IEEE P802.11  
Wireless LANs

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| Minutes of the IEEE P802.11 Full Working Group Session | | | | |
| Date: 2025-04-25 | | | | |
| Author(s): | | | | |
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Abstract

This document contains the minutes of the IEEE 802.11 Working Group for the March 2025 Plenary session in Atlanta, Georgia.

Please note that all attendees at this session and their affiliations are shown in Annex D.

Revision history:

R0: initial version for review by WG members

R1: updated/corrected before May Interim session

Abbreviations:

Q: Question

C: Comment

A: Answer

SP: Straw Poll

**IEEE 802.11 Plenary Session #210**

**March 9th – 14th, 2025, Atlanta, Georgia**

# IEEE 802.11 Opening Plenary, Monday March 10th, 2025

1. **Opening** (WG Chair Opening Report: [11-25/0197r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0197-01-0000-2025-march-working-group-chair-opening-report.pptx))

## Meeting Call to Order

The session was called to order at 10:36 EST by the Chair, Robert Stacey (Intel) who declared quorum for the session.

## Officer and IEEE SA staff introduction

Chair: Robert Stacey Intel

1st Vice-chair: Jon Rosdahl Qualcomm

2nd Vice-chair: Stephen McCann Huawei Technologies Co., Ltd

Secretary: Volker Jungnickel Fraunhofer Heinrich Hertz Institute

IEEE SA Staff present: Christy Bahn

Fred J. Schindler, Vice president IEEE Technical Activities introduced himself. His main interest is collaboration with standards is main interest. Standards are important for industry. I am happy to talk to people.

There was a short technical break because the video was not visible.

There were 187 people attending in person altogether in the room, 339 were recorded online (11:19) and 512 registered in the attendance tool (IMAT).

Please note that this session requires a registration fee to be paid.

## Meeting Decorum

Chair: Please, note the information about the session decorum.

Are there any members of the press present?

* + None.

## Review and approve 802.11 session agenda (WG Agenda [11-25/0196r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0196-02-0000-2025-march-wg11-agenda.xlsx))

This is a summary of the March Plenary. Please, note the schedule for this session on the separate tab “Schedule Graphic”.

There were a few updates from yesterday’s Chair’s Advisory Committee (CAC) meeting. The chair highlighted one changes for the meeting slots: Deleted: 2025-03-11 19:30-21:30 Coex SC (Grand Ballroom B - Level 2).

Subgroup Chairs, please contact Stephen to obtain the teleconference host keys.

**Move to approve the agenda** [**11-25/0196r**](https://mentor.ieee.org/802.11/dcn/25/11-25-0196-02-0000-2025-march-wg11-agenda.xlsx)**2 for the Monday opening plenary.**

Mover: Al Petrick, 2nd: Harry Bims

**No objection to approving by unanimous consent.**

## Review and approve January 2025 WG session minutes

**Move to approve the January 2025 WG session minutes document** [**11-24-2130r2.**](https://mentor.ieee.org/802.11/dcn/24/11-24-2130-02-0000-minutes-working-group-january-2025.docx)

Mover: Volker Jungnickel, 2nd: Bo Sun

**No objection to approving by unanimous consent.**

## New attendees

**Straw Poll: Are you a new attendee to IEEE 802.11?**

Yes: 4 (in the room) and 6 (online).

There will be a New Members meeting at this session on Monday March 10th at PM1 13:30 local time in Grand Ballroom C. Everyone is welcome to join this meeting.

1. Announcements

## Policies and procedures (2nd Vice Chair Report: [11-25/0214r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0214-01-0000-2nd-vice-chair-report-march-2025.pptx))

* + 1. Review Patent Policy Slides (slides 3-7)

The current PatCom rules were read out, including the call for essential patents information, as shown by <https://development.standards.ieee.org/myproject/Public/mytools/mob/patut.pdf>

There were no responses to the call for essential patents. No questions.

* + 1. Review Copyright Slides (slide 8-9)

The current IEEE SA copyright policy slides were presented.

* + 1. IEEE SA Participation Slides (slides 10-14)

The current IEEE SA meeting participation slides were read.

* + 1. IEEE SA Policy Documents (slide 13)

The current IEEE SA policy documents were read. No questions.

* + 1. IEEE SA Rules Documents (slide 14)

The current IEEE SA rules documents were read.

* + 1. 802 Ground Rules (slide 15)

The current IEEE 802 ground rules were read.

* + 1. IEEE 802 Rules Documents (slide 16)

The current IEEE 802 rules documents were read.

* + 1. IEEE 802.11 Operations Manual (slide 17)

Latest version of 802.11 Operations Manual is doc. [11-22/1638r4](https://mentor.ieee.org/802.11/dcn/22/11-22-1638-04-0000-802-11-operations-manual.docx). No changes this time.

* + 1. Voting rule reminder (slides 18-19)

Remember to record your attendance for this session. To achieve 75%, which counts towards a voting credit for this session, you must attend 12 meeting slots. Take care of losing voting rights and do your ballots. If a working group letter ballot fails, the length is only 1. There is also a reminder about the abstain vote (“lack of expertise” as the only allowed reason).

* + 1. Email reflectors (slides 20-21)

Email reflectors were explained. You need to obtain write permission on Mentor by 75% attendance at one session. If you want to change your email address, please contact the WG officers.

* + 1. Posting documents (slides 22)

Erroneous documents can be corrected by the 802.11 working group officers. Please, send them an email. There are a number of pending documents. Ask WG Chairs to delete them if they are not needed anymore. Secretaries should put “Minutes” in the lower left corner of the document.

