimin Xing (ZTE)
- [11-16-0941](#), "CR HE Fragmentation - part 2," Ming Gan (Huawei technologies)
- [11-16-0942](#), "CR Service Field," Ming Gan (Huawei Technologies)
- [11-16-0951](#), "Setting for TXOP Duration Field," Po-Kai Huang (Intel)
- [11-16-0952](#), "Spec text trigger frame per user info order," Zhou Lan (Broadcom)
- [11-16-0953](#), "Comment Resolution and Spec Text for Setting for TXOP Duration field," Po-Kai Huang (Intel)
- [11-16-0960](#), "AP access procedure for UL MU operation," Jinsoo Ahn (Yonsei Univ.)
- [11-16-0961](#), "Consideration on Multi-STA BlockAck Optimization," Hanseul Hong (Yonsei Univ.)
- [11-16-0962](#), "EDCA rules follow up 1," Jing Ma (NICT)
- [11-16-0963](#), "EDCA rules follow up 2," Jing Ma (NICT)
- [11-16-0966](#), "CID 71 and CID 190 Resolutions," Jarkko Knecht (Apple)
- [11-16-0998](#), "2 sets of EDCA parameters," Laurent Cariou (Intel)
- **Multi-User (MU)** — 12 submissions
 - [11-16-0866](#), "Comment Resolution of Section 26.3.13 MU-MIMO," Kome Oteri (InterDigital)
 - [11-16-0875](#), "CR for the section 10.3.2.8a CS Condition to Respond CTS," Kiseon Ryu (LG Electronics)
 - [11-16-0876](#), "CR for the section 25.5.2.4 UL MU CS CCA and CS Required Bit," Kiseon Ryu (LG Electronics)
 - [11-16-0880](#), "UL MU Transmission Rules - EDCA backoff," Jayh Park (LG Electronics)
 - [11-16-0885](#), "Comment Resolution on UL MU CS NAV Consideration," Po-Kai Huang (Intel)
 - [11-16-0886](#), "Comment Resolution for some UL MU CS TBD," Po-Kai Huang (Intel)
 - [11-16-0887](#), "Spec Text for MU-RTS restriction on HE MU PPDU," Po-Kai Huang (Intel)
 - [11-16-0926](#), "Soliciting UL_MU_ACK," Raja Banerjee (Qualcomm)
 - [11-16-0929](#), "CR - UL MU Operation," Simone Merlin (Qualcomm)
 - [11-16-0930](#), "CR - DL MU Operation," Simone Merlin (Qualcomm)
 - [11-16-0938](#), "Comment Resolution for Sub-clause 25.10.4," Chittabrata Ghosh (Intel)
 - [11-16-0958](#), "UL OFDMA for Unassociated STAs," Leonardo Lanante (Kyushu Institute of Tech.)
- **Spatial Reuse (SR)** — 10 submissions
 - [11-16-0879](#), "Comment resolution on SR for VHT PPDU," Jeongki Kim (LG Electronics)
 - [11-16-0889](#), "Comment Resolution for Spatial Reuse (Intra BSS detection)," Young Hoon Kwon (Newracom)
 - [11-16-0901](#), "Clarification of SR Fields in HE Trigger Based PPDU," Daewon Lee (Newracom)

- [11-16-0902](#), "Proposed Text Changes for SR Fields in HE Trigger-Based PPDU," Daewon Lee (Newracom)
- [11-16-0905](#), "SR Fields Clarification," Ron Porat (Broadcom)
- [11-16-0919](#), "Discussions on SR Fields in HE Trigger-based PPDU," Geonjung Ko (Wilus Institute)
- [11-16-0310](#), "DSC Proposal Text," Graham Smith (SR Technologies)
- [11-16-0945](#), "Clarifications for OBSS_PD-based SR parameters," Laurent Cariou (Intel)
- [11-16-0947](#), "Proposed text changes for OBSS_PD-based SR parameters," Laurent Cariou (Intel)
- [11-16-0957](#), "Comment Resolutions on OBSS_PD Conditions in 25.9.3," James Wang (MediaTek)
- **Others (covered in the TGax full sessions)** — 8 submissions
 - [11-15-1095](#), "OFDMA Performance in 11ax," Suhwook Kim (LG Electronics)
 - [11-16-0835](#), "EIFS," Alfred Asterjadhi (Qualcomm)
 - [11-16-0870](#), "Concluding MAC Trigger Padding," Zhou Lan (Broadcom)
 - [11-16-0907](#), "20MHz HE devices," Joonsuk Kim (Apple)
 - [11-16-0909](#), "CR - proposed text on 20 MHz devices," Joonsuk Kim (Apple)
 - [11-16-0949](#), "MAC trigger frame padding follow up," Zhou Lan (Broadcom)
 - [11-16-0965](#), "On High Efficiency WLAN (HEW) TG PAR Scope," Osama Aboul-Magd (Huawei Technologies)

3. Timeline

TG discussed the timeline. No changes since last update.

Current Timeline	
May 2014	Start of TG
November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and CC started
September 2016	Issue Draft 1.0 and start WG Letter Ballot
March 2017	Draft 2.0 and WG recirculation ballot
July 2017	MDR (Mandatory Draft Review)
November 2017	Formstion of Sponsor Ballot pool
March 2018	Initial Sponsor Ballot
December 2018	RevCom submittal

Goals for the September 2016 session

- Continue with Comment Resolutions.

Teleconferences

TGax teleconferences are scheduled after the July 2016 session.

Thursday	August 4 th , 2016	20:00 - 22:00 (ET) (approved during the May 2016 session)
Thursday	August 11 th and 25 th , 2016, September 1 st , 2016	10:00 - 12:00 (ET)
	August 18 th , 2016,	

Thursday

September 1st and 22nd, 2016

20:00 - 22:00 (ET)

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May 2016 — Waikoloa, HI

The TGax had 10 sessions during the week.

Six out of ten sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1				
AM2	TGax (full)	TGax (MU ad hoc) TGax (MAC+SR ad hoc)		TGax (full)
PM1			TGax (PHY ad hoc) TGax (MAC+SR ad hoc)	
PM2	TGax (PHY ad hoc) TGax (MAC+SR ad hoc)	TGax (PHY ad hoc) TGax (MU ad hoc)	TGax (PHY ad hoc) TGax (MAC+SR ad hoc)	TGax (full)
PM3	TGax (PHY ad hoc) TGax (MU ad hoc)			

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-16-0512-04](#), TGax May 2016 Meeting Agenda
 - [11-16-0686-00](#), IEEE 802.11 TGax May 2016 Waikoloa Meeting Minutes
 - [11-16-0739-00](#), TGax May 2016 Closing Report
 - TGax PHY ad hoc group
 - [11-16-0693-03](#), TGax PHY Ad Hoc May 2016 Meeting Agenda
 - [11-16-0755-00](#), May 2016 Waikoloa PHY Ad Hoc Meeting Minutes
 - TGax MAC and Spatial Reuse (SR) ad hoc group
 - [11-16-0698-04](#), TGax MAC and Spatial Reuse Ad Hoc Agenda May 2016 Meeting
 - [11-16-0701-00](#), Combined Spatial Reuse and MAC ad hoc group meeting minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-16-0697-02](#), TGax MU Ad-hoc Agenda May 2016
 - [11-16-0716-00](#), May 2016 Waikoloa TGax MU Ad Hoc Meeting minutes

Achievements

1. Work Completed

- TGax received about 70 submissions.
 - Numbers of submissions: PHY/MAC/MUSR/TG = 33/18/9/3/6.
 Majority of the submission were requesting changes to the TG Specification Framework.

Few submissions were addressing comment resolution mainly of the PHY clause.

- Agreed to terminate the Specification Framework process. The frame of reference is Draft D0.1.
 - Future submissions shall bring text to continue developing the TG draft.
 - The TG Technical Editor is planning to generate draft D0.2 based on outcome of this meeting.
- Approved the resolutions of about 200 comments, most of them addressing the PHY clause.
- Revisited and accepted a new modified timeline.

2. Technical Presentations

70 technical submissions have been received and have been covered during the week.

A list of the submissions is also available in the agenda document.

- **PHY** — 33 submissions
 - [11-16-0608](#), "Beamforming Feedback Report Structure," Sameer Vermani (Qualcomm)
 - [11-16-0610](#), "CR HE-SIG-A Part I," Ross Jian Yu (Huawei Technologies)
 - [11-16-0611](#), "Remaining Issues in Trigger Frame Design," Sameer Vermani (Qualcomm)
 - [11-16-0613](#), "SIG-B Related Issues," Lochan Verma (Qualcomm)
 - [11-16-0614](#), "Comment Resolution on Clause 26.1.1 Part 1," Lochan Verma (Qualcomm)
 - [11-16-0615](#), "Comment Resolution on Clause 26.3.12 Part 1," Lochan Verma (Qualcomm)
 - [11-16-0617](#), "Remaining Topics in Power Control," Bin Tian (Qualcomm)
 - [11-16-0618](#), "11ax CSD Design," Bin Tian (Qualcomm)
 - [11-16-0619](#), "PAPR Reduction of HE-SIGB," Bin Tian (Qualcomm)
 - [11-16-0620](#), "DCM PHY Parameters," Hongyuan Zhang (Marvell)
 - [11-16-0621](#), "DCM Interleaver," Tianyu Wu (MediaTek)
 - [11-16-0622](#), "16 QAM Mapping for DCM," Sudhir Srinivasa (Marvell)
 - [11-16-0623](#), "CR on Section 26.3.10.12," Bin Tian (Qualcomm)
 - [11-16-0625](#), "CR on Section 26.3.6," Bin Tian (Qualcomm)
 - [11-16-0626](#), "Feedback Element Compression for 802.11ax," Kome Oteri (InterDigital Communications)
 - [11-16-0633](#), "Left over Issues in RU Signaling for HE-SIGB," Yan Zhang (Marvell)
 - [11-16-0634](#), "11ax Comment Resolutions for Clauses 26.3.2," Yan Zhang (Marvell)
 - [11-16-0635](#), "BW indication for Non-contiguous Channel Bonding," Yunbo Li (Huawei Technologies)
 - [11-16-0636](#), "TXOP Duration field in HE-SIG-A," Jeongki Kim (LG Electronics)
 - [11-16-0637](#), "Load balancing indication for MU-MIMO over 484-tone and larger RU in OFDMA," Ming Gan (Huawei Technologies)
 - [11-16-0638](#), "Discussions for Non-contiguous Channel Bonding," John Son (Wilus)
 - [11-16-0639](#), "Follow-up on HE-SIG-B user-specific field," Jinsoo Choi (LG Electronics)
 - [11-16-0649](#), "Feedback Tone Map and Quantization," Sriram Venkateswaran (Broadcom)
 - [11-16-0652](#), "Power scaling of 4 extra tones," Xiaogang Chen (Intel)
 - [11-16-0653](#), "CR on section 26.3.3," Xiaogang Chen (Intel)
 - [11-16-0654](#), "CP and LTF Options and Signaling," Ron Porat (Broadcom)
 - [11-16-0655](#), "On MCS0 DCM Modulation and DCM Capability," Jianhan Liu (MediaTek)
 - [11-16-0656](#), "1024QAM Modulation," Jianhan Liu (MediaTek)
 - [11-16-0658](#), "CR on 26.3.7.1," Jinsoo Choi (LG Electronics)
 - [11-16-0659](#), "CR on 26.3.9.9 and 26.3.5," Eunsung Park (LG Electronics)
 - [11-16-0663](#), "CR on Section 26.2.2," Ke Yao (ZTE)
 - [11-16-0681](#), "Comment Resolution CID 215 2486," Daewon Lee (Newracom)
 - [11-16-0682](#), "CR CID on PHY data field other," Daewon Lee (Newracom)
- **MAC** — 18 submissions
 - [11-16-0583](#), "Backoff Procedure Handling Upon TF Reception," Yu Wang (Ericsson)
 - [11-16-0584](#), "Need of SDU Fragmentation to Reduce Padding Ratio in UL-OFDMA Transmission," Yu Wang (Ericsson)
 - [11-16-0588](#), "Channel State Estimation based Bidirectional Initialized Random Access," Bo Li (Northwestern Polytechnical Univ.)

- [11-16-0590](#), "Multi-BSS Association for Edge Users of Throughput Improvements," Mao Yang (Northwestern Polytechnical Univ.)
- [11-16-0616](#), "BlockAck generation and selection rules," Alfred Asterjadhi (Qualcomm)
- [11-16-0627](#), "ROM Recovery Rules," Jayh Hyunhee Park (LG Electronics)
- [11-16-0628](#), "Buffer Status Report in HE Control field," Jayh Hyunhee Park (LG Electronics)
- [11-16-0640](#), "BSS Color Collision," Geonjung Ko (Wilus Institute)
- [11-16-0641](#), "Regarding HE fragmentation," Woojin Ahn (Yonsei Univ.)
- [11-16-0643](#), "HE Control Scheduling," Liwen Chu (Marvell)
- [11-16-0644](#), "SS Allocation in Trigger," Liwen Chu (Marvell)
- [11-16-0645](#), "MU Minimum MPDU Start Spacing," Liwen Chu (Marvell)
- [11-16-0646](#), "HE Beamforming Feedback," Liwen Chu (Marvell)
- [11-16-0657](#), "In-device Multi-radio Coexistence and UL MU operation," Robert Stacy (Intel)
- [11-16-0673](#), "Multi-User EDCA," Jinsoo Ahn (Yonsei Univ.)
- [11-16-0674](#), "EIFS excess problem of Acknowledgement for UL MU procedure," Hanseul Hon (Yonsei Univ.)
- [11-16-0675](#), "comment resolution for CID2383," Yonggang Fang (ZTE)
- [11-16-0684](#), "Channel Access Efficiency," Evgeny Khorov (IITP)
- **Multi-User (MU)** — 9 submissions
 - [11-16-0582](#), "Random Access RU Allocation in the Trigger Frame," Evgeny Khorov (IITP)
 - [11-16-0591](#), "Issues related to OCW management," Patrice Nezou (Canon)
 - [11-16-0592](#), "Follow up on Issue related to unused UL OFDMA RUs," Stephane Baron (Canon)
 - [11-16-0648](#), "MU-RTS/CTS PHY Format," Po-Kai Huang (Intel)
 - [11-16-0661](#), "Adaptive Random Access UL OFDMA," Leonardo Lanante (Kyushu Institute of Technology)
 - [11-16-0662](#), "Further consideration on channel access rule to facilitate MU transmission opportunity," Jing Ma (NICT)
 - [11-16-0664](#), "Consideration on backoff procedure for UL MU transmission," Jing Ma (NICT)
 - [11-16-0665](#), "Some Notes on Interference Alignment for Downlink Multi-User MIMO," Dzevdan Kapetanovic (Ericsson)
 - [11-16-0667](#), "Signaling of Multi-TID Aggregation Limit," Chittabrata Ghosh (Intel)
- **Spatial Reuse (SR)** — 3 submissions
 - [11-16-0581](#), "Proposed changes to SR clause," Soma Tayamon (Ericsson)
 - [11-16-0589](#), "Fractional-Backoff Procedure and Dynamic CCA," Bo Li (Northwestern Polytechnical University)
 - [11-16-0647](#), "Consideration of Spatial Reuse for Trigger Frame," Po-Kai Huang (Intel)
- **Others (covered in TGax full sessions)** — 6 submissions
 - [11-16-0571](#), "QoS Handling of Trigger Frame," Yu Wang (Ericsson)
 - [11-16-0597](#), "TG ax Indoor Enterprise Scenarios, Color, DSC and TPC," Graham Smith (SR Technologies)
 - [11-16-0604](#), "Simulation-based evaluation of DSC in enterprise scenario," Tanguy Ropitault (NIST)
 - [11-16-0609](#), "HE NDPA frame format," Ross Jian Yu (Huawei)
 - [11-16-0612](#), "Mandatory/Optional Issues for 802.11ax," Sameer Vermani (Qualcomm)
 - [11-16-0629](#), "Box 5 Calibration Results," Marik Hsiao (MediaTek)

3. Timeline

TG discussed and revised the timeline as follows.

Current Timeline		Modified Timeline	
May 2014	Start of TG	May 2014	Start of TG
November 2014	First draft of the TG SFD approved	November 2014	First draft of the TG SFD approved
January 2016	Proposed TG draft	January 2016	Proposed TG draft
March 2016	Draft 0.1 was approved and CC started	March 2016	Draft 0.1 was approved and CC started
July 2016	Issue Draft 1.0 and start WG Letter Ballot	September 2016	Issue Draft 1.0 and start WG Letter Ballot
March 2017	Draft 2.0 and WG recirculation ballot	March 2017	Draft 2.0 and WG recirculation ballot

		July 2017	MDR (Mandatory Draft Review)
		November 2017	Formation of Sponsor Ballot pool
January 2018	Initial Sponsor Ballot	March 2018	Initial Sponsor Ballot
		December 2018	RevCom submittal

Goals for the July 2016 session

- Continue with comment resolutions.

Teleconferences

Weekly teleconferences are planned after the May 2016 session.

Thursday	June 2 nd , 2016	10:00 - 12:00 (ET)
Thursday	June 16 th , 2016	10:00 - 12:00 (ET)
Thursday	June 23 rd , 2016	20:00 - 22:00 (ET)
Thursday	June 30 th , 2016	10:00 - 12:00 (ET)
Thursday	July 7 th , 2016,	20:00 - 22:00 (ET)
Thursday	July 14 th , 2016	10:00 - 12:00 (ET)
Thursday	August 4 th , 2016	20:00 - 22:00 (ET)

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March 2016 — Macau

The TGax had 9 sessions during the week.

Five out of nine sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1				
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full)
PM1	TGax (full)		TGax (PHY ad hoc) TGax (MAC ad hoc)	
PM2		TGax (MAC ad hoc) TGax (SR ad hoc)	TGax (MAC ad hoc) TGax (MU ad hoc)	TGax (full)
PM3	TGax (SR ad hoc) TGax (MU ad hoc)	TGax (full)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-16-0235-07](#), TGax March 2016 Meeting Agenda
 - [11-16-0415-00](#), IEEE 802.11 TGax March 2016 Macau Meeting Minutes
 - [11-16-0475-00](#), TGax March 2016 Closing Report
 - TGax PHY ad hoc group
 - [11-16-0421-03](#), TGax PHY Ad Hoc March 2016 Meeting Agenda
 - [11-16-0509-00](#), TGax March 2016 Macau PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-16-0427-04](#), TGax MAC Ad Hoc March 2016 Meeting Agenda
 - [11-16-0439-01](#), March 2016 Macau TGax MAC ad hoc meeting minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-16-0419-02](#), TGax MU Ad-hoc Agenda March 2016
 - [11-16-0466-00](#), TGax MU Ad Hoc Meeting minutes March 2016
 - TGax Spatial Reuse (SR) ad hoc group
 - [11-16-0422-02](#), TGax SR Ad Hoc March 2016 Agenda
 - [11-16-0537-00](#), TGax SR Ad Hoc group March 2016 minutes

Achievements

1. Passed a number of motions affecting all aspects of the TG Specification Framework

- PHY — 22 motions passed.
- MAC — 17 motions passed.
- MU — 9 motions passed.
- SR — 2 motions passes.

2. TG Documents

- Latest revision of the Specification Framework is available at;
<https://mentor.ieee.org/802.11/dcn/15/11-15-0132-16-00ax-spec-framework.docx>
- Other TG documents
 - Simulation Scenarios: <https://mentor.ieee.org/802.11/dcn/14/11-14-0980-16-00ax-simulation-scenarios.docx>
 - Evaluation Methodology: <https://mentor.ieee.org/802.11/dcn/14/11-14-0571-12-00ax-evaluation-methodology.docx>
 - Channel Models: <https://mentor.ieee.org/802.11/dcn/14/11-14-0882-04-00ax-tgax-channel-model-document.docx>
 - Functional Requirements: <https://mentor.ieee.org/802.11/dcn/14/11-14-1009-02-00ax-proposed-802-11ax-functional-requirements.doc>

3. Technical Presentations

48 technical submissions have been covered during the week.

Here is the list of submissions which is also available in the agenda document.

- PHY — 12 submissions
 - [11-15-1354](#), "SIGA fields and Bitwidths," Ron Porat (Broadcom)
 - [11-16-0203](#), "Signalling Support for Full Bandwidth MU-MIMO Compressed SIG-B Mode," Lei Huang (Panasonic)
 - [11-16-0319](#), "I-Q Decoupled OFDM: A Solution To I/Q Imbalance," Shouxing Simon Qu (Blackberry)
 - [11-16-0335](#), "HE-STF sequences for 160/80+80MHz," Eunsung Park (LG Electronics)
 - [11-16-0343](#), "Spectral Mask Discussion," Hongyuan Zhang (Marvell)
 - [11-16-0344](#), "PHY Padding Related Issues," Hongyuan Zhang (Marvell)
 - [11-16-0346](#), "11ax Pilot Sequence," Bin Tian (Qualcomm)
 - [11-16-0349](#), "HE-SIG-B Compression Mode," Kaushik Josiam (Samsung)
 - [11-16-0367](#), "Power Scaling of L-LTF and L-STF," Yakun Sun (Marvell)

- [11-16-0389](#), "Sounding Design," Sriram Venkateswaran (Broadcom)
- [11-16-0395](#), "Preamble transmission for Uplink OFDMA," Ming Gan (Huawei)
- [11-16/0397](#), "HE-SIG-B Signaling Discussions," John Son (WILUS Institute)
- **MAC** — 18 submissions
 - [11-16-0297](#), "Results for beacon collisions," Evgeny Khorov (IITP RAS)
 - [11-16-0345](#), "Simultaneous NAK for MU GCR-BA," Jinsoo Ahn (Yonsei Univ.)
 - [11-16-0347](#), "Fragmentation for MU frames-Follow up on parameters," Alfred Asterjadhi (Qualcomm)
 - [11-16-0352](#), "Considerations on MU initial link setup," Woojin Ahn (Yonsei Univ.)
 - [11-16-0353](#), "MU-RTS/CTS for TWT Protection," Hanseul Hong (Yonsei Univ.)
 - [11-16-0358](#), "Maximal A-MPDU Size," Liwen Chu (Marvell)
 - [11-16-0359](#), "Management ACK," Liwen Chu (Marvell)
 - [11-16-0361](#), "Ack Policy of UL MU frame," Jeongki Kim (LG Electronics)
 - [11-16-0362](#), "Multi-TID Aggregation Limit," Chittabrata Ghosh (Intel)
 - [11-16-0365](#), "Multi-STA BA Design," Xiaofei Wang (InterDigital)
 - [11-16-0368](#), "MAC padding options for legacy trigger frame," Zhou Lan (Broadcom)
 - [11-16-0369](#), "M-BA aggregated trigger frame," Zhou Lan (Broadcom)
 - [11-16-0377](#), "Sounding Sequences Clarifications," Simone Merlin (Qualcomm)
 - [11-16-0378](#), "Extended BA Bitmap," Simone Merlin (Qualcomm)
 - [11-16-0383](#), "RU Signaling in Trigger Frame," Yunbo Li (Huawei)
 - [11-16-0396](#), "Issues on BSS Color Bits Collision," Geonjung Ko (WILUS Institute)
 - [11-16-0399](#), "Considerations on Trigger Frame for Random Access Procedure," Evgeny Khorov (IITP RAS)
 - [11-16-0404](#), "BlockAck Bitmap," Dengyu Qiao (Huawei)
- **Multi-User (MU)** — 6 submissions
 - [11-16-0331](#), "Power Control for Multi-User Transmission in 802.11ax," Kome Oteri (InterDigital)
 - [11-16-0333](#), "Issue related to unused UL OFDMA RUs," Stephane Baron (Canon)
 - [11-16-0340](#), "Random Access UL MU Resource Allocation and Indication," Leonardo Lanante (Kyushu Institute of Technology)
 - [11-16-0371](#), "Further consideration for MU-RTS/CTS," Jing Ma (NICT)
 - [11-16-0379](#), "Trigger Frame Format," Simone Merlin (Qualcomm)
 - [11-16-0413](#), "Power Control for UL MU," Arjun Bharadwaj (Qualcomm)
- **Spatial Reuse (SR)** — 7 submissions
 - [11-16-0212](#), "Enterprise Scenario DSC and Color," Graham Smith (SR Technplogies)
 - [11-16-0310](#), "DSC Proposed Text," Graham Smith (SR Technplogies)
 - [11-16-0350](#), "Enterprise Scenario TPC and DSC," Graham Smith (SR Technplogies)
 - [11-16-0360](#), "Simulation results of spatial reuse with various MCSs," Junichi Iwatani (NTT)
 - [11-16-0382](#), "Discussion on Spatial Reuse Operations in 11ax," Yunbo Li (Huawei)
 - [11-16-0403](#), "Spatial Re-Use with Adaptive CCA and TPC Simulation," Frank Hsu (MediaTek)
 - [11-16-0414](#), "Adjustment Rules for Adaptive CCA and TPC," James Wang (MediaTek)
- **Others (covered in the TGax full session)** — 5 submissions
 - [11-15-1095](#), "OFDMA Performance in 11ax," Suhwook Kim (LG Electronics)
 - [11-16-0066](#), "Views on UL MU Features," Joonsuk Kim (Apple)
 - [11-16-0355](#), "Snapshot of Residential Use 2016," Carol Ansley (ARRIS Group)
 - [11-16-0364](#), "AID Assign Rules Based on BSS Color and HE Operation Element," Jianhan Liu (MediaTek)
 - [11-16-0394](#), "Achieving High Efficiency in Medium Access via Roster Mode," Sean Coffey (RealTek)

4. Draft Specification

The TGax approved version 0.1 of the draft specification.

< TG Motion >

Move to accept document 11-16/0024r1 as the TG draft specification D0.1, and start a 21 day comment collection

period.

- The submission is available at: <https://mentor.ieee.org/802.11/dcn/16/11-16-0024-01-00ax-proposed-draft-specification.docx>

Moved by Robert Stacey, Second by Simone Merlin.

Result: Y/N/A = 75/0/5, motion passes.

Goals for the May 2016 session

- Comment Resolution.
- Technical presentations.
- Revisit the timeline based on the number of comments received.

Teleconferences

TGax teleconferences are planned before the May 2016 session.

Thursday	April 14 th , 2016,	10:00 - 12:00 (ET)
Thursday	April 21 st , 2016	20:00 - 22:00 (ET)
Thursday	April 28 th , 2016,	10:00 - 12:00 (ET)
Thursday	May 5 th , 2016	20:00 - 22:00 (ET)

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January 2016 — Atlanta, GA

The TGax had 10 sessions during the week.

Four out of ten sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	
AM2	TGax (full)	TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full)
PM1		TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)	
PM2	TGax (MAC ad hoc) TGax (SR ad hoc)		TGax (full)	TGax (full)
PM3		TGax (MU ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-15-1516-03](#), TGax January 2016 Meeting Agenda
 - [11-16-0096-00](#), IEEE 802.11 TGax January 2016 Atlanta Meeting Minutes
 - [11-16-0187-00](#), TGax January 2016 Closing Report
 - TGax PHY ad hoc group
 - [11-16-0108-02](#), TGax PHY Ad Hoc January 2016 Meeting Agenda
 - [11-16-0119-00](#), TGax January 2016 Atlanta PHY Ad Hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-16-0109-02](#), TGax MAC Ad Hoc January 2016 Meeting Agenda
 - [11-16-0110-00](#), Jan 2016 Atlanta TGax MAC ad hoc meeting minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-16-0147-01](#), TGax MU Ad-hoc Agenda January 2016
 - [11-16-0150-00](#), January 2016 Atlanta TGax MU Ad Hoc Meeting minutes

Achievements

1. Passed a number of motions affecting all aspects of the TG Specification Framework

- PHY — 30 motions passed.
- MAC — 9 motions passed.
- MU — 7 motions passed.

2. TG Documents

- Latest revision (rev. 15) of the Specification Framework is available at;
<https://mentor.ieee.org/802.11/dcn/15/11-15-0132-15-00ax-spec-framework.docx>
- Other TG documents
 - Simulation Scenarios: <https://mentor.ieee.org/802.11/dcn/14/11-14-0980-16-00ax-simulation-scenarios.docx>
 - Evaluation Methodology: <https://mentor.ieee.org/802.11/dcn/14/11-14-0571-12-00ax-evaluation-methodology.docx>
 - Channel Models: <https://mentor.ieee.org/802.11/dcn/14/11-14-0882-04-00ax-tgax-channel-model-document.docx>
 - Functional Requirements: <https://mentor.ieee.org/802.11/dcn/14/11-14-1009-02-00ax-proposed-802-11ax-functional-requirements.doc>

3. Technical Presentations

48 technical submissions have been covered during the week.

A list of the submissions is available in the agenda document.

- PHY — 22 submissions
 - [11-16-0030](#), "Maximum Tone Grouping Size for 802.11ax Feedback with MU-MIMO," Kome Oteri (InterDigital)
 - [11-16-0033](#), "1x HE-LTF for ULMUMIMO," Hongyuan Zhang (Marvell)
 - [11-16-0034](#), "Beamforming with HE-LTF Compression," Hongyuan Zhang (Marvell)
 - [11-16-0036](#), "CRC Generation for HE-SIG," Yakun Sun (Marvell)
 - [11-16-0037](#), "Continuous Puncturing for HE-SIGB Encoding," Yakun Sun (Marvell)
 - [11-16-0038](#), "Sequence for 1x LTF," Daewon Lee (Newracom)
 - [11-16-0039](#), "RU Allocation in SIG-B," Daewon Lee (Newracom)
 - [11-16-0040](#), "Issues with Compressed SIG-B Mode," Yujin Noh (Newracom)
 - [11-16-0041](#), "Link Adaptation for HE WLAN," Yujin Noh (Newracom)
 - [11-16-0044](#), "MCS Levels and TX EVM Requirement for 1024 QAM," Eunsung Park (LG Electronics)
 - [11-16-0045](#), "Flexible Wider Bandwidth Transmission," John Son (WILUS)
 - [11-16-0046](#), "Content for the extra tones in LSIG and RLSIG," Jiayin Zhang (Huawei)
 - [11-16-0047](#), "Discussion on the HE Extended Range SU PPDU," Jiayin Zhang (Huawei)

- [11-16-0052](#), "Remaining HE-LTF Sequence Design," Le Liu (Huawei)
- [11-16-0053](#), "Requirements for UL MU Transmissions," Arjun Bharadwaj (Qualcomm)
- [11-16-0056](#), "On QPSK DCM Modulation and LDPC Tone Mapper for DCM," Jianhan Liu (MediaTek)
- [11-16-0071](#), "Packet Extension Follow Up," Ron Porat (Broadcom)
- [11-16-0079](#), "Allocation sizes for BCC in OFDMA," Ken Taniguchi (Toshiba)
- [11-16-0080](#), "1x/2x/4x OFDM Symbol in HE SU PPDU with BCC," Heejung Yu (Yeungnam Univ./NEWRACOM)
- [11-16-0088](#), "Ng for Compressed Beamforming feedback," Sriram Venkateswaran (Broadcom)
- [11-16-0089](#), "Single Stream Pilots in UL MU MIMO," Sriram Venkateswaran (Broadcom)
- [11-16-0104](#), "Rate Matching for HE-SIG-B," Daewon Lee (Newracom)
- **MAC** — 12 submissions
 - [11-16-0015](#), "Explicit Block Ack Request in DL MU PPDU," Yongho Seok (Newracom)
 - [11-16-0017](#), "Beacon Collision Avoidance," Evgeny Khorov (IITP)
 - [11-16-0018](#), "TDMA for Eliminating Hidden Station Effect in Dense Networks," Evgeny Khorov (IITP)
 - [11-16-0028](#), "Follow Up for Multi-STA BA for SU Transmissions," Xiaofei Wang (InterDigital)
 - [11-16-0029](#), "TXOP Truncation Enhancement," Xiaofei Wang (InterDigital)
 - [11-16-0042](#), "BSS Color Settings for a Multiple BSSID Set," Geonjung Ko (WILUS)
 - [11-16-0050](#), "Fragmentation for MU frames-Follow up on acks," Alfred Asterjadhi (Qualcomm)
 - [11-16-0051](#), "Response Give Trigger Type," David Xun Yang (Huawei)
 - [11-16-0068](#), "BSS Color and Multiple BSSID," Liwen Chu (Marvell)
 - [11-16-0069](#), "Multi-TID A-MPDU in MU Transmission," Liwen Chu (Marvell)
 - [11-16-0087](#), "NAV cancellation issues on MU protection," Jinsoo Ahn (Yonsei Univ.)
 - [11-16-0102](#), "High Efficiency Medium Access via Rosters," Sean Coffey (RealTek)
- **Multi-User (MU)** — 9 submissions
 - [11-16-0031](#), "Proposed UL MU CS Rules," Lei Wang (Marvell)
 - [11-16-0048](#), "Protection using MU RTS/CTS," Young Hoon Kwon (Newracom)
 - [11-16-0054](#), "UL MU CCA Response," Kaiying Lv (ZTE)
 - [11-16-0057](#), "Indication for UL MU Carrier Sensing," Kiseon Ryu (LG Electronics)
 - [11-16-0065](#), "Duration/ID field in UL-MU," Tomo Adachi (Toshiba)
 - [11-16-0066](#), "Views on UL-MU Features," Joonsuk Kim (Apple)
 - [11-16-0067](#), "MAC Padding in Trigger Frame," Liwen Chu (Marvell)
 - [11-16-0085](#), "Congestion control for UL MU random access," Woojin Ahn (Yonsei Univ.)
 - [11-16-0091](#), "Regarding HE NDPA frame for DL Sounding Sequence," Narendar Madhavan (Toshiba)
- **Spatial Reuse (SR)** — 1 submission
 - [11-16-0060](#), "Recipient-aware Spatial Reuse," Reza Hedayat (Newracom)
- **Others (presented in the TGax full session)** — 4 submissions
 - [11-15-1095](#), "OFDMA Performance in 11ax," Suhwook Kim (LG Electronics)
 - [11-16-0024](#), "Proposed draft specification," Robert Stacy (Intel)
 - [11-16-0043](#), "Clarification of SFD Texts," John Son (WILUS)
 - [11-16-0059](#), "Non-contiguous Channel Bonding in 11ax," Yunbo Li (Huawei)

4. Draft Specification

- Document [11-16-0024-00](#) was submitted by the TG Editor and it includes a "draft" draft specification.
- The submission was reviewed by the TG Editor and is available on mentor to be reviewed by TG members.

5. Plan for Progressing TG Draft

- Approve the TG draft specification during the March 2016 meeting.
 - Draft 0.1
- Start a comment collection (CC) for 30 days on draft 0.1 - Ends some time in April.
- Comment resolution (May and July)
- Draft 1.0 in July 2016 and start WG LB.

Goals for the March 2016 session

- Discuss Proposals affecting the TG Specification Framework document
- Approve D0.1 of the TG Draft
- Approve a 30-day Comment Collection Process.

Teleconferences

Three teleconferences are planned before the March 2016 session.

Thursday	February 4 th , 2016,	10:00 - 12:00 (ET)
Thursday	February 18 th , 2016	20:00 - 22:00 (ET)
Thursday	March 3 rd , 2016,	10:00 - 12:00 (ET)

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November 2015 — Dallas, TX

The TGax originally planned 10 sessions during the week.

One session was added during the WG mid-week plenary session.

Five out of eleven sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full, ad hoc)		TGax (full)	TGax (full)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full)
PM1	TGax (full)	TGax (MU ad hoc) TGax (SR ad hoc)	TGax (PHY ad hoc) TGax (SR ad hoc)	TGax (full)
PM2			TGax (PHY ad hoc) TGax (MU ad hoc)	
PM3		TGax (PHY ad hoc) TGax (MAC ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-15-1232-04](#), TGax November 2015 Meeting Agenda
 - [11-15-1368-01](#), IEEE 802.11 TGax November 2015 Dallas Meeting Minutes
 - [11-15-1457-00](#), TGax November 2015 Closing Report
 - TGax PHY ad hoc group
 - [11-15-1385-03](#), TGax PHY Ad Hoc November 2015 Meeting Agenda
 - [11-15-1442-00](#), November 2015 Dallas TGax PHY Ad Hoc Meeting Minutes

- TGax MAC ad hoc group
 - [11-15-1382-03](#), TGax MAC Ad Hoc November 2015 Meeting Agenda
 - [11-15-1414-00](#), Nov 2015 Dallas TGax MAC ad hoc meeting minutes
- TGax Multi-User (MU) ad hoc group
 - [11-15-1418-02](#), TGax MU Ad-hoc Agenda November 2015
 - [11-15-1423-01](#), November 2015 Dallas TGax MU Ad Hoc Meeting minutes
- TGax Spatial Reuse (SR) ad hoc group
 - [11-15-1403-06](#), TGax SR Ad Hoc November 2015 Agenda
 - [11-15-1421-01](#), Minutes of the IEEE 802.11ax Spatial Reuse ad hoc group meeting - Dallas, November 2015

Achievements

1. Passed a number of motions affecting all aspects of the TG Specification Framework

- PHY — 33 motions.
- MAC — 16 motions.
- Multi-User (MU) — 12 motions.
- Spatial Reuse (SR) — 1 motion.

2. TG Documents

- Latest revision of the Specification Framework is available
 - <https://mentor.ieee.org/802.11/dcn/15/11-15-0132-10-00ax-spec-framework.docx>
- Approved new revisions of the TGax Simulation Scenario and Evaluation Methodology documents.
 - [Simulation Scenarios](#)
 - [Evaluation Methodology](#)
- Other documents
 - [TGax Channel Models](#)
 - [802.11ax Functional Requirements](#)

3. Technical Presentations

70 technical submissions have been covered during the week.

A list of the submissions is here which is also contained in the agenda document.