* + 1. IEEE Event Conduct and Safety (Slide 23-25)

The corresponding slides were read.

Close captioning during Teleconferences is available.

No questions concerning 2.1.2 to 2.1.12.

## Incoming liaisons (WG Chair Opening Report: [11-25/0197r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0197-01-0000-2025-march-working-group-chair-opening-report.pptx))

### 2.2.1 Summary of new and pending liaisons and processing this week (slide 4)

There is no new liaison since January 2025. For the liaison website, see

<https://grouper.ieee.org/groups/802/11/Liaisons/Liaisons-and-External-Communications.html>

## Report on 802 LMSC or IEEE SA Standards Board decisions (slides 5-6)

March 2025: P802.11bf and P802.11bk (conditional) to RevCom, P802.11br PAR to NesCom

March 24-28, 2025 – NesCom/RevCom/SASB (Feb 15, 2025, submission deadline): P802.11br PAR

May 7, 2025, NesCom/RevCom telecon (Mar 28, 2025, submission deadline): P802.11bk and P802.11bf

1. Logistics, key events/activities (WG Chair Opening [11-25/0197r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0197-02-0000-2025-march-working-group-chair-opening-report.pptx))

## Working group session documents (see slide 7)

## Joint meetings & reciprocal credit with IEEE 802 groups (slides 8-11)

At the March 2025 Atlanta session, attendance at 12 meeting slots is needed to obtain a 75% voting credit, which is required to maintain voting rights.

Reminder that there are topics relevant to IEEE 802.11 to be covered in IEEE 802.18, IEEE 802.19, IEEE 802.24, IEEE 802.1 and IEEE 802 JTC1 SC. If you attend an 802.11 meeting, you will receive credit in the other group, and if you attend a meeting in the other group, you will receive 802.11 credit. For 802.18, this only applies to the timeslots when 802.18 meets. For the other groups, any timeslot gives reciprocal credit. There is information on the details for meetings of these groups: 802.18 (Slide 9), 802.19 (Slide 10), other 802 meeting (Slide 12).

## Session information (ATL-802\_0325\_ThingsToKnow\_Hilton Atlanta: [ec-25/0037r0](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0037-00-LMSC-atl-802-0325-thingstoknow-hilton-atlanta.pptx))

* Contact Information (Slide 2-3). Network information and local file server access. WLAN SSID: IEEE802, Password: ieeeieee. IEEE 802 Documents: Local Document Server <http://ieee802.linespeed.com/> (Slide 3)
* Audio-Visual (Slide 4).
* Registration desk opening hours. Registration is required. Wear your badge (Slide 5).
* Mixed Mode Orientation and Newcomer Training (Slide 6).
* Schedule and Attendance Recording attendance. Please remember to record your attendance in IMAT for each meeting slot you attend. Also remember to pay your registration fee for this session. Use the QR code in the area to find the session schedule, which may be updated (Slide 7).

## Meeting room locations

Meeting Room assignments (Slide 8). Meeting room location graphics (Slides 9-10).

## Breakfast, breaks, social logistics (Slides 11-12)

Breakfast and Lunch in Crystal Ballroom. AM and PM break in PreFunction Area. Wear your badge. WED Social is a visit in Georgia Aquarium (Slide 12). Tickets are required and available until TUES 2 p.m. Food, Beverage and Transportation are included. Link for Atlanta sightseeing (Slide 13). Take care that daylight saving time starts on Sunday, March 13, at 2 a.m., the clocks are set to 3 a.m. Next Plenary session in Madrid July 27-Aug. 1, which is an unusual time of the month (Slide 13).

No questions.

1. Opening reports, activities and plans

## WG reports ([11-25/0197r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0197-01-0000-2025-march-working-group-chair-opening-report.pptx))

* + Please note that 802.18 meets on TUES AM2 and FRI AM1 this week (Slide 9).
  + Please note that 802.19 meets on MON and THUR from 6:30-8:30 p.m. (Slide 10).
  + For other 802 meetings, see Slide 11.

## IEEE 802.11 groups

Overview of subgroups (Slide 12).

### 802.11 PARs

TGbi PAR expires in 2025, to be renewed (slide 13).

* + 1. Appointed positions and officers (Slides 14-16).

Jonghoe Koe is the new secretary of TGbq.

* + 1. Standards pipeline and 802.11 revisions (slides 16-17).

TGbq started in February 2025.

* + 1. Summary of ballots and comment collections (Slide 18).
    2. Membership summary (Slide 19).

Updated in January. 802.11 is moving towards 700 voting members at the next plenary.

* + 1. WG membership and attendance statistics (Slides 20-24).

New: In-person vs. remote in 2024 and 2025. There is gradual increase of in-person attendance over this period (Slide 23). Same resolved vs. number of sessions attended. Only 6% participated remote only. (Slide 24).

## Timeline reports

All timelines can be found at <https://www.ieee802.org/11/Reports/802.11_Timelines.htm>. Subgroup Chairs, please send updates to the 2nd Vice Chair.

## WG Technical Editor ([11-25/0216r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0216-01-0000-march-2025-snapshot-slides.pptx), Slide 3)

January report in [11-25/0097r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0097-01-0000-january-2025-editors-meeting.pptx). Meeting slot on TUES 7:00-8:00 a.m. March agenda in [11-25/0456r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0456-00-0000-march-2025-editors-meeting.pptx).

Roll Call / Contacts / Reflector. Brief status report. Amendment alignments and draft development snapshot. Review Publication Process. Form publication review committees. Editorial Style Guide updates and issues for feedback. ANA number spaces.

Main topic will be the 802.11-2024 edition review.

No questions.