- **PHY** — 27 submissions
 - [11-15-1059](#), "SIG-B Encoding Structure Part II," Ron Porat (Broadcom)
 - [11-15-1289](#), "Non-Uniform Constellations for 1024-QAM," Thomas Handte (Sony)
 - [11-15-1303](#), "LTF Sequence Designs," Sungho Moon (Newracom)
 - [11-15-1304](#), "Supported Resource Allocations in SIG-B," Sungho Moon (Newracom)
 - [11-15-1305](#), "STBC and Padding Discussions" Hongyuan Zhang (Marvell)
 - [11-15-1309](#), "Extended Range Support for 11ax," Sameer Vermani (Qualcomm)
 - [11-15-1310](#), "11ax LDPC Tone Mapper for 160MHz," Bin Tian (Qualcomm)
 - [11-15-1311](#), "11ax Spectral Mask," Bin Tian (Qualcomm)
 - [11-15-1315](#), "HE-SIG-B Mapping and Compression," Kaushik Josiam (Samsung)
 - [11-15-1320](#), "Maximum Tone Grouping Size for 802.11ax Feedback," Kome Oteri (InterDigital)
 - [11-15-1321](#), "Reducing Explicit MIMO Compressed Beamforming Feedback Overhead for 802.11a," Kome Oteri (InterDigital)
 - [11-15-1322](#), "Channel Estimation Enhancement and Transmission Efficiency Improvement Using Beam-Change Indication and 1x HE-LTF," Jianhan Liu (MediaTek)
 - [11-15-1323](#), "HE-STF Sequence," Ensung Park (LG Electronics)
 - [11-15-1324](#), "MCS for HE-SIG-B," Dongguk Lim (LG Electronics)
 - [11-15-1327](#), "Diversity Mode in OFDMA," Yujin Noh (Newracom)
 - [11-15-1329](#), "Link Adaptation for HE WLAN," Yujin Noh (Newracom)
 - [11-15-1331](#), "PHY Padding Capability Signaling," Daewon Lee (Newracom)

- [11-15-1332](#), "Implicit Sounding for HE WLAN," Daewon Lee (Newracom)
- [11-15-1334](#), "HE-LTF Sequence Design," Le Liu (Huawei)
- [11-15-1335](#), "HE-SIG-B Contents," Le Liu (Huawei)
- [11-15-1347](#), "Strategies to reduce MIMO feedback overhead," Filippo Tosato (Toshiba)
- [11-15-1349](#), "Sounding for Uplink Transmission," Sungho Moon (Newracom)
- [11-15-1350](#), "Spatial Configuration And Signaling for MU-MIMO," Yakun Sun (Marvell)
- [11-15-1353](#), "Preamble Formats," Ron Porat (Broadcom)
- [11-15-1354](#), "SIGA fields and Bitwidths," Ron Porat (Broadcom)
- [11-15-1357](#), "Extra tones in the preamble," Xiaogang Chen (Intel)
- [11-15-1372](#), "L-LENGTH Equation Updates," Hongyuan Zhang (Marvell)
- **MAC** — 14 submissions
 - [11-15-1265](#), "RTS/CTS for UL DL OFDMA Control," Cheeha Kim (POSTECH)
 - [11-15-1278](#), "HE MU Acknowledgment Procedure," Yongho Seok (Newracom)
 - [11-15-1300](#), "DL MU transmission sequence," Yong Hoon Kwon (Newracom)
 - [11-15-1318](#), "Fragmentation for MU frames-Follow up," Alfred Asterjadhi (Qualcomm)
 - [11-15-1319](#), "Scheduled Trigger frames-Follow up," Alfred Asterjadhi (Qualcomm)
 - [11-15-1330](#), "A method of transmitting Multi-STA Block frame," Jeongki Kim (LG Electronics)
 - [11-15-1341](#), "Reception Status of Frames Transmitted in Random Access RUs," Tomoko Adachi (Toshiba)
 - [11-15-1344](#), "Trigger Frame Format," Simone Merlin (Qualcomm)
 - [11-15-1345](#), "Trigger type specific information," Kiseon Ryu (LG Electronics)
 - [11-15-1346](#), "Ack Policy for UL MU Ack transmission," Kiseon Ryu (LG Electronics)
 - [11-15-1351](#), "Rate MCS Selection Rules for M-BA and DL OFDMA BA," Liwen Chu (Marvell)
 - [11-15-1352](#), "broadcast STAID in HE SIG B," Liwen Chu (Marvell)
 - [11-15-1355](#), "Considerations for TDLS transmission in 11ax," Yingpei Lin (Huawei)
 - [11-15-1359](#), "System Performance Evaluation of 802.11ae," Yu Wang (Ericsson)
- **Multi-User (MU)** — 12 submissions
 - [11-15-1280](#), "Traffic priority for random Multi User Uplink OFDMA," Stephane Baron (Canon)
 - [11-15-1301](#), "NAV Rule for UL MU Response," Yingpei Lin (Huawei)
 - [11-15-1312](#), "MU BAR Frame Format," Reza Hedayat (Newracom)
 - [11-15-1314](#), "I/Q Imbalance Impact to TGax OFDMA Uplink Reception," Rui Yang (InterDigital)
 - [11-15-1325](#), "MU-RTS/CTS Follow Up," Po-Kai Huang (Intel)
 - [11-15-1326](#), "NAV Consideration for UL MU Response Follow Up," Po-Kai Huang (Intel)
 - [11-15-1328](#), "Scheduling information for UL OFDMA Acknowledgement," Yujin Noh (Newracom)
 - [11-15-1340](#), "NDP Announcement for HE Sequence," Narendar Madhavan (Toshiba)
 - [11-15-1364](#), "Signaling Trigger Information for STAs in 11ax," Chittabrata Ghosh (Intel)
 - [11-15-1369](#), "Random access based buffer status report," Woojin Ahn (Yonsei Univ.)
 - [11-15-1370](#), "UL OFDMA Random Access Control," Jinsoo Ahn (Yonsei Univ.)
 - [11-15-1374](#), "Consideration for protecting cascading MU DL/UL transmission with MU RTS/CTS," Jing Ma (NICT)
- **Spatial Reuse (SR)** — 9 submissions
 - [11-15-1259](#), "Use of TG ax Scenarios for Spatial Reuse," Graham Smith (SR Technologies)
 - [11-15-1284](#), "Simulation results for spatial reuse in 11ax," Jinmin Kim (LG Electronics)
 - [11-15-1313](#), "Considerations for Spatial Reuse," Reza Hedayat (Newracom)
 - [11-15-1316](#), "DSC calibration results with NS-3," M. Shahwaiz Afaqui (T.U. Catalonia)
 - [11-15-1336](#), "BSS Color Field Size Measurements," Chuck Lukaszewski (Aruba-HP)
 - [11-15-1337](#), "Secondary Channel CCA of HE STA," John Son (Willus Institute)
 - [11-15-1338](#), "Improving Spatial Reuse During OBSS UL MU Procedure," Geonjung Ko (Willus Institute)
 - [11-15-1348](#), "Multiple NAVs for Spatial Reuse," Sigurd Schelstraete (Quantenna)
 - [11-15-1427](#), "Drivers of the dynamic CCA adaptation," Eduard Garcia-Villegas (Technical Univ. of Catalonia)
- **Others (presented in the TGax full session)** — 8 submissions

- [11-15-1288](#), "An issue of wider bandwidth operation at real denser environment," Katsuo Yunoki (KDDI R&D Labs)
- [11-15-1302](#), "System Level Simulator Evaluation with/without Capture Effect," Vida Ferdowsi (Newracom)
- [11-15-1360](#), "Implications of wrap-around for TGax Scenario 3 and Scenario 4 - follow-up," Marcin Filo (Univ. of Surrey)
- [11-15-1361](#), "Energy consumption with Scheduled PSP," Dmitry Akhmetov (Intel)
- [11-15-1362](#), "On TGax Scenario 4 channel model - follow-up," Marcin Filo (Univ. of Surrey)
- [11-15-1363](#), "Regulatory Landscape for Narrowband Transmissions in 11ax," Ilan Sutskov (Intel)
- [11-15-1373](#), "Updated Box5 Calibration Results," Narendar Madhavan (Toshiba)
- [11-15-1375](#), "11ax Support for IoT - Requirements and Technological Implications," Shimo Shilo (Huawei)

Goals for the January 2016 session

- Continue to advance TG documents based on submissions.
 - Priority to the TG Specification Framework document.
- TG timeline indicates draft D0.1 will be available in January 2016.
- Technical Presentations.

Teleconferences

One teleconference is planned before the January 2016 session.

Thursday	December 10 th , 2015	10:00 - 12:00 (ET)
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September 2015 — Bangkok, Thailand

The TGax originally planned to have 10 sessions during the week.
However, two more sessions are added due to a large number of contributions.
Six out of twelve sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	TGax (full)
AM2	TGax (full)	TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (MU ad hoc) TGax (SR ad hoc)	TGax (PHY ad hoc) TGax (SR ad hoc)	TGax (full)
PM2		TGax (full)	TGax (full)	
PM3	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (MU ad hoc) TGax (SR ad hoc)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax

- [11-15-0987-06](#), TGax September 2015 Meeting Agenda
 - [11-15-1093-00](#), IEEE 802.11 TGax September 2015 Bangkok Meeting Minutes
 - [11-15-1190-00](#), TGax September 2015 Closing Report
 - TGax PHY ad hoc group
 - [11-15-1125-04](#), TGax PHY Ad Hoc September 2015 Meeting Agenda
 - [11-15-1205-00](#), September 2015 Bangkok TGax PHY Ad hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-15-1126-03](#), TGax MAC Ad Hoc September 2015 Meeting Agenda
 - [11-15-1130-02](#), Sep 2015 Bangkok TGax MAC Ad hoc Meeting Minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-15-1141-02](#), TGax MU Ad-hoc Agenda September 2015
 - [11-15-1160-00](#), September 2015 Bangkok TGax MU Ad Hoc Meeting Minutes
 - TGax Spatial Reuse (SR) ad hoc group
 - [11-15-1143-03](#), TGax Spatial Reuse Ad Hoc September 2015 Agenda
 - [11-15-1206-00](#), Minutes of the IEEE 802.11ax Spatial Reuse ad hoc group meeting - Bangkok, September 2015
-

Achievements

1. Passed a number of motions affecting all aspects of the TG Specification Framework

- PHY — 29 motions.
- MAC — 12 motions.
- Multi-User (MU) — 15 motions.
- Spatial Reuse (SR) — 4 motion.

2. TG Documents

- Latest revision of the Specification Framework is available
 - <https://mentor.ieee.org/802.11/dcn/15/11-15-0132-09-00ax-spec-framework.docx>
- Approved new revisions of the TGax Simulation Scenarios and Evaluation Methodology documents.
 - [Simulation Scenarios \(rev. 14\)](#)
 - [Evaluation Methodology \(rev. 10\)](#)
- Other documents
 - [TGax Channel Models](#)
 - [802.11ax Functional Requirements](#)

3. Technical Presentations

70 technical submissions have been covered during the week.

A list of the submissions is here which is also contained in the agenda document.

- **PHY** — 24 submissions
 - [11-15-0579](#), "Preamble Design and Auto-detection," Hongyuan Zhang (Marvell)
 - [11-15-0580](#), "11ax Coding Discussion," Hongyuan Zhang (Marvell)
 - [11-15-0602](#), "HE-LTF squence for UL MU-MIMO," Xiaogang Chen (Intel)
 - [11-15-0810](#), "HE PHY Padding and Packet Extension," Hongyuan Zhang (Marvell)
 - [11-15-0823](#), "Preamble Design and Auto-Detection for 11ax," Sungho Moon (Newracom)
 - [11-15-0826](#), "HE-SIG-A Transmission for Range Extension," Jiayin Zhang (Huawei)
 - [11-15-0853](#), "Extensible Preamble Format Design," Leonardo Lanante (Kyutech)
 - [11-15-1031](#), "DL MU Signaling," Katsuo Yunoki (KDDI)
 - [11-15-1051](#), "HE NDP frame for sounding," Young Hoon Kwon (Newracom)
 - [11-15-1059](#), "SIG-B Encoding Structure Part II," Ron Porat (Broadcom)
 - [11-15-1066](#), "HE-SIG-B Contents," Kaushik Josiam (Samsung)
 - [11-15-1068](#), "Reliable Transmission Scheme for HE-SIG-B and Data," Jianhan Liu (MediaTek)

- [11-15-1070](#), "1024 QAM Proposal," Eunsung Park (LG Electronics)
- [11-15-1071](#), "Tone Grouping Factors and NDP format for 11ax," Sameer Vermani (Qualcomm)
- [11-15-1075](#), "Number of BSS Color bits," Junichi Iwatani (NTT)
- [11-15-1077](#), "HE-SIG-A Content," Jiayin Zhang (Huawei)
- [11-15-1088](#), "LTF Design for Uplink MU-MIMO," Daewon Lee (Newracom)
- [11-15-1089](#), "Considerations on PHY Padding and Packet Extension in 11ax," Yujin Noh (Newracom)
- [11-15-1091](#), "Considerations on Range Extension with SIG-A Repetition," Yujin Noh (Newracom)
- [11-15-1092](#), "Support of 1x/2x/4x OFDM Symbol in HE SU PPDU," Heejung Yu (Yeungnam Univ.)
- [11-15-1106](#), "SIG-B Structure," Reza Hedayat (Newracom)
- [11-15-1111](#), "SIG-B Resource Unit Allocation Coding," Amin Jafarian (Newracom)
- [11-15-1119](#), "Discussions on HE SIG-A Structure," John Son (Wilus Institute)
- [11-15-1122](#), "Identifiers in HE PPDUs for power saving," Alfred Asterjadhi (Qualcomm)
- **MAC** — 18 submissions
 - [11-15-1013](#), "802.11ae & 802.11ax," Guido R. Hiertz (Ericsson)
 - [11-15-1014](#), "Multiple BSSID Element," Guido R. Hiertz (Ericsson)
 - [11-15-1015](#), "Proxy ARB in 802.11ax," Guido R. Hiertz (Ericsson)
 - [11-15-1033](#), "Data field in HE PPDU," Yongho Seok (Newracom)
 - [11-15-1034](#), "Notification of Operating Mode Changes," Yongho Seok (Newracom)
 - [11-15-1044](#), "Further Study of 11ax Multicast," Kazuyuki Sakoda (Sony)
 - [11-15-1052](#), "Bandwidth for UL MU transmission," Young Hoon Kwon (Newracom)
 - [11-15-1060](#), "Receive Operating Mode Indication for Power Save," Eric Wong (Apple)
 - [11-15-1063](#), "11ax Channel access procedure," Chao-Chun Wang (MediaTek)
 - [11-15-1067](#), "MU TXOP truncation," Jeongki Kim (LG Electronics)
 - [11-15-1096](#), "Recovery Procedures in Cascading Sequences," John Son (Wilus Institute)
 - [11-15-1098](#), "ACK/BA frame for UL MU under cascading structure," Narendar Madhavan (Toshiba)
 - [11-15-1114](#), "Airtime Analysis of EDCA," Sean Coffey (RealTek)
 - [11-15-1115](#), "High Efficiency in Accessing the Medium," Sean Coffey (RealTek)
 - [11-15-1116](#), "Trigger Frame Channel Access," Jinsoo Ahn (Yonsei Univ.)
 - [11-15-1120](#), "Buffer Status Report," Alfred Asterjadhi (Qualcomm)
 - [11-15-1121](#), "HE A-Control field," Alfred Asterjadhi (Qualcomm)
 - [11-15-1137](#), "Triggered OFDMA Random Access Observations," Russell Huang (MediaTek)
- **Multi-User (MU)** — 15 submissions
 - [11-15-1043](#), "Overall Protocol of UL MU BA for Multicast Transmission," Kazuyuki Sakoda (Sony)
 - [11-15-1047](#), "RU selection process upon TF-R reception," Stephane Baron (Canon)
 - [11-15-1053](#), "Multiuser Block ACK Request (MU-BAR)," Guoqing Li (Apple)
 - [11-15-1057](#), "Multiple Resource Unit Allocation for TGax OFDMA," Kome Oteri (InterDigital)
 - [11-15-1062](#), "NAV Consideration for UL MU Response to Trigger frame," Po-Kai Huang (Intel)
 - [11-15-1065](#), "11ax uplink Multi-TID aggregation," Chao-Chun Wang (MediaTek)
 - [11-15-1086](#), "Consideration on multi-STA BA frame indication," Jing Ma (NICT)
 - [11-15-1097](#), "Reducing Channel Sounding Protocol Overhead for 11ax," Narendar Madhavan (Toshiba)
 - [11-15-1102](#), "Fragmentation with MU Operation," Chittabrata Ghosh (Intel)
 - [11-15-1103](#), "DL Sounding Sequence with UL MU Feedback," Chittabrata Ghosh (Intel)
 - [11-15-1105](#), "UL OFDMA-based Random Access Procedure," Chittabrata Ghosh (Intel)
 - [11-15-1107](#), "Power Save with Random Access," Chittabrata Ghosh (Intel)
 - [11-15-1117](#), "Regarding UL MU protection," Woojin Ahn (Yonsei Univ.)
 - [11-15-1123](#), "Acknowledgement to DL MU," Liwen Chu (Marvell)
 - [11-15-1129](#), "Feedback overhead in DL-MU-MIMO," Filippo Tosato (Toshiba)
- **Spatial Reuse (SR)** — 12 submissions
 - [11-15-1045](#), "Dynamic CCA control and TPC Simulation Results with SS1-SS3," Takeshi Itagaki (Sony)

- [11-15-1058](#), "CCA consideration for UL MU transmission," Kiseon Ryu (LG Electronics)
- [11-15-1069](#), "Adaptive CCA and TPC," James Wang (MediaTek)
- [11-15-1081](#), "Further consideration on receive behaviour based on the cascading structure and the BSS color scheme," Jing Ma (NICT)
- [11-15-1082](#), "Analysis of BSS and ESS Structure During Concurrent SR Transmissions," Chuck Lukaszewski (Aruba/HP)
- [11-15-1083](#), "Cost/Benefit Analysis of SR Techniques," Chuck Lukaszewski (Aruba/HP)
- [11-15-1101](#), "DSC/DCCA Calibration with TGax Agreed Scenarios," Masahito Mori (Sony)
- [11-15-1104](#), "TXOP Considerations for Spatial Reuse," Reza Hedayat (Newracom)
- [11-15-1109](#), "OBSS NAV and PD Threshold Rule for Spatial Reuse," Rossi Jun Luo (Huawei)
- [11-15-1110](#), "BSS TXOP," Amin Jafarian (Newracom)
- [11-15-1118](#), "Discussions on Spatial Reuse Enhancement," Geonjung Ko (WILUS)
- [11-15-1138](#), "To DSC or not to DSC," Filip Mestanov (Ericsson)
- **Simulation, calibration, and other submissions** — 12 submissions
 - [11-15-1039](#), "Spatial Reuse Measurements," Chuck Lukaszewski (Aruba Networks, a HP company)
 - [11-15-1046](#), "MAC calibration results," Stephane Baron (Canon)
 - [11-15-1048](#), "On TGax Scenario 4 channel model," Marcin Filo (Univ. of Surrey)
 - [11-15-1049](#), "Implications of wrap-around for TGax Scenario 3 and Scenario 4," Marcin Filo (Univ. of Surrey)
 - [11-15-1056](#), "Clarifying Link Level Simulator Assumptions," Kome Oteri (InterDigital)
 - [11-15-1087](#), "MU BFee Interference channel feedback," Sigurd Schelstraete (Quantenna)
 - [11-15-1095](#), "OFDMA performance in 11ax," Suhwook Kim (LG Electronics)
 - [11-15-1099](#), "Power Save Simulation Results," Hyeyoung Choi (LG Electronics)
 - [11-15-1100](#), "Discussion on Deep and Shallow Sleep States," Chittabrata Ghosh (Intel)
 - [11-15-1113](#), "Box5 Calibration results," Vida Ferdowsi (Newracom)
 - [11-15-1134](#), "11ax Support for IoT," Shimi Shilo (Huawei)
 - [11-15-1135](#), "Results for SS6 calibration case for single BSS and OBSS," Esa Tuomaala (Nokia)

Goals for the November 2015 session

- Continue to advance TG documents based on submissions.
 - Priority to the TG Specification Framework document.
 - Technical Presentations.
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Teleconferences

Three teleconferences are scheduled after the November 2015 session.

Thursday	October 15 th , 2015	10:00 - 12:00 (ET)
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July 2015 — Waikoloa, HI

TGax originally planned to have nine sessions during the week.

Two more sessions were added during the mid-week plenary session (marked red).

Four out of eleven sessions were ad hoc sessions.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full, ad hoc)			TGax (full)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		TGax (full)
PM1	TGax (full)	TGax (MU ad hoc) TGax (SR ad hoc)	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (full)
PM2			TGax (PHY ad hoc) TGax (MU ad hoc)	TGax (full)
PM3		TGax (full)		

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-15-0735-05](#), TGax July 2015 Meeting Agenda
 - [11-15-0884-00](#), IEEE 802.11 TGax July 2015 Waikoloa Meeting Minutes
 - [11-15-0963-00](#), TGax July 2015 Closing Report
 - TGax PHY ad hoc group
 - [11-15-0898-03](#), TGax PHY Ad Hoc July 2015 Meeting Agenda
 - [11-15-0913-00](#), July 2015 Hawaii TGax PHY Ad hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-15-0888-02](#), TGax MAC Ad Hoc July 2015 Meeting Agenda
 - [11-15-922-01](#), July 2015 Hawaii TGax MAC Ad hoc Meeting Minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-15-0899-02](#), TGax MU Ad-hoc Agenda July 2015
 - [11-15-0949-01](#), July 2015 Hawaii TGax MU Ad Hoc Meeting Minutes
 - TGax Spatial Reuse (SR) ad hoc group
 - [11-15-0911-01](#), TGax Spatial Reuse Ad Hoc July 2015 Agenda
 - [11-15-0971-01](#), Minutes of the IEEE 802.11ax Spatial Reuse ad hoc group meeting - Hawaii, July 2015

Achievements

1. **Passed a number of PHY, MAC and MU motions affecting the TGax Specification Framework**
 - PHY — SIG-A, SIG-B, Pilots, etc.
 - MAC — Trigger frame, etc.
 - Multi-User (MU) — Trigger frame for random access, MU CTS, etc.
2. **TG Documents**
 - Latest revision of the Specification Framework (rev. 7) is available.
 - <https://mentor.ieee.org/802.11/dcn/15/11-15-0132-07-00ax-spec-framework.docx>
 - Approved new revisions of the TGax Simulation Scenarios and Evaluation Methodology documents.
 - [Simulation Scenarios \(rev. 14\)](#)
 - [Evaluation Methodology \(rev. 10\)](#)
 - Other documents
 - [TGax Channel Models](#)
 - [802.11ax Functional Requirements](#)
3. **Technical Presentations**

More than 70 technical submissions have been covered during the week.

A list of the submissions is here which is also contained in the agenda document.

◦ **PHY** — 23 submissions

- [11-15-0579](#), "preamble design and autodetection," Hongyuan Zhang (Marvell)
- [11-15-0580](#), "11ax coding discussion," Hongyuan Zhang (Marvell)
- [11-15-0602](#), "HE-LTF sequence for UL MU-MIMO," Qinghua Li (Intel)
- [11-15-0805](#), "SIG-B field for HEW PPDU," Young Hoon Kwon (Newracom)
- [11-15-0810](#), "HE PHY Padding and Packet Extension," Hongyuan Zhang (Marvell)
- [11-15-0812](#), "Pilot Design for Data Section," Sameer Vermani (Qualcomm)
- [11-15-0813](#), "CP Indication for UL MU Transmission," Zhigang Rong (Huawei)
- [11-15-0816](#), "Interleaver and Tone Mapper for OFDMA," Yakun Sun (Marvell)
- [11-15-0817](#), "P Matrix for HE-LTF," Yakun Sun (Marvell)
- [11-15-0819](#), "11ax OFDMA Tone Plan Leftover Tones and Pilot Structure," Bin Tian (Qualcomm)
- [11-15-0821](#), "HE SIG-B Structure," Joonsuk Kim (Apple)
- [11-15-0822](#), "SIG-A Structure in 11ax Preamble," Jianhan Liu (MediaTek)
- [11-15-0823](#), "Preamble Design and Auto-Detection for 11ax," Sungho Moon (Newracom)
- [11-15-0824](#), "Pilot Design for 11ax Downlink Transmissions," Yujin Noh (Newracom)
- [11-15-0826](#), "HE-SIG-A transmission for range extension," Jiayin Zhang (Huawei)
- [11-15-0827](#), "Considerations on HE-SIG-A and B," Katsuo Yunoki (KDDI Labs)
- [11-15-0832](#), "Performance evaluation of SU/MU MIMO in OFDMA," Jiayin Zhang (Huawei)
- [11-15-0845](#), "LTF Design for Uplink MU-MIMO," Daewon Lee (Newracom)
- [11-15-0853](#), "Extensible Preamble Format Design," Leonardo Lanante (Kyushu Institute of Technology)
- [11-15-0865](#), "Discussion of ACI performance and ACI requirements for IEEE 802.11ax," Leif Wilhelmsson (Ericsson AB)
- [11-15-0868](#), "Impact of Frequency Selective Scheduling Feedback for OFDMA," Hakan Persson (Ericsson)
- [11-15-0873](#), "SIG-B Encoding Structure," Ron Porat (Broadcom)
- [11-15-0887](#), "Efficient padding for last OFDM symbol," Heejung Yu (Newracom)

◦ **MAC** — 14 submissions

- [11-15-0615](#), "DL OFDMA Bandwidth," Liwen Chu (Marvell)
- [11-15-0803](#), "Frame Collision Information Management," Peng Shao (NEC Communication Systems)
- [11-15-0831](#), "Broadcast and Unicast (Trigger) in DL MU," Liwen Chu (Marvell)
- [11-15-0841](#), "Cascading Structure," David Xun Yang (Huawei Technologies)
- [11-15-0851](#), "HE Trigger Frame Format," John Son (WILUS Institute)
- [11-15-0856](#), "Compressed Uplink Trigger Frame," Vida Ferdowsi (Newracom)
- [11-15-0871](#), "Efficiency enhancement for 802.11ax," Guido R. Hiertz (Ericsson)
- [11-15-0872](#), "802.11ai and 802.11ax," Guido R. Hiertz (Ericsson)
- [11-15-0874](#), "Minimal data rates management frame transmissions in 2.4 GHz," Guido R. Hiertz (Ericsson)
- [11-15-0876](#), "Duration and MAC Padding for MU PPDU," Simone Merlin (Qualcomm)
- [11-15-0877](#), "Trigger Frame Format," Simone Merlin (Qualcomm)
- [11-15-0878](#), "Issues on Trigger Frame Retransmission," Jinsoo Ahn (Yonsei Univ.)
- [11-15-0880](#), "Scheduled Trigger frames," Alfred Asterjadhi (Qualcomm)
- [11-15-0914](#), "Enlarged minimal contention window size," Guido R. Hiertz (Ericsson)

◦ **Multi-User (MU)** — 13 submissions

- [11-15-0800](#), "Multiplexing of Acknowledgements for Multicast Transmission," Yusuke Tanaka (Sony)
- [11-15-0806](#), "Protection for MU transmission," Young Hoon Kwon (Newracom)
- [11-15-0818](#), "Further Analysis of Feedback and Frequency Selective Scheduling (FSS) for TGax OFDMA," Kome Oteri (InterDigital Communication)
- [11-15-0829](#), "Uplink ACK and BA Multiplexing," Reza Hedayat (Newracom)
- [11-15-0843](#), "UL MU OFDMA analysis," Yonggang Fang (ZTE)
- [11-15-0852](#), "Transmission Interval of Trigger Frames," Leonardo Lanante (Kyushu Institute of Technology)

- [11-15-0854](#), "DL OFDMA Signalling," Tomoko Adachi (Toshiba)
- [11-15-0855](#), "How to collect STAs' Tx demands for UL MU," Tomoko Adachi (Toshiba)
- [11-15-0858](#), "MU BFee Interference channel feedback," Sigurd Schelstraete (Quantenna)
- [11-15-0859](#), "A mechanism for incremental updates to MU precoding," Sigurd Schelstraete (Quantenna)
- [11-15-0867](#), "MU-RTS/CTS for DL MU," Po-kai Huang (Intel)
- [11-15-0875](#), "Random Access with Trigger Frames using OFDMA," Chittabrata Ghosh (Intel)
- [11-15-0881](#), "Regarding buffer status of UL-STAs in UL-OFDMA," Woojin Ahn (Yonsei Univ.)
- **Spatial Reuse (SR)** — 8 submissions
 - [11-15-0797](#), "NAV Operation for Spatial Reuse," Yongho Seok (Newracom)
 - [11-15-0801](#), "DCCA/DSC Reference Simulation Results," Masahito Mori (Sony)
 - [11-15-0804](#), "Outdoor Enterprise Scenario and DSC," Graham Smith (SR Technologies)
 - [11-15-0807](#), "DSC Summary," Graham Smith (SR Technologies)
 - [11-15-0811](#), "Topics for Consideration for Spatial Reuse," Xiaofei Wang (InterDigital)
 - [11-15-0882](#), "DSC leveraging uplink RTS/CTS control," M. Shahwaiz Afaqui (Technical University of Catalonia)
 - [11-15-0883](#), "Follow Up Discussion on The Receiver Behavior," Yasuhiko Inoue (NTT)
 - [11-15-0886](#), "DSC Calibration Results," Chinghwa Yu (MediaTek)
- **Simulation, calibration, and others** — 13 submissions
 - [11-15-0754](#), "WLAN Packet traffic and efficiency analysis," Jim Lansford (CSR)
 - [11-15-0781](#), "Summary of Power Save Calibration Results," Eric Wong (Apple)
 - [11-15-0787](#), "Power Save Calibration Results," Eric Wong (Apple)
 - [11-15-0788](#), "Box 1 and Box 2 calibration results," Takeshi Itagaki (Sony)
 - [11-15-0789](#), "Proposed Changes to Evaluation Methodologies," Allan Jones (Activision)
 - [11-15-0802](#), "Box5 Calibration Results of SS6," Jiyong Pang (Huawei)
 - [11-15-0814](#), "Simulation Results for Box5 Calibration," Ke Yao (ZTE)
 - [11-15-0833](#), "Calibration results for PSP and UAPSD for 20, 40 and 80MHz bands," Dmitry Akhmetov (Intel)
 - [11-15-0680](#), "Reference Box5 Calibration Assumptions and Parameters," Jiyong Pang (Huawei)
 - [11-15-0849](#), "Simulation Results for Box5 Calibration," Rongzhen Yang (Intel)
 - [11-15-0869](#), "OFDMA and VoIP Capacity," Hakan Persson (Ericsson)
 - [11-15-0870](#), "802.11ax in 2.4 GHz," Guido R. Hiertz (Ericsson)
 - [11-15-0885](#), "Box 5 Calibration Results," ChingHwa Yu (MediaTek)

Goals for the September 2015 session

- Continue to advance TG documents based on submissions.
 - Priority to the TG Specification Framework document.
 - Technical Presentations.
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Teleconferences

Three teleconferences are planned before the September 2015 meeting.

Thursday	August 20 th , 2015	10:00 - 12:00 (ET)
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May 2015 — Vancouver, BC, Canada

The TGax had 10 sessions during the week.

Six out of ten sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1				TGax (full)
AM2	TGax (full)	TGax (MU ad hoc) TGax (SR ad hoc)		
PM1	TGax (PHY ad hoc) TGax (MAC ad hoc)	TGax (PHY ad hoc) TGax (SR ad hoc)	TGax (PHY ad hoc) TGax (MU ad hoc)	TGax (full)
PM2			TGax (full)	
PM3	TGax (full)			

Main documents

The meeting agenda and minutes of the TGax and its subgroups, and the TGax closing report can be found here.

- TGax
 - [11-15-0500-08](#), TGax May 2015 Meeting Agenda
 - [11-15-0622-00](#), TGax May 2015 Vancouver Meeting Minutes
 - [11-15-0692-01](#), TGax May 2015 Closing Report
 - TGax PHY ad hoc group
 - [11-15-0640-04](#), TGax PHY Ad Hoc May 2015 Meeting Agenda
 - [11-15-0651-02](#), May 2015 Vancouver TGax PHY Ad hoc Meeting Minutes
 - TGax MAC ad hoc group
 - [11-15-0599-02](#), TGax MAC Ad Hoc May 2015 Meeting Agenda
 - [11-15-0637-00](#), May 2015 Vancouver TGax MAC Ad hoc Meeting Minutes
 - TGax Multi-User (MU) ad hoc group
 - [11-15-0645-01](#), TGax MU Ad-hoc Agenda May 2015
 - [11-15-0679-00](#), May 2015 Vancouver TGax MU Ad Hoc Meeting Minutes
 - TGax Spatial Reuse (SR) ad hoc group
 - [11-15-0650-02](#), TGax Spatial Reuse Ad Hoc May 2015 Agenda
 - [11-15-0662-01](#), Minutes of the IEEE 802.11ax Spatial Reuse ad hoc group meeting - Vancouver, May 2015

Achievements

1. **Passed a number of PHY, MAC and MU motions affecting the TGax Specification Framework**
 - PHY — SIG-A, SIG-B, Pilots, etc.
 - MAC — Trigger frame, etc.
 - Multi-User (MU) — Trigger frame for random access, MU CTS, etc.
2. **TG Documents**
 - Latest revision of the Specification Framework (rev. 7) is available.
 - <https://mentor.ieee.org/802.11/dcn/15/11-15-0132-07-00ax-spec-framework.docx>
 - Approved new revisions of the TGax Simulation Scenarios and Evaluation Methodology documents.
 - [Simulation Scenarios \(rev. 14\)](#)

- [Evaluation Methodology \(rev. 10\)](#)

- Other documents

- [TGax Channel Models](#)
- [802.11ax Functional Requirements](#)

3. Technical Presentations

More than 50 technical submissions have been covered during the week.

A list of the submissions is here which is also contained in the agenda document.

- **PHY** — 14 submissions

- [11-15-0550](#), "L-preamble issues for UL-OFDMA," Katsuo Yunoki (KDDI Labs)
- [11-15-0553](#), "Enhancing Performance of Hybrid-ARQ with Linear Constellation Precoding," Muhammad Mehboob Fareed (King Abdullah Univ. of Science and Technology)
- [11-15-0569](#), "Performance of 1x, 2x, and 4x HE-LTF," Kome Oteri (InterDigital)
- [11-15-0572](#), "Inefficiency of 256-FFT per 20MHz," Heejung Yu (Yeungnam Univ./Newracom)
- [11-15-0574](#), "SIG structure for UL PPDU," Young Hoon Kwon (Newracom)
- [11-15-0575](#), "Preamble Structure in 802.11ax," Yujin Noh (Newracom)
- [11-15-0577](#), "Pilot Design for 11ax," Daewon Lee (Newracom)
- [11-15-0579](#), "Preamble design and auto-detection," Hongyuan Zhang (Marvell)
- [11-15-0580](#), "11ax coding discussion," Hongyuan Zhang (Marvell)
- [11-15-0584](#), "Considerations on LTF Sequence Design," Sungho Moon (Newracom)
- [11-15-0600](#), "Non Uniform Constellations for 1024QAM," Daniel Schneider (Sony)
- [11-15-0602](#), "HE-LTF sequence for UL MU-MIMO," Qinghua Li (Intel)
- [11-15-0621](#), "Design Principles for HE Preamble," John Son (WILUS)
- [11-15-0381](#), "HE-STF Proposal," Yakun Sun (Marvell)

- **MAC** — 6 submissions

- [11-15-0567](#), "Multi-STA BA for SU Transmissions," Xiaofei Wang (InterDigital)
- [11-15-0604](#), "Random Access with Trigger Frames using OFDMA," Chittabrata Ghosh (Intel)
- [11-15-0611](#), "Multi-STA Block ACK Protection," Jinsoo Ahn (Yonsei Univ.)
- [11-15-0615](#), "UL OFDMA Bandwidth," Liwen Chu (Marvell)
- [11-15-0617](#), "Duration and MAC Padding for UL MU PPDU," Gang Ding (Qualcomm)
- [11-15-0626](#), "Further consideration for Multi-STA Block ACK frame," Jeongki Kim (LG)

▪

- **Multi-User (MU)** — 7 submissions

- [11-15-0378](#), "Channel Sensing in UL OFDMA," Reza Hedayat (Newracom)
- [11-15-0568](#), "Frequency Selective Scheduling (FSS) for TGax OFDMA," Kome Oteri (InterDigital)
- [11-15-0586](#), "Frequency Diversity Options in OFDMA," Reza Hedayat (Newracom)
- [11-15-0587](#), "Uplink ACK and BA Multiplexing," Reza Hedayat (Newracom)
- [11-15-0597](#), "Beamformed HE PPDU," Yongho Seok (Newracom)
- [11-15-0608](#), "Regarding trigger frame in UL MU," Tomo Adachi (Toshiba)
- [11-15-0612](#), "Multi Channel availability for UL-OFDMA," Woojin Ahn (Yonsei Univ.)

- **Spatial Reuse (SR)** — 5 submissions

- [11-15-0543](#), "Simulation Scenario changes for Frequency Re-use," Graham Smith (SR Technologies)
- [11-15-0544](#), "Proposed text additions to 14/980 for frequency re-use," Graham Smith (SR Technologies)
- [11-15-0548](#), "Enterprise Scenario and DSC," Graham Smith (SR Technologies)
- [11-15-0588](#), "CCA revisited II," Amin Jafarian (Newracom)
- [11-15-0595](#), "Discussion on The Receiver Behavior for CCAC/DSC with BSS Color," Yasuhiko Inoue (NTT)

- **Simulation, calibration, and others** — 18 submissions

- [11-15-0551](#), "OBSS Preamble Detection," Suhwook Kim (LG Electronics)
- [11-15-0552](#), "IEEE 802.11 performance in dense, cellular-like, outdoor deployments," Richard Edgar (Imagination Technologies)

- [11-15-0330](#), "OFDMA Numerology and Structure," Sharnaz Azizi (Intel)
- [11-15-0583](#), "OBSS Preamble Error Probability," Jiyong Pan (Huawei)
- [11-15-0590](#), "Traffic Model Updates to Evaluation Methodology," Phil Barber (Huawei)
- [11-15-0674](#), "Joint submission for Box 5 Calibration," Suhwook Kin (LG Electronics)
- [11-15-0581](#), "LSP Correlation Clarification for Scenario 4," Daewon Lee (Newracom)
- [11-15-0582](#), "Clarifications to Box 2 MIMO simulation calibrations," Daewon Lee (Newracom)
- [11-15-0373](#), "Mixed traffic configurations on simulation scenarios," Yingpei Lin (Huawei)
 - Not presented since the contents of this submission was merged into 11-15-0590.
- [11-15-0610](#), "Simulation Results for Box 5 Calibration," Vida Ferdowsi (Newracom)
- [11-15-0613](#), "Box 5 Calibration Result," Chinghwa Yu (MediaTek)
- [11-15-0623](#), "TGax simulation scenario "Box 5" - calibration results," Guido Hiertz (Ericsson)
- [11-15-0316](#), "Power Save Calibrations," Hyeyoung Choi (LG Electronic)
- [11-15-0564](#), "802.11ax Calibration and Modeling Adjacent Channel Interference," Naveen Kakani (CSR)
- [11-15-0576](#), "Latency and Power Consumption in State Transitions," Chittabrata Ghosh (Intel)
- [11-15-0592](#), "More Power Save Calibration Results," Eric Wong (Apple)
- [11-15-0598](#), "U-APSD Enhancement for HE," Jarkko Knecht (Nokia)
- [11-15-0603](#), "Calibration Results for PSP and U-APSD," Chittabrata Ghosh (Intel)

Goals for the July 2015 session

- Continue to advance TG documents based on submissions.
 - Expectation is more submissions affecting the TG specification framework document will be considered.
- Technical Presentations.

Teleconferences

Three teleconferences are planned before the July 2015 session.

Thursday	June 18 th , 2015	10:00 - 12:00 (ET)
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March 2015 — Berlin, Germany

TGax originally planned nine sessions during the week.

However, one more session was added (Wednesday PM2).

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (full, ad hoc)		TGax (MU ad hoc) TGax (SR ad hoc)	TGax (full)
AM2		TGax (PHY ad hoc) TGax (MAC ad hoc)		
PM1	TGax (full)	TGax (full)	TGax (full)	TGax (full)
PM2			TGax (full)	
PM3		TGax (full)		

Main documents

The meeting agenda, minutes, and closing report of the TGax can be found here.

- [11-15-0235-08](#), TGax March 2015 Meeting Agenda
- [11-15-0309-01](#), TGax March 2015 Berlin Meeting Minutes
- [11-15-0465-00](#), TGax March 2015 Closing Report

Achievements

1. Passed a number of PHY, MAC and MU motions affecting the TGax Specification Framework

- PHY — LTF and SIG-B design.
- MAC — Multi-User Block Ack and Multi-User procedures.
- Multi-User (MU) — Ack multiplexing.
- etc.

2. TG Documents

- Approved new revisions of the TGax Simulation Scenarios and Evaluation Methodology documents.
 - [Simulation Scenarios \(rev. 9\)](#)
 - [Evaluation Methodology \(rev. 8\)](#)
- Other documents
 - [TGax Channel Models](#)
 - [802.11ax Functional Requirements](#)

3. Technical Presentations

Following technical submissions have been covered during the week.