* + 1. WG ANA report ([11-25/0216r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0216-01-0000-march-2025-snapshot-slides.pptx), slide 4)

ANA number spaces, latest database is [11-11/0270r77](https://mentor.ieee.org/802.11/dcn/11/11-11-0270-77-0000-ana-database.xls) (March 2025).

Changes since January 2025: TGbi allocations and releases

No questions.

## Standing committee reports ([11-25/0216r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0216-01-0000-march-2025-snapshot-slides.pptx))

* + 1. AIML Artificial Intelligence/Machine Learning SC (slide 5)

January meeting minutes [11-25/0224r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0224-00-aiml-aiml-sc-january-2025-interim-meeting-minutes.doc). One meeting slot on WED AM2. Agenda in [11-25/0188r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0188-00-aiml-aiml-sc-march-2025-atlanta-plenary-agenda.pptx). One technical contribution. One technical report proposal.

* + 1. ARC Architecture SC (slides 6-7)

January meeting minutes in [11-24/2119r0](https://mentor.ieee.org/802.11/dcn/24/11-24-2119-00-0arc-arc-sc-mixed-mode-minutes-january-2025-interim.docx). 3 meeting slots TUES PM1, WED AM1, THUR PM1. Agenda in [11-25/0222r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0222-01-0arc-arc-sc-agenda-march-2025.pptx).

Contribution/discussion topics: IEEE Std 802 revision project update effects on 802.11 – TUES. Continue technical discussions on next slide. Annex G: Discussion of way forward – WED and THUR. Liaison from WBA on QoS, and L4S – Deferred until TGbn and REVmf consider this topic. On hold, pending contribution: MLME-RESET, versus MLME-JOIN, MLME-START, MLME-SCAN and MLME-END. One aspect is how MAC address is set/controlled – related to IEEE 1609/TGbd.

Several points related to IEEE Std 802 updates: EPD and LPD, MAC address ordering, 802.1AC mapping from ISS to 802.11 MAC SAP interface. Remove 802.2/LLC terms. 802.11’s “Portal”, mapping to/usage of IEEE Std 802 terminology. Access Domains, DS as a bridge, VLANs in 802.11 (Security domains, Authenticator relationship, VLAN-aware STAs), GLK/non-GLK STAs? (cf. [11-08/0114r0](https://mentor.ieee.org/802.11/dcn/08/11-08-0114-00-0wng-segregated-data-services.ppt)).

* + 1. COEX Coexistence SC (slide 8)

January meeting minutes in [11-25/0072r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0072-00-coex-january-2025-minutes.docx). Chair is not on site but chairs the meeting. 2 meeting slots TUES AM2, THUR AM1. Agenda in [11-25/0208](https://mentor.ieee.org/802.11/dcn/25/11-25-0208-00-coex-coex-sc-agenda-march-2025.xlsx)r0.

Topics: ETSI BRAN Update, BT SIG Update. 802.15.4ab NB Status Update. Note there is no joint session this time. Other topics: Please respond to the call for submissions / contact chair.

* + 1. PAR Project Authorization Request Review SC (Slide 9)

There was no meeting in January. Agenda in [11-25/0246r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0246-00-0PAR-par-review-sc-mtg-agenda-and-comment-slides-2025-atlanta.pptx). Two meeting slots: MON PM1, THUR AM2. Should be finished during the first meeting. PARs to be considered in March:

* P802.1AS - Standard - timing and Synchronization for Time-Sensitive Applications - Revision to IEEE Standard 802.1AS-2020, [PAR](https://www.ieee802.org/1/files/public/docs2025/as-draft-PAR-0125-v01.pdf)
* P802.3dp - Amendment - Cabling Restrictions for Single Pair Power over Ethernet (SPoE), [PAR](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0020-00-LMSC-draft-ieee-p802-3dp-par.pdf) and [CSD](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0021-00-LMSC-draft-ieee-p802-3dp-csd.pdf)
* P802.11br - Amendment - Enhanced Light Communications, [PAR](https://mentor.ieee.org/802.11/dcn/25/11-25-0185-00-0elc-draft-p802-11br-par.pdf) and [CSD](https://mentor.ieee.org/802.11/dcn/24/11-24-1600-03-0elc-csd-proposal-for-elc.docx)
* P802.15 - Standard  for Low Rate Wireless Networks - Corrigendum to IEEE Standard 802.15.4-2024, [PAR](https://mentor.ieee.org/802.15/dcn/25/15-25-0054-01-0mag-par-for-802-15-4-2024-corrigendum-1.pdf)

Review the 3 marked (4 dots) PARs on MON PM1 and then post feedback to 802 LMSC Reflector by Tuesday 18:30. Feedback to be reviewed on THUR, AM2.

* + 1. WNG Wireless Next Generations SC (Slide 10)

There was no meeting in January. Agenda for March in [11-25/0212r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0212-00-0wng-agenda-for-wng-sc-2025-march.pptx). One meeting slot TUES AM1. There will be 4 presentations for this plenary:

[11-25/0460r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0460-01-0wng-intrinsic-vulnerabilities-of-the-mimo-channel-sounding-procedure.pptx) “Intrinsic vulnerabilities of the MIMO channel sounding procedure”, Francesca Meneghello (Northeastern University), [11-24/1103r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1103-01-0wng-post-quantum-802-11.pptx) “Post-Quantum 802.11”, Dan Harkins (HPE), [11-25/0218r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0218-00-0wng-post-quantum-opportunistic-wireless-encryption-owe.pptx) “Post-Quantum Opportunistic Wireless Encryption (OWE)”, Alex Lungu (Samsung), [11-25/0420r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0420-01-0wng-802-11-vlan-support.pptx) “802.11 Support of VLANs”, Donald Eastlake (Independent).