- **PHY** — 12 submissions
 - [11-15-0305](#), "Effective Subcarrier Assignment for DL-OFDMA," Katsuo Yunoki (KDDI R&D Laboratories)
 - [11-15-0330](#), "OFDMA Numerology and Structure," Shahrnaz Azizi (Intel Corporation)
 - [11-15-0344](#), "SIG field design principle for 11ax," Young Hoon Kwon (Newracom)
 - [11-15-0349](#), "HE-LTF Proposal," Hongyuan Zhang (Marvell)
 - [11-15-0358](#), "Numerology for 11ax," Daewon Lee (Newracom)
 - [11-15-0360](#), "Preamble Auto-Detection for 802.11ax," Sungho Moon (NEWRACOM)
 - [11-15-0364](#), "11ax Preamble design: training sequence," Sigurd Schelstraete (Quantenna)
 - [11-15-0375](#), "Minimum Resource Granularity in OFDMA," John Son (WILUS Institute)
 - [11-15-0378](#), "Channel Sensing in UL OFDMA," Reza Hedayat (Newracom)
 - [11-15-0380](#), "Discussion on OFDMA scheduling for 802.11ax," Le Liu (Huawei Technologies)
 - [11-15-0381](#), "HE-STF Proposal," Yakun Sun (Marvell)
 - [11-15-0383](#), "Impact of number of sub-channels in OFDMA," Leif Wilhelmsson (Ericsson)
- **MAC** — 6 submissions
 - [11-15-0320](#), "GCR-BA with Measurement Report Performance in OBSS," Yuichi Morioka (SONY)
 - [11-15-0336](#), "MAC Overhead Analysis of MU Transmissions," Xiaofei WANG (InterDigital)
 - [11-15-0362](#), "Beacon Transmission Issues," Yonggang Fang (ZTE)
 - [11-15-0365](#), "UL MU Procedure," Kiseon Ryu (LG Electronics)
 - [11-15-0366](#), "Multi-STA BA," Simone Merlin (Qualcomm)
 - [11-15-0376](#), "UL-MU MAC Throughput Under Non-Full Buffer Traffic," Tatsumi Uwai (Radrix Co. Ltd)
- **Multi-User (MU)** — 9 submissions
 - [11-15-0331](#), "Uplink Multi-User MIMO Protocol Design," Yongho Seok (NEWRACOM)
 - [11-15-0333](#), "Throughput Comparison of Some Multi-user Schemes in 802.11ax," Kome Oteri (InterDigital)
 - [11-15-0336](#), "MAC Overhead Analysis of MU Transmissions," Xiaofei WANG (InterDigital)

- [11-15-0353](#), "OFDMA Non-contiguous Channel Utilization," Jinsoo Ahn (Yonsei univ.)
- [11-15-0354](#), "Bandwidth granularity on UL-OFDMA data allocation," Woojin Ahn (Yonsei Univ.)
- [11-15-0363](#), "UL MU Synchronization Requirements," Yonggang Fang (ZTE)
- [11-15-0377](#), "Considerations on UL MU Resource Scheduling," Leonardo Lanante (Kyutech)
- [11-15-0379](#), "DL OFDMA Performance and ACK Aggregation," Reza Hedayat (Newracom)
- [11-15-0384](#), "Discussion on DL-OFDMA Sub-channel Indication Method," Yu Cai (Lenovo)
- **Spatial Reuse (SR)** — 7 submissions
 - [11-15-0300](#), "Potential of Modified Signal Detection Thresholds," Gustav Wikstrom (Ericsson AB)
 - [11-15-0318](#), "CCA Regime Evaluation Revisited," Amin Jafarian (Newracom Inc.)
 - [11-15-0319](#), "Impact of TPC coupled to DSC for legacy unfairness issue," Masahito Mori (Sony)
 - [11-15-0338](#), "Discussions on the Definition of CCA Threshold," Akira Kishida (NTT)
 - [11-15-0367](#), "OBSS preamble detection," Gwen Barriac (Qualcomm)
 - [11-15-0371](#), "Proposal and simulatin based evaluation of DSC-AP Algorithm," Eduard Garcia-Villegas (UPC)
 - [11-15-0374](#), "Further Considerations on Legacy Fairness with Enhanced CCA," John Son (WILUS Institute)
- **Simulation, calibration, and others** — 24 submissions
 - [11-14-1392](#), "Simulation results for Box-5 calibration," Suhwook Kim (LG Electronics)
 - [11-14-1434](#), "SLS Box4 Calibration Results," Russell Huang (MediaTek Inc.)
 - [11-15-0053](#), "Box5 Results of 11ac SS6," Jiyong Pang 华为Huawei)
 - [11-15-0072](#), "U-APSD power saving calibration results," Yanchun Li (Huawei)
 - [11-15-0125](#), "Box 1 and Box 2 Calibration Results," Ron Porat (Broadcom)
 - [11-15-0304](#), "Evaluating Power Save Performance," Joonsuk Kim (Apple)
 - [11-15-0306](#), "Power Save Mode Calibration Results," Eric Wong (Apple)
 - [11-15-0307](#), "MAC calibration results for Test 4," Ke Yao (ZTE Corp.)
 - [11-15-0308](#), "Simulation results for box 5," Ke Yao (ZTE Corp.)
 - [11-15-0314](#), "Sleep States in IEEE 802.11ax Simulation Scenarios," Chittabrata Ghosh (Intel)
 - [11-15-0316](#), "Power Save Calibration," Hyeyoung Choi (LG)
 - [11-15-0326](#), "U-APSD Enhancements for HE," Jarkko Kneckt (Nokia)
 - [11-15-0327](#), "Microsleep for HE STA," Jarkko Kneckt (Nokia)
 - [11-15-0343](#), "In Situ Frame Size Measurements," Chuck Lukaszewski (Aruba Networks)
 - [11-15-0351](#), "Empirical Measurements of Channel Degradation Under Load," Chuck Lukaszewski (Aruba Networks)
 - [11-15-0357](#), "Scenario 1 CCA Simulation," Knut Odman (Broadcom Corporation)
 - [11-15-0359](#), "Clarification of MIMO Box2 calibration," Jaehyun Ahn (Newracom)
 - [11-15-0368](#), "Box 5 results for Single BSS Calibration Case," Esa Tuomaala (Nokia)
 - [11-15-0369](#), "MAC calibration test 4 simulation results," Enrico-Henrik Rantala (Nokia)
 - [11-15-0370](#), "MAC Calibration Results," Guoqing Li (Apple)
 - [11-15-0372](#), "Corrections on Reference Traffic Profile for Scenario 2 in Simulation Scenarios Document," Yingpei Lin (Huawei)
 - [11-15-0373](#), "Mixed traffic configurations on simulation scenarios," Yingpei Lin (Huawei)
 - [11-15-0382](#), "MAC calibration test 4 simulation results," Yanchun Li (Huawei)
 - [11-15-0441](#), "Proposed text to TGax Simulation Scenarios MAC test 4," Enrico-Henrik Rantala (Nokia)

Goals for the May 2015 session

- Continue to advance TG documents based on submissions.
 - Expectation is more submissions affecting the TG specification framework document will be considered.
 - Technical Presentations.
-

Teleconferences

Three teleconferences are planned before the May 2015 session.

Thursday	April 9 th , 2015	10:00 - 12:00 (ET)
Thursday	April 30 th , 2015	20:00 - 22:00 (ET)

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January 2015 — Atlanta, GA

The TGax planned to have 9 sessions during the week.

One session (Thursday PM2) was cancelled upon completion of the business.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax (full)	TGax (full)
AM2	TGax (full)	TGax (full)		
PM1	TGax (full)	TGax (full)	TGax (full)	TGax (Cancelled)
PM2				
PM3	TGax (full)			

Main documents

The meeting agenda, minutes, and closing report of the TGax can be found here.

- [11-14-1578-06](#), TGax January 2015 Meeting Agenda
- [11-15-0090-00](#), TGax January 2015 Atlanta Meeting Minutes
- [11-15-0186-00](#), TGax January 2015 Closing Report

Achievements

1. TG Structure

Co-chairs for the ad hoc groups are elected.

MAC	PHY	Multi-User (MU)	Spatial Reuse (SR)
Eric Wong (Apple)	Bo Sun (ZTE)	Sigurd Schelstraete (Quantenna)	Laurent Cariou (Orange)
Reza Hedayat (Newracom)	Jianhan Liu (MediaTek)	Kiseon Ryu (LG Electronics)	Guido R. Hiertz (Ericsson)
Brian Hart (Cisco)	Yakun Sun (Marvell)	Kaushik Josiam (Samsung)	Jae Seung Lee (ETRI)

2. TG Documents

- Passed a number of motions affecting the TG specification Framework.
- Approved new revisions of Simulation Scenarios and Evaluation Methodology TG documents.
 - TGax Simularion Scenarios ([11-14-0980-06](#))

- TGax Evaluation Methodology ([11-14-0571-07](#))

3. Technical Presentations

Here is the list of the submissions that the TGax received during the week.

◦ DSC and CCA

- [11-15-0025](#), "DSC and Roaming," Graham Smith (SR Technologies)
- [11-15-0027](#), "Simulation Based Evaluation DSC in residential scenario," M. Shahwaiz Afaqui (UPC)
- [11-15-0045](#), "Performance Analysis of BSS Color and DSC," Masahito Mori (Sony)
- [11-15-0050](#), "Modeling components impacting throughput gain from CCAT adjustment," Yu Wang (Ericsson AB)
- [11-15-0085](#), "Legacy Fairness Issues of Enhanced CCA," John Son (WILUS Institute)
- [11-15-0105](#), "Dynamic CCA Management," Sean Coffey (RealTek)

◦ OFDMA

- [11-15-0034](#), "DL-OFDMA Map Frame," Katsuo Yunoki (KDDI Labs)
- [11-15-0066](#), "Downlink OFDMA Protocol Design," Yongho Seok (Newracom)
- [11-15-0079](#), "OFDM Numerology for 11ax," Daewon Lee (Newracom)
- [11-15-0091](#), "UL-OFDMA Procedure in IEEE 802.11ax," Woojin Ahn (Yonsei Univ.)
- [11-15-0092](#), "DL-OFDMA Procedure in IEEE 802.11ax," Jinsoo Ahn (Yonsei Univ.)

◦ Multi-User (MU)

- 11-15-0010, "draft for integrated UL DL MU MIMO Frame Format," Tae-Yoon Kim (Korea Univ.) - Not presented
- 11-15-0029, "Discussion on integrated UL/DL MU-MIMO," Tae-Yoon Kim (Korea Univ.) - Not presented
- [11-15-0040](#), "Discussion on integrated UL-DL MU-MIMO-MAC," TaeYoon Kim (Korea Univ.)
- [11-15-0064](#), "Consideration on UL-MU overheads," Tomoko Adachi (Toshiba)
- [11-15-0086](#), "Uplink MU Transmission and Legacy Coexistence," Reza Hedayat (NEWRACOM)
- [11-15-0089](#), "MAC Efficiency Gain of Uplink Multi-user Transmission," Leonardo Lanante Jr (Kyushu Inst. of Tech.)

◦ MAC

- [11-15-0035](#), "Scalable Channel Utilization," Katsuo Yunoki (KDDI R&D Laboratories)
- [11-15-0037](#), "Structural Format Change," Kyonggi University
- [11-15-0046](#), "11aa GCR-BA Performance in OBSS," Yuichi Morioka (Sony)
- [11-15-0059](#), "Uplink RTS/CTS Control," Sigurd Schelstraete (Quantenna)

◦ PHY

- [11-15-0048](#), "Non-Uniform Constellations for Higher Order QAMs," Daniel Schneider (Sony)
- [11-15-0068](#), "Support of outdoor environments," Young Hoon Kwon (NEWRACOM)
- [11-15-0079](#), "OFDM Numerology for 11ax," Daewon Lee (NEWRACOM)
- [11-15-0081](#), "Considerations on 11ax Auto-detection Methods," Jaeyoung Song (KAIST)
- [11-15-0082](#), "Considerations on 11ax OFDMA Frequency Granularity," Young-bin Kim (KAIST)
- [11-15-0097](#), "Performance Analysis of Frequency Selective Scheduling," Ningbo Zhang (BUPT)
- [11-15-0099](#), "Payload Symbol Size for 11ax," Sriram Venkateswaran (Broadcom)
- [11-15-0101](#), "Preamble structure for 11ax system," Jiayin Zhang (Huawei)

◦ Simulation Scenarios and Evaluation Methodology

- [11-14-1342](#), "MAC Calibration Results," Igor Kim (ETRI)
- [11-14-1343](#), "Multicast Scenarios for MAC Calibration," Igor Kim (ETRI)
- [11-14-1392](#), "Simulation Results for Box-5 Calibration," Suhwook Kim (LGE)
- [11-14-1523](#), "Offline Discussion Minutes of SLS Calibration," Jiyong Pang (Huawei)
- [11-14-1590](#), "Multi-wall penetration loss model for HEW system level simulation," Kejun Zhao et al. (National Engineering Research Center for Broadband Networks & Applications)
- [11-14-1597](#), "PHY abstraction and performance for outdoor channel models," Kejun Zhao et al. (National Engineering Research Center for Broadband Networks & Applications)
- [11-15-0022](#), "MAC Calibration Results," Xiaofei Wang (InterDigital)
- [11-15-0044](#), "Proposed Changes to Simulation Scenarios," Masahito Mori (Sony)
- [11-15-0051](#), "Box5 Calibration Results," Jiyong Pang (Huawei)

- 11-15-0052, "Box5 Results of One BSS Case," Jiyong Pang (Huawei)
- [11-15-0053](#), "Box5 Results of 11ac SS6," Jiyong Pang (Huawei)
- [11-15-0061](#), "FPS Network Traffic Model," Allan Jones (Activision)
- [11-15-0065](#), "11ax EMD Revision Straw Poll," Jiyong Pang (Huawei)
- 11-15-0071, "MAC calibration test 4 results," Yanchun Li (Huawei)
- [11-15-0072](#), "U-APSD power saving calibration results," Yanchun Li (Huawei)
- [11-15-0073](#), "Simulation Results of Box5," Ke Yao (ZTE)
- [11-15-0078](#), "Clarification on calibration test cases," Guoqing Li (Apple)
- [11-15-0080](#), "MAC Calibration Results," Geonjung Ko (WILUS Institute)
- [11-15-0093](#), "Text Update on PHY Abstraction and SP," Yakun Sun (Marvell)
- [11-15-0103](#), "Power Save Calibration," Yarkko Kneckt (Nokia)
- [11-15-0104](#), "SLS MAC Test 4 Results," Chinghwa Yu (MediaTek)
- **Others**
 - [11-15-0043](#), "In-band Full Duplex Radios and System Performance," Kapseok Chang (ETRI)
 - [11-15-0075](#), "Operating Rules for TGax Ad Hoc groups," Osama Aboul-Magd (TGax chair)
 - [11-15-0076](#), "Field Sample OBSS and Client Data," Carol Ansley (ARRIS Group)

Goals for the March 2015 session

- Continue to advance TG documents based on submissions.
 - Expectation is more submissions affecting the TG specification framework document will be considered.
- Technical Presentations.

Teleconferences

Three teleconferences are planned before the March 2015 session.

Thursday	February 26 th , 2015	10:00 - 12:00 (ET)
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November 2014 — San Antonio, TX

The TGax originally planned to have 9 sessions during the week.

FourHowever, one session (Tuesday PM3) was cancelled.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax (ad hoc)			TGax
AM2		TGax		
PM1		TGax	TGax	TGax
PM2	TGax	TGax		
PM3		TGax (Cancelled)		

Main documents

The meeting agenda, minutes, and the closing report of TGax can be found here.

- [11-14-1319-07](#), TGax November 2014 Meeting Agenda
 - [11-14-1460-00](#), TGax November 2014 San Antonio Meeting Minutes
 - [11-14-1536-00](#), TGax November 2014 Closing Report
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Achievements

1. Discussions on the TG Structure

- The TG approved a motion to create four ad hoc groups.
 - PHY, MAC, Multi-User (MU) and Spatial Reuse (SR)
- The TG approved a motion to have 3 co-chairs for each of the ad hocs.
- Ad hoc chairs election is scheduled for January 2015 meeting on Tuesday.
- Ad hoc meetings will start on March 2015
- Robert Stacy (Intel) was appointed as the technical editor of the TGax.

2. TG Documents — The group approved updated documents.

- The group approved the first version of TGax Specification Framework document ([11-14-1453-02](#)).
- The group approved new revisions of the following documents.
 - TGax Simulation Scenarios ([11-14-0980-05](#))
 - TGax Evaluation Methodology ([11-14-0571-06](#)).

3. Technical Presentations

Here is the list of the 44 submissions that the TGax received.

- **Evaluation Methodology**
 - [11-14-1388](#), "Consideration on PER Prediction for PHY Abstraction," Bo Sun (ZTE Corp)
 - [11-14-1418](#), "Further Study of Time Varying Interference and PHY Abstraction," Yakun Sun (Marvell)
 - [11-14-1420](#), "The Impact of Preamble Error on MAC System Performance," Po-Kai Huang (Intel)
 - [11-14-1424](#), "Proposed Changes to Evaluation Methodology and Simulation Scenario," Yuichi Morioka (Sony)
 - [11-14-1440](#), "A Few Corrections to Video Traffic Model," Guoqing Li (Apple)
- **Simulation Scenarios and Calibration**
 - [11-14-1177](#), "Discussion about Box5 Calibration," Jiyong Pang (Huawei)
 - [11-14-1342](#), "MAC Calibration Results," Igor Kim (ETRI)
 - [11-14-1343](#), "Multicast Scenarios for MAC Calibration," Igor Kim (ETRI)
 - [11-14-1392](#), "Simulation results for Box 5 calibration," Suhwook Kim (LG Electronics)
 - [11-14-1402](#), "Box1 and Box3 calibration results," Masahito Mori (Sony)
 - [11-14-1419](#), "SLS Box5 Calibration Results and Discussions," Yakun Sun (Marvell)
 - [11-14-1434](#), "TGax SLS Box4 Calibration Results," Russell Huang (MediaTek Inc.)
 - [11-14-1441](#), "Simulation Setting of Box5 Calibration," Jiyong Pang (Huawei)
 - [11-14-1444](#), "Energy Efficiency Evaluation and Simulation Model," Chinghwa Yu (MediaTek)
 - [11-14-1449](#), "MAC Calibration Results," Newracom
 - [11-14-1450](#), "Box 0 calibration results," Hongsup Lee (Newracom)
 - [11-14-1451](#), "Box 1 and Box 2 Calibration Results," Jaehyun Ahn (Newracom)
- **Technology/Other**
 - [11-14-1228](#), "Issues on 256-FFT per 20MHz," Heejung Yu (NEWRACOM/YU)
 - [11-14-1380](#), "Efficiency Measurement for RTS/CTS," Katsuo Yunoki (KDDI R&D Laboratories)
 - [11-14-1381](#), "Novel RTS/CTS Procedure," Katsuo Yunoki (KDDI R&D Laboratories)
 - [11-14-1382](#), "Responses to the comments on doc.1169," Katsuo Yunoki (KDDI R&D Laboratories)
 - [11-14-1397](#), "Discussion on Frame Structure for Future WLAN Systems with OFDMA," Myeong-Jin Kim (Korea University)
 - [11-14-1403](#), "Performance Analysis of BSS Color and DSC," Masahito Mori (Sony)

- [11-14-1404](#), "11aa GCR-BA Performance in OBSS," Yuichi Morioka (Sony)
- [11-14-1416](#), "Observed protocol violations caused by DSC with roaming STAs," Chuck Lukaszewski (Aruba Networks)
- [11-14-1417](#), "HEW PPDU Transmission Discussion," Yongho Seok (NEWRACOM)
- [11-14-1426](#), "DSC and legacy coexistence," Gustav Wikstrom et al. (Ericsson)
- [11-14-1427](#), "DSC Performance," Gustav Wikstrom et al. (Ericsson)
- [11-14-1428](#), "Clear Channel Assessment for OFDMA PHY," K. C. Chen (NTU) and D. J. Deng (NCUE)
- [11-14-1431](#), "Issues on UL-OFDMA Transmission," Young Hoon Kwon (Newracom)
- [11-14-1433](#), "Protocol and signaling framework for OFDMA," Sigurd Schelstraete (Quantenna)
- [11-14-1435](#), "Considerations on OBSS Spatial Re-Use," Jianhan Liu (Mediatek Inc.)
- [11-14-1436](#), "Overhead Analysis for Simultaneous Downlink Transmissions," Pengfei Xia (interdigita)
- [11-14-1437](#), "Efficient Wider Bandwidth Operation in IEEE 802.11ax," Jinsoo Ahn (Yonsei Univ)
- [11-14-1439](#), "Preamble Considerations in Large Channel Delay Spread Scenarios," Daewon Lee (Newracom)
- [11-14-1442](#), "Considerations on DL OFDMA control mechanism," Woojin Ahn (Yonsei Univ.)
- [11-14-1443](#), "Adapting CCA and Receiver Sensitivity," Esa Tuomaala (Nokia)
- [11-14-1446](#), "Analysis of frequency and power requirements for UL-OFDM," Leif Wilhelmsson (Ericsson)
- [11-14-1448](#), "Considerations for Adaptive CCA," Reza Hedayat (Newracom)
- [11-14-1452](#), "Frequency selective scheduling in OFDMA," Leif Wilhelmsson (Ericsson)
- **Specification Framework**
 - [11-14-1429](#), "Proposed 802.11ax specification framework document," Minh Cheong (Newracom)
 - [11-14-1432](#), "Proposed 802.11ax specification framework - background," Minh Cheong (Newracom)
 - [11-14-1447](#), "Proposed Spec Framework Document for 11ax considering potential tech features," John Son (WILUS Institute), Young Doo Kim (SK Telecom)
 - [11-14-1453](#), "Spec Framework Proposal," Robert Stacey (Intel)

Goals for the January 2015 session

- Elect ad hoc chairs - 3 co-chairs/ad hoc group as agreed.
 - Continue to advance TG documents.
 - Technical Presentations.
-

Teleconferences

One teleconference is planned before the January 2015 session.