* + 1. JTC SC1 (Slides 11-13)

January meeting minutes in [ec-25/0016r1](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0016-01-JTC1-minutes-of-mixed-mode-meeting-in-january-2025.docx). One meeting slot TUES PM2. Agenda in [ec-25-0017r01](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0017-01-JTC1-agenda-for-march-2025-mixed-mode.pptx).

Review the status of PSDO process. Review liaisons & notifications of projects to SC 6. Review status of ballots.

A large number of IEEE 802 submissions ought to be in the PSDO balloting & publication process – but there are IPR issues with 802.11ba, 802.11ax and 802.11ay (slide 12). IEEE 802 has 110 standards in or through the PSDO pipeline, with 28 in-process (Slide 13).

## Task Group reports

* + 1. TGmf 802.11 Maintenance Project (Slide 14)

January meeting minutes [11-24/2109r0](https://mentor.ieee.org/802.11/dcn/24/11-24-2109-00-000m-minutes-for-revmf-2025-january-interim-kobe.docx). 2 meeting slots MON & WED PM2. Agenda in [11-25/0219r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0219-00-000m-revmf-agenda-march-2025-session.pptx).

IEEE 802.11-2024 is in the process of publication – targeted for the end of March. P802.11bh and P802.11be are also in the process of being published as amendments, targeted for April.

Discuss contributions on modifications to the REVme D7.0 draft – for consideration in initial REVmf draft. Discuss contributions on topics involving other amendments under publication.

* + 1. TGbf WLAN Sensing (Slides 15-16)

January meeting minutes in [11-25/0173r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0173-01-00bf-ieee-802-11bf-january-2025-interim-meeting-minutes.docx). No Telco. 2 meeting slots TUES & THURS AM2. March agenda in [11-25/0223r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0223-00-00bf-tgbf-meeting-agenda-2025-03-plenary.pptx).

Status: The 3rd SA Ballot Recirculation for P802.11bf is closed and passed. Open date 06 Jan 2025, close date 16 Jan 2025. Approval rate: 98%. Received 0 comments

Goals for March 2025: 2 meeting slots scheduled for TGbf. P802.11bf report to 802 LMSC on Conditional approval to forward draft to RevCom. Start fourth recirculation of the SA ballot. CSD Re-affirmation. Conditional forward to REVcom. This might be the last meeting for TGbf.

* + 1. TGbi Enhanced Service with Data Privacy Protection (slide 17)

Minutes for January [11-25/0157r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0157-00-00bi-tgbi-minutes-for-januray-2025-interim-meeting.docx). 4 meeting slots: MON PM2, TUES PM2, WED AM2, THUR AM1. Agenda in [11-25/0225r](https://mentor.ieee.org/802.11/dcn/25/11-25-0225-00-00bi-tgbi-march-plenary-agenda.pptx)0.

Status: TGbi has an approved draft with an approval rate of 89%. Received 1072 comments in the comment collection. 16 CID unassigned, 1056 assigned.

* + 1. TGbk 320 MHz Positioning (Slide 18-19)

There was no meeting in January. Minutes on Telcos in [11-25/0429r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0429-00-00bk-minutes-for-telecons-between-nov-2024-and-march-2025.docx). Agenda for March in [11-25/0232r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0232-00-00bk-tgbk-march-meeting-agenda.pptx).

Status: 1st recirculation SA ballot completed Feb 7th. Approval rate: 96%. Received 21 comments: 13 T / 8 E. Hope that 2nd recirculation is successful.

Targets for March: Complete response to 1st SA recirculation. Approve 2nd recirculation targeting unchanged draft. Approve the report to EC requesting conditional approval to forward draft to RevCom. The hope is to have no changes in the next draft.

Future scheduled telecons: TUES March 18, 10:00 am PT/13:00 ET (2hrs) just in case it is needed.

* + 1. TGbn Ultra-High Reliability (UHR, slides 19-20)

January joint meeting minutes in [11-25/0239r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0239-00-00bn-tgbn-january-2025-meeting-minutes.docx), PHY, MAC ad-hoc minutes in [11-25/0145r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0145-01-00bn-tgbn-mac-ad-hoc-jan-2025-kobe-minutes.docx) and [11-25/0158r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0158-00-00bn-minutes-for-tgbn-phy-ad-hoc-in-january-2025-interim.docx), respectively. Held 6 telcos between January and March 2025 (agenda: [11-25/0207r11](https://mentor.ieee.org/802.11/dcn/25/11-25-0207-11-00bn-jan-mar-tgbn-teleconference-agenda.docx), minutes [11-25/0409r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0409-00-00bn-tgbn-january-2025-to-march-2025-teleconferences-minutes.docx)).

17 meeting slots in March (3x Joint, 6x MAC, 6x PHY) MON AM1 (PHY/MAC), MON PM1 (ALL), TUES AM2 & PM1 & PM2 (PHY/MAC), WED AM1 & PM2 (PHY/MAC), THUR AM1 (PHY/MAC), THUR PM1 & PM2 (ALL). Agenda in [11-25/0221r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0221-01-00bn-tgbn-mar-2025-meeting-agenda.pptx).