Thursday	December 4 th , 2014,	10:00 - 12:00 (ET)
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September 2014 — Athens, Greece

The TGax had nine sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1				TGax
AM2	TGax	TGax		
PM1		TGax	TGax	TGax

PM2	TGax	TGax		
PM3	TGax			

Main documents

The meeting agenda, minutes, and the closing report of TGax can be found here.

- [11-14-1033-05](#), TGax September 2014 Meeting Agenda
- [11-14-1460-00](#), TGax November 2014 Athens Meeting Minutes
- [11-14-1304-00](#), TGax November 2014 Closing Report

Achievements

1. The group elected two vice chairs and discussed about the TG structure.

Election of Vice Chairs took place during this meeting and two TG Vice Chairs are elected:

- Simone Merlin (Qualcomm)
- Ron Porat

The group started discussion on the Ad Hoc groups. Discussion will be continued in future meetings.

2. The group approved minutes from the July 2014 San Diego meeting.

- [11-14-0864-00](#), TGax July 2014 San Diego Meeting Minutes

3. TG Documents

The group approved updated documents.

- [11-14-0980-04](#), TGax Simulation Scenarios
- [11-14-0571-05](#), TGax Evaluation Methodology
- [11-14-0882-04](#), TGax Channel Models
- [11-14-1009-02](#), TGax Functional Requirements

4. Technical Presentations

54 submissions were submitted to the group and 52 of them were covered during the week.

◦ Functional Requirements

- [11-14-0636](#), "Discussion on Functional Requirements," David Xun Yang (Huawei Technologies)
- [11-14-0920](#), "Considerations of Functional Requirements Documents," David Xun Yang (Huawei Technologies)
- [11-14-1009](#), "Proposed 802.11ax Functional Requirements," Lei Wang (Marvell)
- [11-14-1164](#), "Meaningful 11ax Functional Requirements," Joe Kwak (InterDigital)
- [11-14-1167](#), "TGax Functional Requirement Discussion," Yonggang Fang (ZTE)
- [11-14-1170](#), "Functional Requirements Discussions on Coex with Legacy STAs," Masahito Mori (Sony)
- [11-14-1234](#), "Requirements Discussion," Joseph Levy (InterDigital)

◦ Simulation Scenarios and Calibration

- [11-14-0800](#), "Box 1 and Box 2 Calibration Results," Nihae Jindal (Broadcom)
- [11-14-1147](#), "MAC Simulator Calibration Results," Shoko Shinohara, Akira Kishida (NTT)
- [11-14-1175](#), "MAC Calibration results," Suhwook Kim (LG Electronics)
- [11-14-1177](#), "Discussion about Box5 Calibration," Jiyong Pang (Huawei Technologies)
- [11-14-1187](#), "The Effect of Preamble Error Model on MAC Simulator," Po-Kai Huang (Intel)
- [11-14-1191](#), "MAC calibration results," Zhou Lan (Huawei Technologies)
- [11-14-1192](#), "MAC calibration results comparison," Zhou Lan (Huawei Technologies)
- [11-14-1198](#), "Additional Test Cases for MAC calibration," Gwen Barriac (Qualcomm)
- [11-14-1217](#), "MAC Calibration Results for Test 1 and 2," Esa Tuomaala (Nokia)
- [11-14-1223](#), "Stadium Measurements," Brian Hart (Cisco Systems)
- [11-14-1226](#), "SLS Box 1&2 Calibration Results," Russell Huang (MediaTek)

- [11-14-1230](#), "MAC Calibration Result," Chinghwa Yu (MediaTek)
- **Evaluation Methodology**
 - [11-14-1161](#), "Parameters for Power Save Mechanisms," Eric Wong (Apple)
 - [11-14-1162](#), "Energy Efficiency Evaluation Methodology Follow Up," Eric Wong (Apple)
 - [11-14-1174](#), "PHY Abstraction with Time Varying Interference," Yakun Sun (Marvell)
 - [11-14-1176](#), "PHY abstraction tables for 11ax system level simulation," Jiayin Zhang (Huawei Technologies)
 - [11-14-1221](#), "Traffic Generator for OBSS Calibration Case," Chao-Chun Wang (MediaTek)
- **Channel Model**
 - [11-14-1214](#), "Impact of correlated shadowing in 802.11ax system evaluations," Leif Wilhelmsson (Ericsson AB)
 - [11-14-1222](#), "Doppler Effect Evaluation for 11ax," Jianhan Liu (MediaTek)
- **Technologies/Others**
 - [11-14-1106](#), "WLAN Frame Collision Information," Peng Shao (NEC Communication Systems)
 - [11-14-1148](#), "Consideration of asynchronous interference in OBSS environment," Koichi Ishihara (NTT)
 - [11-14-1168](#), "802.11 TGax PHY Frame Structure Discussion for Enabling New Contention Mechanism," Yonggang Fang (ZTE)
 - [11-14-1169](#), "DL-FDMA considerations," Katsuo Yunoki (KDDI R&D Labs.)
 - [11-14-1171](#), "DSC Simulation Results for Scenario 3," Masahiro Mori (Sony)
 - [11-14-1172](#), "Multicast Performance in OBSS," Yuichi Morioka (Sony)
 - [11-14-1178](#), "Inter-BSS interference in WLANs," Hyunduk Kang (ETRI)
 - [11-14-1179](#), "Considerations for Partial Band Interference between WLAN Systems," Gwangzeen Ko (ETRI)
 - [11-14-1180](#), "Discussions on Interference between TD-LTE & WLAN around 2.4GHz Band," Meng Yang (CATR)
 - [11-14-1181](#), "Measurements on A-MPDU performances under various channel conditions," John Sun (WILUS Institute)
 - [11-14-1186](#), "Comparisons of Simultaneous Downlink Transmissions," Pengfei Xia (InterDigital)
 - [11-14-1190](#), "Frame Exchange Control for Uplink Multi-user transmission," Kaying Lv (ZTE)
 - [11-14-1199](#), "Effect of CCA in residential scenario part 2," Gwen Barriac (Qualcomm)
 - [11-14-1207](#), "OBSS reuse mechanism which preserves fairness," Laurent Cariou (Orange)
 - [11-14-1208](#), "MAC considerations on 802.11ax OFDMA," Jinsoo Ahn (Yonsei Univ.)
 - [11-14-1209](#), "Multiple RF operation for 802.11ax OFDMA," Woojin Ahn (Yonsei Univ.)
 - [11-14-1210](#), "HEW PPDU Format for Supporting MIMO-OFDMA," Yongho Seok (NEWRACOM)
 - [11-14-1211](#), "ACK Procedure for OFDMA," Yongho Seok (NEWRACOM)
 - [11-14-1216](#), "Consideration on Coexistence between LTE-U and 802.11 WLAN," Jae Seung Lee (ETRI)
 - [11-14-1224](#), "Link-Aware CCA," Brian Hart (Cisco Systems)
 - [11-14-1225](#), "Considerations on CCA for OBSS Operation in 802.11ax," Luo Jun (Huawei Technologies)
 - [11-14-1227](#), "OFDMA Performance Analysis," Tianyu Wu (MediaTek)
 - [11-14-1228](#), "Issues on 256-FFT per 20MHz," Heejung Yu (NEWRACOM)
 - [11-14-1229](#), "Dynamic OFDM Symbol Duration," Alan Jauh (MediaTek)
 - [11-14-1232](#), "On MU Aggregation Mechanisms for 11ax," Reza Hedyat (NEWRACOM)
 - [11-14-1233](#), "Adaptive CCA for 11ax," Reza Hedyat (NEWRACOM)

Goals for the November 2014 session

- Continue to advance TG documents.
 - Technical Presentations.
-

Teleconferences

Three teleconferences are planned before the November 2014 session.



Thursday

October 9th, 2014

10:00 - 12:00 (ET)

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July 2014 — San Diego, CA

The TGax had 10 sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1	TGax		TGax	TGax
AM2		TGax		
PM1			TGax	TGax
PM2	TGax	TGax	TGax	
PM3		TGax		

Main documents

The meeting agenda, minutes, and the closing report of TGax can be found here.

- [11-14-0748-06](#), TGax July 2014 Meeting Agenda
- [11-14-0864-00](#), TGax July 2014 San Diego Meeting Minutes
- [11-14-0984-01](#), TGax July 2014 Closing Report

Achievements

1. The group discussed on the TG structure.

- The group will have two vice chairs to be election during the initial meeting slot of TGax in September 2014.
 - Chair has sent out the call for nominations to the reflector.
- The group will have some ad hoc groups in the future, however, the discussion on the ad hoc structure was deferred.

2. The group approved minutes from the May 2014 Waikoloa meeting and Teleconference on July 2nd, 2014.

- [11-14-0655-03](#), May 2014 Waikoloa Meeting Minutes
- [11-14-0788-02](#), Minutes from the teleconference on July 2nd, 2014

3. TG Documents

The group discussed and approved following documents as current TG documents.

- The group approved new version of the Simulation Scenarios Document ([11-14-0980-01](#)).
- The group approved new version of the Evaluation Methodology Document ([11-14-0571-03](#)).
- The group approved the initial version of the TGax Channel Model document ([11-14-0882r3](#)).
- The group adopted the initial version of the TGax Selection Procedure ([11-14-0938r4](#)).
- The group had discussion on the Functional Requirements document.

4. Technical Presentations

More than 40 submissions were covered during the week.

◦ Simulation Scenarios and Calibration

- [11-14-0799](#), "Modifications to Simulation Scenarios and Calibration Process," Nihar Jindal (Broadcom)
- [11-14-0800](#), "Box 1 and Box 2 Calibration Results," Nihar Jindal (Broadcom)
- [11-14-0803](#), "Packet Length for Box 0 Calibration," Wookbong Lee (LG Electronics)
- [11-14-0850](#), "Clarification for MAC Calibration," Gwen Barriac (Qualcomm)

- [11-14-0851](#), "Proposed Rate Control for MAC Simulator," Gwen Barriac (Qualcomm)
- [11-14-0859](#), "Proposing a Stadium Scenario," Hakan Persson (Ericsson)
- [11-14-0860](#), "Text proposal of a Stadium scenario to ax," Hakan Persson (Ericsson)
- [11-14-0869](#), "MAC calibration results," Zhou Lan (Huawei)
- [11-14-0871](#), "Further Calibration Results towards Integrated System Level Simulation," Jiyong Pang (Huawei)
- [11-14-0892](#), "MAC Calibration Text to Simulation Scenarios," Jarkko Knecht (Nokia)
- [11-14-0894](#), "Calibration of System Level Simulators," Sayantan Choudhury (Nokia)
- [11-14-0895](#), "Calibration of MAC simulator with OBSS Network Scenario," Chao-CHun Wang (MediaTek)
- **Evaluation Methodology**
 - [11-14-0571](#), "Evaluation Methodologies," Ron Porat (Broadcom)
 - [11-14-0810](#), "RBIR-based PHY Abstraction with Channel Estimation Error," Yukun Sun (Marvell)
 - [11-14-0811](#), "Overview on RBIR-based PHY Abstraction," Yukun Sun (Marvell)
 - [11-14-0827](#), "Energy Efficiency Evaluation Methodology," Eric Wong (Apple)
 - [11-14-0865](#), "ACI and AACI for 802.11ax System Simulations," Yu Cai (Huawei)
 - [11-14-0866](#), "Traffic modeling and system capacity performance measure," Johan Soder (Ericsson)
 - [11-14-0873](#), "PHY Abstraction Table for 11ax System Level Simulations," Jiayin Zhang (Huawei)
 - [11-14-0874](#), "Unified Traffic Model on Enterprise Scenario," Phillip Barber (Huawei)
 - [11-14-0875](#), "VoIP Traffic Model Content for 11ax TG Simulation Scenarios & Evaluation Methodology," Phillip Barber (Huawei)
- **Channel Models**
 - [11-14-0882](#), "IEEE 802.11ax Channel Model Document," Jianhan Liu (Mediatek)
 - [11-14-0904](#), "In-Cabin WiFi Channel Channel: Preliminary Ray Tracing Simulations," Fan Bai (General Motors)
- **Functional requirements**
 - [11-14-0567](#), "Proposed 802.11ax Functional Requirements," Lei Wang (Marvell)
 - [11-14-0818](#), "Synchronization Requirements," Yonggang Fang (ZTE)
 - [11-14-0821](#), "Coexistence Requirements of 802.11 WLAN and LTE in Unlicensed Spectrum," Alireza Babaei (CableLabs)
 - [11-14-0835](#), "Functional Requirements Discussion," Joe Kwak (InterDigital)
- **Technologies/Others**
 - [11-14-0779](#), "Dynamic Sensitivity Control Practical Usage," Graham Smith (DSP Group)
 - [11-14-0801](#), "Envisioning 11ax PHY Structure - Part II," Dongguk Lim (LG Electronics)
 - [11-14-0802](#), "Consideration on UL MU transmission," Jinyoung Chun (LG Electronics)
 - [11-14-0804](#), "Envisioning 11ax PHY Structure - Part I," Jinsoo Choi (LG Electronics)
 - [11-14-0832](#), "Performance Evaluation of OBSS Densification," Po-Kai Huang (Intel)
 - [11-14-0833](#), "Residential Scenario Sensitivity and Transmit Power Control Simulation Results," Ron Murias (InterDigital)
 - [11-14-0838](#), "Discussion on dual-link STR in IEEE 802.11ax," Jinsoo Ahn (Yonsei Univ)
 - [11-14-0839](#), "Discussion on OFDMA in IEEE 802.11ax," Jinsoo Ahn (Yonsei Univ)
 - [11-14-0846](#), "Changing CCA in the Residential Environment," Gwen Barriac (Qualcomm)
 - [11-14-0847](#), "Further Considerations on Enhanced CCA for 11ax," John Son (WILUS Institute)
 - [11-14-0854](#), "DSC and Legacy Coexistence," Yuichi Morioka (SONY)
 - [11-15-0855](#), "Techniques for Short Downlink Frames," Brian Hart (Cisco Systems)
 - [11-15-0856](#), "Evaluating Dynamic CCA/Receiver Sensitivity Algorithms," Brian Hart (Cisco Systems)
 - [11-14-0858](#), "Analysis on Multiplexing Schemes exploiting frequency selectivity," Kaushik Josiam (Samsung)
 - [11-14-0861](#), "Impact of CCA adaptation on spatial reuse in dense residential scenario," Sayantan Choudhury (Nokia)
 - [11-14-0868](#), "UL & DL DSC and TPC MAC simulations," Johan Soder (Ericsson)
 - [11-14-0872](#), "A Protocol Framework for Dynamic CCA," Sean Coffey (Realtek)
 - [11-14-0880](#), "Increased Network Throughput with Channel Width Related CCA and Rules," James Wang (Mediatek)
 - [11-14-0889](#), "Performance Gains from CCA Optimization," Nihar Jindal (Broadcom)

5. Timeline

No change was made to the tGax initial timeline that was approved during the May 2014 Waikoloa session.

Current Timeline	
May 2014	Start of TG
November 2014	Start to work on the specification framework
July 2016	Draft 1.0 to be ready
March 2017	Draft 2.0 to be ready
1H 2019	Publication of IEEE 802.11ax amendment

Goals for the September 2014 session

- TG vice-chairs election.
- Continue to advance TG documents.
- Technical Presentations.

Teleconferences

Three teleconferences are planned before the September 2014 session.

Thursday	August 14 th , 2014	10:00 - 12:00 (ET)
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Chair had sent out call for submissions on the TGax reflector.

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May 2014 — Waikoloa, HI

The TGax had 10 sessions during the week.

Four out of ten sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1			TGax	TGax
AM2	TGax	TGax		
PM1				Tgax
PM2	TGax	TGax		
PM3	TGax	TGax		

Main documents

The meeting agenda, minutes, and the closing report of TGax can be found here.

- [11-14-0478-05](#), TGax May 2014 Meeting Agenda
- [11-14-0655-01](#), TGax May 2014 Waikoloa Meeting Minutes
- [11-14-0702-00](#), TGax May 2014 Closing Report

Achievements

1. **The group elected the chairperson and the secretary.**

- **Chairperson: Osama Aboul-Magd (Huawei Technologies)**
- **Secretary: Yasuhiko Inoue (NTT)**

Other officer positions and TG structure will be discussed in the July 2014 session.

2. **The group approved minutes from the March 2014 Beijing meeting and Teleconference on April 17th, 2014.**

- [11-14-0380-01](#), HEW SG March 2014 Beijing Meeting Minutes
- [11-14-0530-00](#), TGax teleconference minutes - 2014.04.17

3. **TG Documents**

- The group approved initial version of the Simulation Scenarios ([11-14-0621-04](#)) and Evaluation Methodology ([11-14-0571-02](#)) documents.
- The group started the discussion related to Functional Requirements document. Expectation is to approve the initial revision of the document in July.
- Discussion related to Channel Model document is expected to start in July.

4. **Technical Presentations**

40 submissions were covered during the week.

- [11-14-0527](#), "PHY Abstraction for TGax System Level Simulations", Pengfei Xia (InterDigital)
- [11-14-0546](#), "IEEE 802.11ax High Efficiency WLAN Packet measurements around Boulder Colorado", Jim Lansford (CSR)
- [11-14-0567](#), "Proposed 802.11ax Functional Requirements", Lei Wang (Marvell)
- [11-14-0571](#), "11ax Evaluation Methodologies", Ron Porat (Broadcom)
- [11-14-0577](#), "Path Loss Model for Scenario 1," Nihar Jindal (Broadcom)
- [11-14-0578](#), "Residential Scenario CCA/TPC Simulation Discussion," Frank La Sita (InterDigital)
- [11-14-0581](#), "Further Discussions on PHY Abstraction," Yakun Sun (Marvell)
- [11-14-0582](#), "Calibrating MAC Simulator Through Function Test," Jinjing Jiang (Marvell)
- [11-14-0583](#), "Further Discussions on Instantaneous SINR Calibration for System Simulation," Yakun Sun (Marvell)
- [11-14-0584](#), "System Level Simulations on Beamforming and Link Adaptation," Yan Zhang (Marvell)
- [11-14-0585](#), "PHY Abstractions for and IEEE 11ax PHY System Simulation and Integrated System Level Simulation," Jianhan Liu (MediaTek)
- [11-14-0586](#), "Automotive Considerations for the Simulation Scenarios," Igal Kotzer (General Motors)
- [11-14-0594](#), "Insert Virtual Desktop Infrastructure (VDI) Traffic Model Content for HEW Simulation Scenarios," Yingpei Lin (Huawei)
- [11-14-0595](#), "Edits on Some Traffic Content for HEW SG Simulation Scenarios," Yingpei Lin (Huawei)
- [11-14-0598](#), "Uplink multi-user MAC protocol for 11ax," Tran Thi Thao Nguyen (Kyushu Inst. of Tech.)
- [11-14-0600](#), "Proposed Calibration For MAC simulator," Gwen Barriac (Qualcomm)
- [11-14-0604](#), "Modeling and Evaluating Variable Bit rate Video Streaming for 802.11ax," Chao-Chun Wang (MediaTek)
- [11-14-0612](#), "Calibration Procedures towards Integrated System Level Simulation," Jiayin Zhang (Huawei)
- [11-14-0613](#), "Discussions on adaptive frame length in MAC based on block ACK," Ningbo Zhang (BUPT)
- [11-14-0614](#), "Joint Coding and Modulation Diversity with LRA MMSE VP by QR precoding MIMO," Ningbo Zhang (BUPT)
- [11-14-0616](#), "CSMA/CA Enhancement Suggestion," Yonggang Fang (ZTE)
- [11-14-0617](#), "Discussion on timeline for 802.11ax," Laurent Cariou (Orange)
- [11-14-0620](#), "Link Adaptation for PHY SLS calibration," Jinyoung Chun (LG Electronics)
- [11-14-0621](#), "TGax Simulation Scenarios," Simone Merlin (Qualcomm)
- [11-14-0624](#), "Investigation on 1024 QAM feasibility in 11ax," Eunsung Park (LG Electronics)
- [11-14-0625](#), "Multi-channel operation in Simulation scenarios," Suhwook Kim (LG Electronics)
- [11-14-0626](#), "IEEE 802.11ax Functional Requirements," SangHyun Chang (Samsung)
- [11-14-0627](#), "Outdoor Channel Models for System Level Simulations," Kaushik Josiam (Samsung)
- [11-14-0628](#), "Measurements on CCA Thresholds in OBSS Environment," John Son (WILUS Institute), Young Doo Kim (SK Telecom)
- [11-14-0634](#), "Consideration on MAC system calibration," Zhou Lan (Huawei)
- [11-14-0635](#), "Dynamic Sensitivity Control Implementation," Graham Smith (DSP Group)

- [11-14-0636](#), "Consideration on functional requirements," Zhou Lan (Huawei)
- [11-14-0637](#), "Spatial Reuse and Coexistence with Legacy Devices," James Wang (MediaTek)
- [11-14-0647](#), "PHY abstraction method comparison," Tianyu Wu (MediaTek)
- [11-14-0648](#), "Performance Observation of a Dense Campus Network," Chinghwa Yu (MediaTek)
- [11-14-0649](#), "802.11ax Timeline Scenarios," Rolf de Vegt (Qualcomm)
- [11-14-0656](#), "How to Describe 802.11ax Functional Requirements," Minh Cheong
- [11-14-0660](#), "802.11ax Timeline," Minh Cheong (NEWRACOM)
- [11-14-0677](#), "Comparison of Calibration Methodology for MAC Simulation," Chinghwa Yu (MediaTek)
- [11-14-0682](#), "In Situ Spectrum Reuse Measurements in Indoor 20,000 Seat Arena," Chuck Lukaszewski (Aruba Networks)

5. Timeline

The group approved initial timeline.

Current Timeline	
May 2014	Start of TG
November 2014	Start to work on the specification framework
July 2016	Draft 1.0 to be ready
March 2017	Draft 2.0 to be ready
1H 2019	Publication of IEEE 802.11ax amendment

Goals for the July 2014 session

- Continue to advance simulation scenarios (11-14/0621) and Evaluation Methodologies (11-14/0571) documents.
- Approve an initial Functional Requirements document.
- Approve an initial Channel Model document.
- Discuss and approve TG structure and process.
- Technical Presentations.

Teleconferences

Three teleconferences are planned before the July 2014 meeting.

Wednesday	June 4 th , 2014	10:00 - 12:00 (ET)
Wednesday	June 18 th , 2014	20:00 - 22:00 (ET)
Wednesday	July 2 nd , 2014	10:00 - 12:00 (ET)

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High Efficiency WLAN (HEW) Study Group

March 2014 — Beijing, China

The HEW SG had 7 sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1			HEW	HEW
AM2		HEW		
PM1				HEW
PM2	HEW	HEW		
PM3		HEW		

Main documents

The meeting agenda, minutes, and the closing report of HEW SG can be found here.

- [11-14-0219-04](#), HEW SG Maarch 2014 Meeting Agenda
- [11-14-0380-00](#), HEW SG March 2014 Beijing Meeting Minutes
- [11-14-0457-00](#), HEW SG March 2014 Closing Report

Achievements

1. **The group approved minutes from the January 2014 Los Angeles meeting and teleconferences on February 6th, 2014 and February 13th, 2014.**
 - [11-14-0199-00](#), January 2014 Los Angeles Meeting Minutes
 - [11-14-0229-02](#), Minutes from the teleconference on February 6th, 2014
 - [11-14-0242-00](#), Minutes from the teleconference on February 13th, 2014
2. **Addressed comments related to the PAR and CSD received from individuals and other IEEE 802 WGs.**
Resolutions of comments are contained in the following document:
 - <https://mentor.ieee.org/802.11/dcn/14/11-14-0424-00-0hew-hew-sg-par-and-csd-comments-and-resolutions.pptx>
3. **Updated the PAR and the CSD documents based on received comments:**
 - <https://mentor.ieee.org/802.11/dcn/14/11-14-0165-01-0hew-802-11-hew-sg-proposed-par.docx>
 - <https://mentor.ieee.org/802.11/dcn/14/11-14-0169-01-0hew-ieee-802-11-hew-sg-proposed-csd.docx>
4. **The group passed motions to approve revised PAR and CSD documents, and SG extension.**

Revised PAR (11-14/0165r1): Y/N/A = 94/0/1, Motion passes.

Revised CSD (11-14/0169r1): Y/N/A = 97/0/1, Motion passes.

SG extension: Y/N/A = 105/0/0, Motion passes.

HEW SG has completed its work and the IEEE standard board approved 802.11ax project.

5. **The group received more than 30 submissions in the categories of simulation scenarios, evaluation methodologies, channel models, functional requirements, technologies and selection procedure.**

Following submissions have been presented and discussed during the week.

- [11-13-1359](#), "HEW-Evaluation-Methodology" Ron Porat (Broadcom)
- [11-14-0112](#), "Wi-Fi interference measurements in Korea - part II", Minh Cheong (NEWCOM)
- [11-14-0113](#), "Modeling of additional channel loss in dense WLAN environments", Minh Cheong (NEWCOM)
- [11-14-0294](#), "DSC Channel Selection and Legacy Sharing" Graham Smith (DSP Group)
- [11-14-0301](#), "Multicast Considerations for HEW", Eisuke Sakai (Sony Corporation)
- [11-14-0306](#), "Discussions on HEW Functional Requirements", Lei Wang (Marvell)
- [11-14-0307](#), "PHY Calibration Results", Nihar Jindal (Broadcom)

- [11-14-0328](#), "Dense Apartment Complex Throughput Calculations", Graham Smith (DSP Group)
- [11-14-0329](#), "Channel Models for different links in Simulations", Kaushik Josiam (Samsung)
- [11-14-0330](#), "HEW PHY Abstraction", Sameer Vermani (Qualcomm)
- [11-14-0335](#), "Instantaneous SINR Calibration for System Simulation", Yakun Sun (Marvell)
- [11-14-0336](#), "Calibration of Long-Term SINR for System Simulator" Yakun Sun (Marvell)
- [11-14-0339](#), "A simplified STR Mechanism", Raja Banerjea (CSR)
- [11-14-0340](#), "A simplified STR Mechanism - MAC", Raja Banerjea (CSR)
- [11-14-0342](#), "Short Packet Optimizations", Naveen Kakani (CSR, Inc)
- [11-14-0345](#), "Joint Coding and Modulation Diversity with RBD pre-coding for next generation WLAN", Zhanji Wu (BUPT)
- [11-14-0350](#), "Suggestion on Evaluation Methodology", Jinyoung Chun (LG Electronics)
- [11-14-0352](#), "Discussion on power save mode for real time traffic", Giwon Park (LG Electronics)
- [11-14-0353](#), "Suggestion on PHY Abstraction for Evaluation Methodology", Dongguk Lim (LG Electronics)
- [11-14-0355](#), "Simulation Scenario 1 Revised", Simone Merlin (Qualcomm)
- [11-14-0356](#), "Calibration of System Level Simulators", Jarkko Kneckt (Nokia)
- [11-14-0357](#), "Utilizing Unused Resources for Simultaneous Transmissions", Jarkko Kneckt (Nokia)
- [11-14-0365](#), "Extended Intra-Vehicle Channel Model", Igal Kotzer (General Motors)
- [11-14-0372](#), "System level simulations on increased spatial reuse", Liwen Chu (Marvell)
- [11-14-0373](#), "Energy Efficiency in HEW", Pingping Xu, Wei Wang (Southeast University)
- [11-14-0381](#), "Stadium scenario for HEW", Johan Soder, Filip Mestanov (Ericsson AB)
- [11-14-0383](#), "Considerations on evaluation methodology for candidate HEW PHY&MAC techniques", Le Liu (Huawei)
- [11-14-0385](#), "Simulation Methodology and Calibration", Gwen Barriac (Qualcomm)
- [11-14-0386](#), "Discussions on MCS selection" , Tianyu Wu (MediaTek)
- [11-14-0392](#), "Traffic Separation Scheme for Optimizing WLANs using PHY and MAC options", Takayuki Nishio (Kyoto University)
- [11-14-0393](#), "Possible Indoor Channel Models for HEW System Simulations", Leif Wilhelmsson (Ericsson AB)
- [11-14-0419](#), "802.11ax Spec Development Process Proposal", Rolf de Vegt (Qualcomm)

Goals for the May 2014 session

- Meet as a new TG and will have officer elections.
- Continue the work on simulation scenarios, evaluation methodologies, channel models, and function requirements.

Teleconferences

Three teleconferences are planned before the May 2014 meeting.

Thursday	April 17 th , 2014	10:00 - 12:00 (ET)
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Details to be announced.

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January 2014 — Los Angeles, CA

The HEW SG had 9 sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
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AM1				HEW
AM2	HEW	HEW		
PM1				HEW
PM2	HEW	HEW	HEW	
PM3	HEW	HEW		

Main documents

- [11-13-1506-05](#), HEW SG January 2014 Meeting Agenda
- [11-14-0199-00](#), HEW SG January 2014 Los Angeles Meeting Minutes
- [11-14-0187-00](#), HEW SG January 2014 Closing Report

Achievements

1. **The group approved minutes from the November 2013 Dallas meeting and teleconferences on December 4th, 2013, December 18th, 2013 and January 8th, 2014.**
 - [11-13-1465-01](#), November 2013 Dallas Meeting Minutes
 - [11-13-1495-00](#), Minutes from the teleconference on December 4th, 2013
 - [11-13-1532-01](#), Minutes from the teleconference on December 18th, 2013
 - [11-14-0024-01](#), Minutes from the teleconference on January 8th, 2014
2. **The group resolved open issues related to the PAR and CSD.**
3. **The group received 28 submissions that were categorized into (1) PAR and 5 Criteria related submissions, and (2) Best Effort submissions. Best Effort submissions basically related to simulation scenario and evaluation methodology.**
4. **The group passed motions to approve PAR and CSD.**
 - **PAR and 5 Criteria related submissions (high priority)**
 - [11-13-1410](#), "802.11 HEW Draft PAR and 5C", Osama Aboul-Magd and All
 - [11-13-1489](#), "Airport Capacity Analysis", Graham Smith (DSP Group)
 - [11-14-0026](#), "thoughts on hew par", Yong Liu (Apple)
 - [11-14-0045](#), "E-Education Analysis", Graham Smith (DSP Group)
 - [11-14-0058](#), "Pico Cell Use Case Analysis ", Graham Smith (DSP Group)
 - [11-14-0061](#), "Some findings from real world measurement", Katsuo Yunoki (KDDI Labs)
 - [11-14-0065](#), "Comments on Draft HEW PAR", Bill Carney (SONY)
 - [11-14-0101](#), "Comments on 802.11 HEW Draft PAR & 5C", Rakesh Taori (Samsung Electronics)
 - [11-14-0106](#), "Discussion on HEW PAR", Kiseon Ryu (LG Electronics)
 - [11-14-0119](#), "Suggested PAR Changes", James Yee (MediaTek)
 - [11-14-0163](#), "Raising the PAR", Mat Fischer (Broadcom)
 - **Best Effort submissions**
 - [11-14-0043](#), "PHY abstraction in system level simulation for HEW study", Fei Tong (Samsung)
 - [11-14-0051](#), "Wireless Office with Interference", David Xun Yang (Huawei)
 - [11-14-0053](#), "Further Considerations on Calibration of System Level Simulation", Jiayin Zhang (Huawei)
 - [11-14-0056](#), "Traffic Model on Virtual Desktop Infrastructure", Yingpei Lin (Huawei)
 - [11-14-0059](#), "Integrated System Level Simulation", Jun Luo (Huawei)
 - [11-14-0063](#), "Design Challenges for 802.11 HEW Radios", Yu Cai (Huawei)
 - [11-14-0070](#), "Joint MAC/PHY Evaluation Methodology", Kaushik Josiam (Samsung)
 - [11-14-0082](#), "Improved Spatial Reuse Feasibility - Part I", Ron Porat (Broadcom)
 - [11-14-0083](#), "Improved Spatial Reuse Feasibility - Part II", Ron Porat (Broadcom)
 - [11-14-0086](#), "Outdoor AP Measurement in Tokyo", Tsugu Aoki (Toshiba)
 - [11-14-0088](#), "Intra-Vehicular Channel Model", Igal Kotzer (General Motors)

- [11-14-0095](#), "OFDM-IDMA Uplink Communication", Leonardo Lanante (Kyushu Inst. Of Tech)
- [11-14-0107](#), "HEW Evaluation Metrics", Yonggang Fang (ZTETX)
- [11-14-0116](#), "Long-Term SINR Calibration for System Level Simulation", Yakun Sun (Marvell)
- [11-14-0117](#), "PHY Abstraction for HEW System Level Simulation", Yakun Sun (Marvell)
- [11-14-0118](#), "Consideration on System Level Simulation", Jinsoo Chio (LG Electronics)

5. **The group passed motions to approve PAR and CSD**

- [11-14-165-00](#), IEEE 802.11 HEW SG Proposed PAR
- [11-14-169-00](#), IEEE 802.11 HEW SG Proposed CSD

Goals for the March 2014 session

- Resolve comments expected from EC members and other IEEE 802 WGs
- Continue with presentations relevant to the SG topics.
 - Simulation scenarios
 - Evaluation Methodologies
 - Channel Models
 - Technology
 - etc.

Teleconferences

The group agreed to have four teleconferences before the March 2014 session.

Thursday	February 6 th , 2014	20:00 - 22:00 (ET)
Thursday	February 13 th , 2014	10:00 - 12:00 (ET)
Thursday	February 20 th , 2014	10:00 - 12:00 (ET)
Thursday	February 27 th , 2014	20:00 - 22:00 (ET)

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November 2013 — Dallas, TX

The HEW SG had 10 sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1			HEW	HEW
AM2		HEW		
PM1		HEW	HEW	HEW
PM2	HEW	HEW	HEW	HEW
PM3				

Main documents

- [11-13-1263-05](#), HEW SG November 2013 Meeting Agenda
- [11-13-1465-01](#), HEW SG November 2013 Dallas Meeting Minutes
- [11-13-1476-01](#), HEW SG November 2013 Closing Report

Achievements

1. The group approved minutes from the September 2013 Nanjing meeting and teleconferences on October 3rd and October 30th, 2013.

- [11-13-1117-01](#), September 2013 Nanjing Meeting Minutes
- [11-13-1275-01](#), Minutes from the teleconference on October 3rd, 2013
- [11-13-1303-00](#), Minutes from the teleconference on October 30th, 2013

2. The group received more than 40 submissions that were categorized into three categories, i.e., (1) Channel Mode/Simulation Scenarios and Evaluation Methodologies, (2) MAC/PHY technologies and (3) PAR proposals.

Following submissions were presented during the week.

- **Channel Models, Simulation Scenarios and Evaluation Methodologies**
 - [11-13-1001](#), "HEW SG Simulation Scenarios", Simone Merlin (Qualcomm)
 - [11-13-1305](#), "Simplification on HEW traffic models", Bill Carney (Sony)
 - [11-13-1334](#), [11-13-1335](#), "Video Traffic Modeling", Guiqing Li (Intel)
 - [11-13-1359](#), "HEW Evaluation Methodology", Ron Porat (Broadcom)
 - [11-13-1370](#), "LTE OOB Interference to 2.4 GHz Band", Yonggang Fang (ZTE TX)
 - [11-13-1376](#), "Discussions on Penetration Loss", Jianhan Liu (MediaTek)
 - [11-13-1380](#), "Outdoor Channel Model Simulation Follow-up", Hongyuan Zhang (Marvell)
 - [11-13-1383](#), "System Level Simulation Parameters", Wookbong Lee (LG Electronics)
 - [11-13-1387](#), "HEW channel modeling for system level simulation", Yan Zhang (Marvell)
 - [11-13-1390](#), "PHY Abstraction for HEW System Level Simulations", Yakun Sun (Marvell)
 - [11-13-1391](#), "About SINR conversion for PHY Abstraction", Yakun Sun (Marvell)
 - [11-13-1392](#), "Methodology of Calibrating System Level Simulation Results", Yakun Sun (Marvell)
 - [11-13-1401](#), "System Level Assessments for Outdoor HEW Deployments", Kaushik Josiam (Samsung)
 - [11-13-1406](#), "Traffic Modeling for HEW Simulations", Huai-Rong Shao (Samsung)
 - [11-13-1407](#), "Simulation based study of QoE", Chao-Chun Wang (MediaTek)
 - [11-13-1412](#), "How to use simulation scenarios in HEW", Minh Cheong (ETIR)
 - [11-13-1419](#), "Modifications to ITU Channel Model to Support 160MHz bandwidth of operation", Shahnaz Azizi (Intel)
 - [11-13-1420](#), "HEW Considerations for the Vehicular Environment", Igal Kotzer (General Motors)
 - [11-13-1438](#), "Traffic Observation and Study on Virtual Desktop Infrastructure", Phillip Barber (Huawei Technologies)
 - [11-13-1456](#), "Considerations on WFA feedback", Simone Merlin (Qualcomm)
- **MAC/PHY Technologies**
 - [11-13-1325](#), "IEEE 802.11ai overview", Hiroshi Mano (ATRD), chair of TGai
 - [11-13-1349](#), "Access Control Enhancement", Katsuo Yunoki (KDDI)
 - [11-13-1375](#), "Summary and Discussions of Proposals on Potential PHY Technologies in HEW", Jianhan Liu (MediaTek)
 - [11-13-1377](#), "DL efficiency enhancement in high density network", Kiseon Ryu (LG Electronics)
 - [11-13-1382](#), "Discussion on OFDMA in HEW", Jinsoo Choi (LG Electronics)
 - [11-13-1386](#), "Improving WLAN Efficiency and QoE - A Top Down Approach", Veli-Pekka Kentonen (7 Signals)
 - [11-13-1388](#), "UL MU-MIMO transmission", Jinyoung Chun (LG)
 - [11-13-1395](#), "Simultaneous Transmission Technologies for HEW", Koichi Ishihara (NTT)
 - [11-13-1409](#), "Dual Wi-Fi: Dual Channel Wi-Fi for Congested WLANs with Asymmetric Traffic Loads", Adriana Flores (Rice University)
 - [11-13-1421](#), "STR Radios and STR Media Access", Phillip Levis (Stanford University)
 - [11-13-1440](#), "Argos | Practical Massive-MIMO", Clayton Shepard (Rice University)

- **PAR proposals**
 - [11-13-1331](#), "Proposed direction and priorities for HEW", Guido R. Hiertz (Ericsson)
 - [11-13-1333](#), "Power Efficiency PAR Requirements", Chris Hansen (Covariant)
 - [11-13-1361](#), "Discussion to derive HEW Functional Requirements", Yasunao Misawa (KDDI)
 - [11-13-1366](#), "Some propositions to progress towards the PAR definition", Laurent Cariou (Orange)
 - [11-13-1389](#), "Discussion on HEW PAR", HanGyu Cho (LG Electronics)
 - [11-13-1397](#), "Renewing 2.4 GHz", Brian Hart (Cisco Systems)
 - [11-13-1398](#), "Requirements for HEW", Akira Yamada (NTT DOCOMO)
 - [11-13-1404](#), "Some Thoughts on PAR", and [11-13-1405](#), "HEW PAR", Eldad Perahia (Intel)
 - [11-13-1450](#), "Summary of PAR Discussions", Osama Aboul-Magd (HEW SG chair)
 - [11-13-1470](#) and [11-13-1471](#), "802.11 HEW proposed basis for PAR discussion", Laurent Cariou (Orange)
- 3. **Discussed the WFA feedback on prioritization of the usage cases and approved a liaison letter back to WFA.**
 - Feedback from the Wi-Fi Alliance:
 - [11-13-1443-00](#), Liaison from Wi-Fi Alliance - HEW Use Cases
 - Approved a liaison document to the Wi-Fi Alliance:
 - [11-13-1446-00](#), IEEE 802.11 Liaison to WFA on Prioritization of High Efficiency WLAN (HEW) Usage Scenarios
- 4. **Started the discussion on the PAR.**
- 5. **The group passed a motion to extend the study group by 136/0/2.**

Goals for the January 2014 session

- Progress the work on the PAR and 5C.