Status: Telcos discussed ~40 submissions, 3 PDTs, ran ~ 5 straw polls covering a variety of topics. Coordinated spatial reuse (CSR), non-primary channel access (NPCA), multi-AP framework (MAP), Distributed resource units (DRUs), coordinated RTWT, coordinated TDMA (C-TDMA), roaming, sounding, coordinated beamforming (CBF), interference mitigation, stream classification service (SCS), security, TXOP sharing, coexistence, dynamic subchannel operation (DSO), low latency, etc. Started/closed comment collection (CC50) on TGbn D0.1 (~4000 comments, [11-25/0296r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0296-01-00bn-ieee-802-11bn-cc50-comments-on-d0-1.xlsx)).

Targets for March: Complete comment assignment of comments from CC50 and initiate comment resolution phase. Presentation of proposed draft texts (PDTs), comment resolution (CR), and technical submissions.

Still ~150 pending submissions and ~25 pending SPs on presented submissions as of yesterday. Continue populating the TGbn SFD with approved concepts. Work towards delivering TGbn D1.0.

* + 1. TGbp Ambient Power (slide 22-24)

January meeting minutes in [11-25/0146r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0146-00-00bp-2025-01-interim-meeting-minutes.docx). 3 Telcos were held since January Interim session, focusing on review of updated SFD and open technical discussion (agenda: [11-25/0227r3](https://mentor.ieee.org/802.11/dcn/25/11-25-0227-03-00bp-tg-bp-tc-agenda-till-mar-2025.pptx), minutes: [11-25/0240r3](https://mentor.ieee.org/802.11/dcn/25/11-25-0240-03-00bp-teleconference-minutes-february-march-2025.docx)). 8 meeting slots in January: MON PM1 & PM2, TUES AM1 & PM2, WED AM1 & PM2, THUR AM2 & PM1, all in Grand Ballroom. Agenda in [11-25/0228r](https://mentor.ieee.org/802.11/dcn/25/11-25-0228-02-00bp-tg-bp-meeting-agenda-for-mar-plenary-2025.pptx)1.

Goal for the TGbp meeting this week: Open technical discussion and improve FRD/SFD documents based on consensus. Timeline is unchanged (Slide 24).

* + 1. TGbq Integrated Millimeter-Wave (IMMW, slide 25)

Kick-off Telco on Feb. 26, 2025 (Agenda: [11-25/0190r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0190-01-00bq-tgbq-agenda-26-february-2025.xlsx)). Jonghoe Koo was appointed as secretary. Telco minutes in [11-25/0330r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0330-02-00bq-tgbq-february-26-2025-teleconference-call-meeting-minutes.docx). Two meeting slots in Atlanta: WED AM2, THUR AM2. Agenda in [11-25/0205r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0205-01-00bq-tgbq-agenda-2025-march-plenary.xlsx).

Plans for March: Vice chair election and confirmation. Editor appointment. Discuss contributions on scope, timeline and operation aspect of the project. Discuss technical contributions.

This is also a request to submit contributions for those who could not make it this time, which will be handled in forthcoming teleconferences.

## Study Group, Technical Interest Group, Ad-hoc Group reports

* + 1. ELC SG Enhanced Light Communications (slide 26)

January 2025 Kobe Interim meeting minutes: [11-25/0160r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0160-02-0elc-elc-2025-01-minutes.docx). 3 meeting slots: Tuesday AM1 & EVE (19:30-21:30). Agenda in [11-25/0347r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0347-00-0elc-march-2025-elc-agenda.pptx).

Goals for March: Comment resolution on the draft ELC PAR (doc. [11-25/0185r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0185-00-0elc-draft-p802-11br-par.pdf)) and on the draft ELC CSD (doc. [11-24/1600r3](https://mentor.ieee.org/802.11/dcn/24/11-24-1600-03-0elc-csd-proposal-for-elc.docx)).

* + 1. AUTO TIG Automotive

Minutes for January [11-25/0159r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0159-00-auto-january-2025-kobe-auto-tig-meeting-minutes.docx). 1 meeting slot: MON PM1. Agenda in [11-25/0213](https://mentor.ieee.org/802.11/dcn/25/11-25-0213-00-auto-agenda-for-automotive-tig-2025-march.pptx)r0.

Goals for March: Discuss 4 contributions:

“IEEE 802.11ai and IEEE 802.11bc for Automotive Use”, Hitoshi Morioka (SRC Software)

“Hybrid MLD for Automotive”, Federico Lovison (Cisco)

“Automotive-TIG-Thoughts on PHY improvements”, Azin Neishaboori (General Motors)

“Proposed IEEE802.11 Automotive TIG Technical Report Text on Regional HD Map Updates use case,” Jing Ma (Toyota)

Call for submissions for March 2025. Try to get all information together. Discuss timeline.

1. Selected Liaison Report

## 802.18 Regulatory ([11-25/0287r3](https://mentor.ieee.org/802.11/dcn/25/11-25-0287-03-0000-802-18-liaison-report-march-2025.pptx))

Membership (64V, 3NV, 13A) and Officer introduction (Slide 2).

Progress since January (Slide 3): Reviewed the [latest ongoing consultations](https://mentor.ieee.org/802.18/documents?is_dcn=0001&&is_group=0000&&is_year=2024). Approved the following IEEE 802 LMSC submissions: France ARCEP: [Draft decision repealing decision no. 2007-0683 of 24 July 2007 as amended and setting the conditions for use of radio frequencies for equipment operating using ultra-wideband technology](https://mentor.ieee.org/802.18/dcn/24/18-24-0129-02-0000-proposed-response-to-france-arcep-s-consultation-on-uwb.pdf). UK Ofcom: [Ofcom’s Plan of Work 2025/26](https://mentor.ieee.org/802.18/dcn/25/18-25-0002-04-0000-draft-response-to-uk-ofcom-s-consultation-plan-of-work-2025-26.pdf) .Approved the following liaison statements: [Response to ITU-R Working Party 5C on technical and operational characteristics of their systems operating in the range 450 GHz to 1000 GHz](https://mentor.ieee.org/802.18/dcn/25/18-25-0004-04-0000-proposal-of-a-liaison-statement-to-itu-r-working-party-5c.pdf) . [Information to ITU-R Working Parties 5A and 5C on IEEE Std 802.15.3TM-2023](https://mentor.ieee.org/802.18/dcn/25/18-25-0005-03-0000-proposal-of-a-liaison-statement-to-itu-r-working-parties-5a-and-5c.pdf) Discussed the latest topics related to spectrum and regulation in Europe, North America, and Asia Pacific.

Objectives for March (Slide 4): Review and approve draft responses to the following consultations: UK Ofcom: [Updating Wireless Telegraphy Licence Exemptions](https://www.ofcom.org.uk/spectrum/radio-equipment/consultation-updating-wireless-telegraphy-licence-exemptions/). UAE TDRA: [UAE Spectrum Outlook 2026 – 2031](https://tdra.gov.ae/en/Participation/consultations/details?id=3814). Australia ACMA: [Draft Five-year spectrum outlook 2025-30](https://www.acma.gov.au/consultations/2025-03/draft-five-year-spectrum-outlook-2025-30-consultation). Discuss the latest topics related to spectrum and regulation in Europe, North America, and Asia Pacific.

There is an invited presentation on TUES AM2: [Canada Spectrum Outlook](https://mentor.ieee.org/802.18/documents?is_dcn=0007&&is_group=0000&&is_year=2025) presented by Yan Losier (A/Director, Engineering, Planning and Standards Branch, Department of Innovation, Science and Economic Development Canada / Government of Canada).

1. New Business

## Announcement of individual experts:

* Prof. Alphan Sahin, University of South Carolina, AIML
* Alex Lungu, Samsung Cambridge Solution Centre, WNG and Mid-week plenary
* Emily Qi, Self, Editors

## WAA liaison relationship ([11-25/0197r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0197-02-0000-2025-march-working-group-chair-opening-report.pptx), Slide 26)

* We have had a presentation on WAA and a Straw Poll recently. The Motion to establish the relationship will be made on Friday.

## How to include 802.11 calendar into Outlook (slide 27).

* Found way to reduce the size of that file as explained in the following [link](https://calendar.google.com/calendar/ical/802.11calendar%40gmail.com/public/basic.ics?start-min=2025-01-01). You can select to open a new calendar or integrate it into your existing one.

## IEEE SA Awards (slide 28)

* If you want to nominate your peers for an award, please use the link in that slide.

## Subgroup chairs to update timelines.

* There is a new line for TGbq.

1. Recess

Chair: We are now in recess.

The meeting recessed at 12:02 EST.

# IEEE 802.11 Mid-week Plenary, Wednesday, March 12th, 2025

1. Opening

## Call to order

The meeting was called to order at 13:32 EST by the Chair, Robert Stacey (Intel).

## WG Officer and IEEE SA staff introduction

Chair: Robert Stacey Intel

1st Vice-chair (VC1): Jon Rosdahl Qualcomm

2nd Vice-chair (VC2): Stephen McCann Huawei Technologies Co., Ltd

Secretary: Volker Jungnickel Fraunhofer Heinrich Hertz Institute

IEEE SA Staff present: Christy Bahn, Fred J. Schindler

There were 104 people attending in person (in the room), 331 (online 14:11) and 455 recorded in the attendance tool (IMAT).

## Review and approve agenda, incl. agenda graphic (Meeting agenda [11-25/0196r](https://mentor.ieee.org/802.11/dcn/25/11-25-0196-04-0000-2025-march-wg11-agenda.xlsx)4)

Chair: There have been some schedule changes to the agenda since the opening plenary.

Release/Delete: Thursday AM1 CoEx removed. Thursday AM2 TGbf removed. Wednesday PM2 TGbn(PHY) removed. Thursday AM1 TGbn (PHY) removed.

Chair went through the agenda. There are Motions and a discussion of Post-Quantum Cryptography with the intent of creating a PAR Study Group.

**Approve the agenda for today’s meeting as shown in** [**11-25/0196r4**](https://mentor.ieee.org/802.11/dcn/25/11-25-0196-04-0000-2025-march-wg11-agenda.xlsx)

Mover: Donald Eastlake, Second: Tuncer Baykas

**No objection to approving by unanimous consent.**

1. **Announcements** (WG Chair Supplementary [11-25/0198r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0198-00-0000-2025-march-working-group-chair-supplementary-material.pptx))

## Policies and Procedures (slides 4-8)

The Chair reminded the group about the Code of Ethics and Conduct and the IEEE-SA Standards Board Bylaws.

## Call for essential patents(slide 9)

The Chair read the Call for Essential Patents. No statements were made. No questions.

## Meeting decorum (slide 10)

The Chair introduced rules for proper decorum during the meeting. Do not take photos during the meeting. No press in the room. Check Audio settings if you are in-person, don’t connect. No questions. Use the Webex Chat to enter the queue.

## Session-specific additional designated experts (slide 11)

* Prof. Alphan Sahin, University of South Carolina, AIML
* Alex Lungu, Samsung Cambridge Solution Centre, WNG and Mid-week plenary
* Prof. Francesco Restuccia, Northeastern University; WNG
* Emily Qi, Self, Editors

## Announcements (Slide 12)

* Attendance and reciprocal credit rules on Slide 12

## Timeline reminder (<https://www.ieee802.org/11/Reports/802.11_Timelines.htm>)

The 2nd Vice Chair reminds the subgroup chairs to update the timelines after THUR CAC. There are updates for several groups. The new TGbq row will be completed, once it has had it’s initial teleconference. Please check that there are no errors on the website.