Teleconferences

Three teleconferences are planned before the March 2016 meeting.

Wednesday	December 4 th , 2013	10:00 - 12:00 (ET)
Wednesday	December 18 th , 2013	20:00 - 22:00 (ET)
Wednesday	January 8 th , 2014	10:00 - 12:00 (ET)

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September 2013 — Nanjing, China

The HEW SG had 9 sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1				HEW
AM2		HEW		
PM1			HEW	HEW
PM2	HEW	HEW	HEW	
PM3	HEW	HEW		

Main documents

- [11-13-0951-07](#), HEW SG September 2013 Meeting Agenda
- [11-13-1117-01](#), HEW SG September 2013 Nanjing Meeting Minutes
- [11-13-1231-01](#), HEW SG September 2013 Closing Report

Achievements

1. **The group approved minutes from the Geneva meeting and teleconference on August 28th, 2013.**
 - [11-13-0861-01](#), Minutes from face-to-face meeting in Geneva, July 2013
 - [11-13-1003-00](#), Minutes from the teleconference on August 28th, 2013
2. **50 submissions in the following categories were received and presented during the week.**
 - **Channel Models**
 - [11-13-0996](#), "Outdoor Channel Model Candidates for HEW", Kaushik Josiam (Samsung)
 - [11-13-1113](#), "Channel Modeling for Dense Wi-Fi Environments", Minh Cheong (ETRI)
 - [11-13-1125](#), "HEW Outdoor Channel Model Discussions", Hongyuan Zhang (Marvell)
 - [11-13-1135](#), "Summary of HEW Channel Models", Jianhan Liu (MediaTek)
 - [11-13-1146](#), "Update on HEW Channel Model", Shahrnaz Azizi (Intel Corp)
 - **Simulation Scenarios/Simulation Methodologies**
 - [11-13-1000](#), "Simulation Scenarios", Simone Merlin (Qualcomm)
 - [11-13-1001](#), "Simulation Scenarios Document Template", Simone Merlin (Qualcomm)
 - [11-13-1079](#), "Outdoor Stadium Simulation Details Discussion", Joseph Levy (InterDigital)
 - [11-13-1080](#), "Markov Modeling of the Channel for HEW System Level Simulations", Joseph Levy (InterDigital)
 - [11-13-1081](#), "HEW Simulation Methodology", Sayantan Choudhury (Nokia)
 - [11-13-1083](#), "HEW SG Unified Simulation Scenarios", David Xun Yang (Huawei)
 - [11-13-1114](#), "Simulation Scenario for unplanned Wi-Fi Network", Jae Seung Lee (ETRI)
 - [11-13-1123](#), "Capacity Simulation of High Density Indoor WLAN Systems", Filip Mestanov (Ericsson AB)
 - [11-13-1133](#), "Virtual Desktop Infrastructure (VDI)", Yingpei Lin (Huawei Technologies)
 - [11-13-1153](#), "Simulation Scenario Proposal", Laurent Cariou (Orange)
 - [11-13-1159](#), "Video Performance Requirements and Simulation Parameters", Guoqing Li (Intel)
 - [11-13-1162](#), "Video Application Categories and Characteristics", Guoqing Li (Intel)
 - [11-13-1176](#), "Some Simulation Scenarios for HEW", Reza Hedayat (Cisco)
 - **Evaluation Methodology**
 - [11-13-1051](#), "Evaluation Methodology", Ron Porat (Broadcom)
 - [11-13-1054](#), "HEW Evaluation Metrics Suggestions", Yonggang Fang (ZTETX)
 - [11-13-1059](#), "PHY Abstraction for HEW Evaluation Methodology", Dongguk Lim (LG Electronics)
 - [11-13-1131](#), "PHY Abstraction for HEW System Level Simulation", Jiayin Zhang (Huawei Technologies)
 - [11-13-1137](#), "The Definition of Performance Metrics for HEW", Hui-Rong Shao (Samsung)
 - [11-13-1144](#), "Simplified Traffic Model Based on Aggregated Network Statistics", William Carney (Sony)
 - [11-13-1158](#), "Video Traffic and Applications for HEW", William Carney (Sony)
 - **Functional Requirements**
 - [11-13-1097](#), "Functional Requirements for HEW PAR", Minh Cheong (ETRI)
 - [11-13-1116](#), "Discussion on HEW Functional Requirements", Jinsoo Choi (LG Electronics)
 - **MAC/PHY Technologies**
 - [11-13-1046](#), "Discussion for Massive MIMO for HEW", Zhigang Wen (BUPT)
 - [11-13-1056](#), "Enhancement on resource utilization in OBSS environment", Giwon Park (LG Electronics)
 - [11-13-1058](#), "Efficient wider bandwidth operation", Kiseon Ryu (LG Electronics)

- [11-13-1061](#), "Multicast Transmission for HEW", Jeongki Kim (LG electronics)
- [11-13-1073](#), "Access Control Enhancement", Katsuo Yunoki (KDDI Labs)
- [11-13-1074](#), "Occupied air time calculation for doc.1073r0", Katsuo Yunoki (KDDI R&D Laboratories)
- [11-13-1077](#), "EDCA Enhancements for HEW", Hui Zhao (BUPT)
- [11-13-1089](#), "D2D Technology for HEW", Xiang Gao (BUPT)
- [11-13-1090](#), "Non-linear pre-coding MIMO Scheme for next generation WLAN", Xiang Gao (BUPT)
- [11-13-1105](#), "Discussion on Access Mechanism for HEW", Meng Yang (CATR)
- [11-13-1122](#), "Considerations for In-Band Simultaneous Transmit and Receive (STR) feature in HEW", Rakesh Taori (Samsung Electronics)
- [11-13-1126](#), "Beamforming under OBSS Interference", Hongyuan Zhang (Marvell)
- [11-13-1154](#), "DL-MU-MIMO Transmission with Unequal Bandwidth", Yongming Huang (Southeast University)
- [11-13-1155](#), "Space Division Multiplex for OBSS Interference Suppression", Yongming Huang (Southeast University)
- [11-13-1156](#), "TXOP Redundancy NAV Clear", Yongming Huang (Southeast University)
- [11-13-1157](#), "Feasibility of Coordination Transmission for HEW", Yunzhou Li (Tsinghua University)
- [11-13-1168](#), "Requirements on WLAN Ad Push", Hui Tian (BUPT)
- [11-13-1169](#), "WLAN Cellular Offload in High Speed Moving Environment", Hui Tian (BUPT)
- **General**
 - [11-13-1057](#), "Legacy support on HEW frame structure", Wookbong Lee (LG electronics)
 - [11-13-1100](#), "HEW SG Progress Review", Osama Aboul-Magd (HEW SG)
 - [11-13-1115](#), "Possible vision of the HEW-driven Wi-Fi 2020", Minho Cheong (ETRI)
 - [11-13-1163](#), "PAR and 5C: Comments based on 11n", Sean Coffey (RealTek)
 - [11-13-1164](#), "Some PAR and 5C Requirements", Paul Lambert (Marvell)

3. Straw Polls

Several straw polls were conducted to sense the group consensus on topics related to simulation scenarios, evaluation methodologies and channel models.

4. Timeline

The group reviewed the timeline. No changes.

Goals for the November 2013 session

- Hear presentations addressing SS/SM/EM/FR/CM/TECH
 - Attempt to consolidate documents related to the above areas of discussion.
 - Priority will be given to presentations with consolidated views
- Start discussion on PAR related issues
- Motion for SG extension
- WFA feedback on the usage cases

Teleconferences

Three teleconferences are planned before the November 2013 meeting.

Wednesday	October 9 th , 2013	10:00 - 12:00 (ET)
Wednesday	October 17 th , 2013	00:00 - 02:00 (ET)
Wednesday	October 30 th , 2013	10:00 - 12:00 (ET)

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July 2013 — Geneva, Switzerland

The HEW SG had nine sessions during the week.

	Monday	Tuesday	Wednesday	Thursday
AM1			HEW	HEW
AM2		HEW		HEW
PM1			HEW	
PM2	HEW	HEW	HEW	HEW
PM3				

Main Documents

- [11-13-0664-05](#), HEW SG July 2013 Agenda
- [11-13-0861-00](#), HEW SG July 2013 Geneva Meeting Minutes
- [11-13-0922-00](#), HEW SG July 2013 Closing Report

Achievements

1. **The group approved minutes from the face-to-face meeting in Waikoloa, HI and teleconferences held on June 5th and June 19th.**
 - [11-13-0560-02](#), HEW SG May 2013 Waikoloa meeting minutes
 - [11-13-0663-01](#), HEW SG Teleconference minutes 20130605
 - [11-13-0704-00](#), HEW SG Teleconference minutes 20130619

2. Technical Presentations

The group received over 35 submissions in areas of (1) Usage Models/Use Cases, (2) Functional Requirements, (3) Simulation Scenarios and Evaluation Methodology, (4) MAC/PHY techniques as listed below.

- Usage Models/Use Cases
 - [11-13-0657](#), "HEW SG usage models and requirements - Liaison with WFA" Laurent Cariou (Orange)
 - [11-13-0761](#), "Interference Control Use Case for HEW", Fang Xie (CMCC)
 - [11-13-0795](#), "HEW Usage Scenarios Categorization", Eldad Perahia (Intel)
 - [11-13-0802](#), "Proposed re-categorization of the HEW usage models", Yasuhiko Inoue (NTT)
 - [11-13-0836](#), "HEW Usage Models for Backhauls and Floor Automation", Minh Cheong (ETRI)
- Functional Requirements
 - [11-13-0787](#), "Follow up requirements", Wu Tianyu (Huawei)
 - [11-13-0798](#), "Functional Requirements in HEW", Jinsoo Choi (LG Electronics)
 - [11-13-0840](#), "HEW Functional Requirements Follow-up (Preliminary Version for Study Group discussions)", Minh Cheong (ETRI)
 - [11-13-0850](#), "Quantitative QoE Requirements for HEW", Huai-Rong Shao (Samsung)
- Simulation Scenarios and Evaluation Methodology
 - [11-13-0723](#), "HEW SG Evaluation Methodology Overview", Minyoung Park (Intel)
 - [11-13-0728](#), "Network Optimization for Expected HEW Traffic Patterns", Bill Carney (Sony)
 - [11-13-0756](#), "HEW Channel Model", Vinko Erceg (Broadcom)
 - [11-13-0757](#), "Evaluation Methodology and Simulation Scenarios" Nihar Jindal (Broadcom)
 - [11-13-0786](#), "Discussion on System Level Simulation Methodology" Wu Tianyu (Huawei)
 - [11-13-0800](#), "HEW Study Group Documentation", Hemanth Sampath (Qualcomm)

- [11-13-0805](#), "On Definition of Dense Networks and Performance Metric", Jianhan Liu (MediaTek)
- [11-13-0837](#), "Consideration for HEW Evaluation Methodology", Minh Cheong (ETRI)
- [11-13-0847](#), "Evaluation Criteria and Simulation Scenarios" Klaus Doppler (Nokia)
- [11-13-0858](#), "Enhanced Channel Model for HEW", Shahnaz Azizi (Intel)
- [11-13-0869](#), "Simulation scenarios and metrics for HEW", Thomas Derham (Orange)
- [11-13-0872](#), "Clarifications on outdoor deployments", Laurent Cariou (Orange)
- MAC/PHY Techniques
 - [11-13-0712](#), "A Brief Time of History", Larry Taylor (DTC)
 - [11-13-0758](#), "Possible Approaches for HEW", Katsuo Yunoki (KDDI Labs)
 - [11-13-0764](#), "Full-duplex Technology for HEW", Andre Bourdoux (IMEC)
 - [11-13-0765](#), "Full-duplex is an emerging radio paradigm that has the potential to improve the efficiency of future WLANs", Hongliang Bian (China Telecom)
 - [11-13-0768](#), "TD-uCSMA", Riccard Scapigno (ISMB)
 - [11-13-0801](#), "Issues of Low Rate Transmissions", Akira Kishida (NTT)
 - [11-13-0843](#), "Further Evaluation on outdoor Wi-Fi", Wookbong Lee (LG Electronics)
 - [11-13-0849](#), "New Techniques: Enabling Real World Improvement By Exposing Internal MAC state", Brian Hart (Cisco)
 - [11-13-0852](#), "Potential approach to improve WLAN BSS edge performance", Juho Pirskanen (Renesas Mobile)
 - [11-13-0854](#), "Consideration on Efficiency Enhancement", SangHyun Chang (Samsung)
 - [11-13-0865](#), "Video Data Rate for HEW", Huai-Rong Shao (Samsung)
 - [11-13-0871](#), "Discussion on Potential Techniques for HEW", Timo Koskela (Renesas Mobile)
 - [11-13-0877](#), "HEW Beamforming Enhancements", James Wang (MediaTek)
 - [11-13-0878](#), "Efficiency enhancement for dense WLAN environment", Jeongki Kim (LG Electronics)
- 3. HWE SG Initial Usage Models

The group approved document [11-13-0657-06](#) as HEW SG initial draft of Usage Models and to send it to Wi-Fi Alliance asking for prioritization of the use cases and additional feedbacks.
- 4. Liaison to the Wi-Fi Alliance

The group also approved a liaison letter to the Wi-Fi Alliance contained in the document [11-13-0902-01](#).
- 5. The group passed motion to extend the SG.
- 6. Timeline

The group discusses the timeline.

TGax Initial Timeline	
May 2013	Start of the HEW SG
July 2013	Presentations, SG extension
September 2013	Presentations
November 2013	Presentations, initial PAR and 5C, and SG extension
January 2014	Presentations, final PAR and 5C, WG approval
March 2014	Presentations, EC approval of PAR and 5C
May - June, 2014	NesCom approval of PAR and 5C
July 2014	Start of a new TG

Goals for September 2013 session

During the September 2013 meeting, the HEW SG continues discussions on issues related to:

- Usage Models/Use Cases

- Functional Requirements
- Feasibility
- Scope and Process

Teleconferences

Two teleconferences are planned before the September 2013 session.

Wednesday	August 7 th , 2013	10:00 - 12:00 (ET)
Wednesday	August 27 th , 2013	20:00 - 22:00 (ET)

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May 2013 — Waikoloa, HI

HEW SG had six sessions during the week. The TGax had 10 sessions during the week.

Four out of ten sessions were assigned to the ad hoc groups.

	Monday	Tuesday	Wednesday	Thursday
AM1				HEW
AM2		HEW		HEW
PM1				
PM2	HEW		HEW	HEW
PM3				

Main Documents

- [11-13-0400-04](#), HEW SG May 2013 Agenda
- [11-13-0560-02](#), HEW SG May 2013 Waikoloa Meeting Minutes
- [11-13-0624-00](#), HEW SG May 2013 Closing Report

Achievements

1. **The group decided leadership structure to have one chairperson and one secretary.**
 - Chair: Osama Aboul-Magd (Huawei Technologies)
 - Secretary: Yasuhiko Inoue (NTT)
2. **The group received 22 submissions as listed below.**
 - **Usage Models/Use Cases**
 - [11-13-0514](#), "HEW Usage Scenarios and Applications", Eldad Perahia (Intel)
 - [11-13-0538](#), "Dense apartment building use case for HEW", Klaus Doppler (Nokia)
 - [11-13-0554](#), "Use Cases", Minho Cheong (ETRI)
 - [11-13-0567](#), "Proposed HEW Usage Models", Yasuhiko Inoue (NTT)
 - [11-13-0527](#), "Usage Models for Next Generation", David Xun Yang (Huawei) and James Wang (MediaTek)
 - [11-13-0534](#), "Direction and Use Cases for HEW", HanGyu Cho (LG Electronics)

- 11-13-0563-00, "D2D Technology for HEW", Zhanji Wu (BUPT) - not presented

- **Problem Statements**

- [11-13-0505](#), "MAC Efficiency Analysis for HEW SG", Minyoung Park (Intel)
- [11-13-0545](#), "WLAN QoE, End User Perspective Opportunities to Improve", Veli-Pekka Ketonen (7 signals)
- [11-13-0523](#), "Understanding Current Situation of Public Wi-Fi Usage - Possible Requirements for HEW -", Katsuo Yunoki (KDDI Labs)
- [11-13-0539](#), "Efficient Frequency Spectrum Utilization", Yongho Seok (LG Electronics)
- [11-13-0544](#), "Discussions on 11ac PHY efficiency", Jianhan Liu (MediaTek)
- [11-13-0536-00](#), "HEW SG PHY Considerations For Outdoor Environment", Wookbong Lee (LG Electronics)
- [11-13-0576](#), "Performance Evaluation for 11ac", Wu Tianyu (Huawei Technologies)
- [11-13-0556](#), "Wi-Fi interference measurements in Korea - Part 1", Minh Cheong (ETRI)
- [11-13-0549](#), "A perspective on what any High Efficiency Wireless TG should and should not do", Brian Hart (Cisco Systems)

- **Requirements**

- [11-13-0524](#), "HEW Functional Requirements", Wu Tianyu (Huawei Technologies)
- [11-13-0555](#), "Considerations on Functional Requirements for HEW", Minh Cheong (ETRI)

- **Scenarios and Metrics**

- [11-13-0503](#), "Discussion on Basic Technical Aspects for HEW", Juho Pirskanen (Renesas Mobile)
- [11-13-0542](#), "HEW Scenarios and Goals", Simone Merlin (Qualcomm)
- [11-13-0486](#), "HEW - Metrics, Targets and Simulation Scenarios", Ron Porat (Broadcom)
- [11-13-0520](#), "HEW scenarios and evaluation metrics", Thomas Derham (Orange)

- **Technical Feasibility**

- [11-13-0558](#), "Coexistence and Optimization of Wireless LAN: Time, Frequency, Space, Power, and Load", Jim Lansford (CSR)

3. Liaison to the Wi-Fi Alliance

- The group agreed to ask the Wi-Fi Alliance for input about priority of the use cases.
- Laurent Cariou (Orange) volunteers to develop the use case document.

4. Project planning

- The group discussed about the project plan based on the submission [11-13-0616-02](#) by Phil Barber (Huawei)
- Discussion to be continued in the July meeting.

Goals for July 2013 session

During July 2013 session, the HEW SG will continue discussions on:

- Use Cases,
- Functional Requirements,
- Feasibility,
- Scope and Process.

Teleconferences

Two teleconferences are planned before the July 2013 session.

Wednesday	June 5 th , 2013	10:00 - 12:00 (ET)
Wednesday	June 19 th , 2013	20:00 - 22:00 (ET)

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Related documents

Documents referenced in the motion that led to the creation of the study group

- <https://mentor.ieee.org/802.11/dcn/13/11-13-0339-10-0wng-high-efficiency-wlan-straw-poll.ppt>

Press release document

- <https://mentor.ieee.org/802.11/dcn/13/11-13-0418-02-0000-proposed-edits-to-hew-press-release.doc>
-

Useful links to other web sites

IEEE P802.11 WLANs RELATED

- [Home](#)
- [IEEE 802.11 Wiki](#)
- [E-mail Reflectors Archives \(Members Only\)](#)

OTHER SITES

- [IEEE P802 LAN/MAN Standards Committee \(LMSC\)](#)
-

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