## Social Event ([11-25/0002r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0002-00-0000-1st-vice-chair-report-2025-march-plenary-atlanta.pptx), slide 4-5)

Happens in Georgia Aquarium, Dinner will be provided.

* Buses will depart 6:00 p.m.
* Buses come back 7:30-9:30 p.m.
* You can also walk back and forth, if you like.

1. Liaison reports

## External liaisons

* + 1. Wi-Fi Alliance ([11-25/0215r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-00-0000-march-2025-session-report.pptx), slide 36-41)

The Asia member meeting has been held on Feb. 18-20 in Tokyo. It was a productive week with excellent guest speakers, networking opportunities, and task group sessions. There were notable keynote speeches, a showcase of the task groups, discussions on interoperability events’ ability to advance the Wi-Fi ecosystem, Demo of Wi-Fi CERTIFIED HaLoW offerings, documents available at https://groups.wi-fi.org/wg/Members/document/folder/3941 (available only for members). The next WFA F2F (Americas) member meeting will take place on June 10th – 12th, 2025, in Buenos Aires, Argentina.

Technical activity at WFA that has recently led to certification: Wi-Fi 7, QoS Management, EasyMesh, WPA3, Wi-Fi proximity ranging. Technical activity at WFA that is expected to lead to certification, Wi-Fi 7 R2, 6 GHz standard power, Wi-Fi Direct, XR (Augmented / Virtual / Mixed Reality), QoS Management. There is an increased use of interoperability events with commercial products after program launches.

Examples of additional WFA technical work (Slide 39): Security, Customer Experience, EasyConnect, Wi-Fi HaLow, Wi-Fi Data Elements, Wi-Fi Aware. Examples of additional WFA activity that may lead to technical work: Sensing, Automotive, Healthcare, Internet of things, Operators, Spectrum regulatory.

Recent publications (slide 40) and further information (slide 41).

* + 1. IETF Internet Engineering Task Force ([11-25/0215r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-00-0000-march-2025-session-report.pptx), slide 56-73)

Upcoming meetings next week March 15-21, 2025 in Bangkok, TH, next then before 802.11 meeting July 19-25, 2025 in Madrid. IETF meeting fee waivers seem to be available. This makes it free to attend.

Newcomer training: https://www.ietf.org/about/participate/get-started/ Joint meetings, agenda and presentation: http://www.iab.org/activities/joint-activities/iab-ieee-coordination/ , Proceedings: https://datatracker.ietf.org/iabasg/ietfieee/meetings/

Joint meetings, agenda and presentations: <http://www.iab.org/activities/joint-activities/iab-ieee-coordination/> Proceedings: <https://datatracker.ietf.org/iabasg/ietfieee/meetings/> Coordination topics include: Layer 2/Layer 3 Interaction for Time-Sensitive Traffic, Development of YANG models in the IEEE 802, Capability Discovery, MADINAS.

IETF-IEEE 802 coordination teleconferences: February 19, 2025, [RFC 9672](https://www.rfc-editor.org/info/rfc9672) (RFC 8110 to IEEE) has been published. IETF protocol use with 802.11 technology: RFC 9685 (Listener Subscription for IPv6 Neighbor Discovery Multicast and Anycast Addresses) has been published.

Birds-of-a-feather (BOF) groups at IETF 121, 2-8 Nov. 2024 (slide 61). IETF groups being (re-) chartered (slide 62). Yet Another Next Generation (YANG) model catalog (slide 63). IoT-related work: 6LO and Updates (slide 64), ROLL, CORE, IoT Directorate (slide 65).

Updates on working groups: MADINAS (MAC Address Device Identification for Network and Application Services WG, slide 66): To be published as RFC 9724: Randomized and Changing MAC Address State of Affairs: <https://datatracker.ietf.org/doc/draft-ietf-madinas-mac-address-randomization/> (March 2024). In RFC Editor’s queue: Randomized and Changing MAC Address Use Cases and Requirements: <https://datatracker.ietf.org/doc/draft-ietf-madinas-use-cases/> (December 2024). EAP (Extensible Authentication Protocol) Method Update (EMU, slide 67): Several updates. Operations Area Working Group (OPSA, slide 68): Several Updates. Internet Area Working Group (Slide 69): Revised: Communicating Proxy Configurations in Provisioning Domains: <https://datatracker.ietf.org/doc/draft-ietf-intarea-proxy-config/> (March 2025). Transport Layer Security (TLS) (slide 70): Several Updates. Deterministic Networking (DETNET, (slide 71): Revised and still in WGLC: Reliable and Available Wireless (RAW) Architecture: <https://datatracker.ietf.org/doc/draft-ietf-raw-architecture/> (February 2025), Revised and still in IESG evaluation: RAW Technologies: <https://datatracker.ietf.org/doc/draft-ietf-raw-technologies/> (February 2025). Autonomic Networking Integrated Model and Approach (ANIMA, slide 72): Several Updates.

* + 1. WBA Wireless Broadband Alliance ([11-25/0215r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-00-0000-march-2025-session-report.pptx), slide 42-55)

Introduction of WBA (Slide 43). WBA Technical Activities & Roadmap for 2025 (Slide 44): 5G/6G, IoT, NextGen, OpenRoaming, Roaming, Testing&Interoperability. Announcement of Wireless Global Congress Americas, Dallas, USA 19-22 May. [Presentations](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https:/wballiancec.wpenginepowered.com/wp-content/uploads/2025/01/WBA_WGC-ASIA-2025_PPT-FINAL_03.pdf) from last WGC APAC Jan 21-23 (Slide 45). [Linux Foundation Broadband & WBA Partners](https://wballiance.com/lf-broadband-partners-with-wireless-broadband-alliance-to-advance-open-source-and-standards-based-wireless-broadband-solutions/) (Slide 45). [WBA Innovation Forum](https://wballiance.com/lf-broadband-partners-with-wireless-broadband-alliance-to-advance-open-source-and-standards-based-wireless-broadband-solutions/) (Slide 47). [Enterprise Connectivity Forum](https://wballiance.com/lf-broadband-partners-with-wireless-broadband-alliance-to-advance-open-source-and-standards-based-wireless-broadband-solutions/) (Slide 48). [WBA Wi-Fi 7 Field Trials - CableLabs](https://wballiance.com/wi-fi-7-cablelabs-intel/) in residential areas (Slide 49). [Operator-Managed Smart Home Industry Framework](https://wballiance.com/smart-home-iot-framework/) (Slide 50). [L4S Implementation Guidelines](https://wballiance.com/implementation-guidelines-for-l4s/?utm_source=WBA+Newsletter&utm_campaign=6db8d57e5c-CAMPAIGN_l4s_mbr202502182_UO&utm_medium=email&utm_term=0_ca028c52f9-6db8d57e5c-440241309) (Slide 51).

## Internal (802) liaisons

* + 1. IEEE 802.19 Coexistence WG ([11-25/0475r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0475-01-0000-802-19-wg-march-2025-liaison-report.pptx))

Group reviews coexistence assessment documents (CADs) produced by working groups developing new wireless standards for unlicensed devices. Meeting slots: MON PM2, THUR PM3 (6:30 PM).

Current CADs: Letter Ballot for IEEE P802.15.4ab CAD started. If you are a voter of 802.19 WG, the link is <https://mentor.ieee.org/802.19/polls>.

FCC Consultation on Sub 1-GHz Bands: On 6 August 2024, the US FCC Wireless Telecommunications Bureau and Office of Engineering and Technology begins a consultation that seeks public comments on NextNav's petition to reconfigure the 902-928 MHz band and adopt new rules to enable the deployment of a 5G terrestrial positioning, navigation, and timing (PNT) network that “complements and backs up” the U.S. Global Positioning System (GPS). 802.19 WG will provide information to 802.18 WG to be included in IEEE 802 LMSC’s response.

802.19.3a Task Group: Scope: This amendment updates and expands coexistence recommendations to address new market requirements, increasing data traffic, greater device density of devices, and increased potential for congestion based on both IEEE Std 802.11-2020 and IEEE Std 802.15.4 sub-1 GHz standards. This amendment includes recommendations with respect to new devices, as well as compatibility with deployed legacy devices.

‘Follow up on measurement of radio noise over Sub-1 GHz band emitted from mini PC and laptop PC, and its impact on communication performance of IEEE 802.11ah’, Kazuto Yano (ATR), doc: [19-25/0012r0](https://mentor.ieee.org/802.19/dcn/25/19-25-0012-00-003a-follow-up-on-measurement-of-radio-noise-over-sub-1-ghz-band-emitted-from-mini-pc-and-laptop-pc-and-its-impact-on-communication-performance-of-ieee-802-11ah.pptx).

1. New Business

## P802.11bf conditional to RevCom; reaffirm CSD

**Approve document 11-25-0303r0 as the report to the IEEE 802 LMSC on the requirements for conditional approval to forward P802.11bf D8.0 to RevCom, and**

**Request the IEEE 802 LMSC to conditionally approve forwarding P802.11bf D8.0 to RevCom.**

Moved by Tony Xiao Han on behalf of TGbf, Second: San Kim

**Result: Yes: 133, No: 0, Abstain: 14**

**Motion passes.**

[TGbf: Moved: Claudio Da Silva, 2nd: Sang Kim, Result: 10/0/0]

**Re-affirm the P802.11bf CSD in https://mentor.ieee.org/802-ec/dcn/20/ec-20-0203-00-ACSD-p802-11bf.docx .**

Moved by Tony Xiao Han on behalf of TGbf, Second: Ian Sherlock

**Result: Yes: 150, No: xx, Abstain: 10**

**Motion passes.**

[TGbf: Moved: Claudio Da Silva, 2nd: Sang Kim, Result: 10/0/0]

## P802.11bk conditional to RevCom; reaffirm CSD

**Approve document 11-25-453r2 as the report to the IEEE 802 LMSC on the requirements for conditional approval to forward P802.11bk D5.0 to RevCom, and**

**request the IEEE 802 LMSC to conditionally approve forwarding P802.11bk D5.0 to RevCom and grant the WG chair editorial license.**

Moved by Jonathan Segev on behalf of TGbk, Second: Christian Berger

**Result: Yes: 138, No: 0, Abstain: 6**

**Motion passes.**

[TGbk: Moved: Ali Raissinia, 2nd: Roy Want, Result: 9/0/0]

**Confirm the CSD in https://mentor.ieee.org/802-ec/dcn/23/ec-23-0155-00-ACSD-p802-11bk.docx.**

Moved by Jonthan Segev on behalf of TGbk, Second: Ali Rassinia

**Result: Yes: 145, No: 0, Abstain: 13**

**Motion passes.**

[TGbk: Moved: Ali Raissinia, 2nd: Roy Want, Result: 7/0/0]

## P802.11br PAR & CSD

**Believing that the PAR contained in the document referenced below meets IEEE-SA guidelines,**

**request that the PAR contained in https://mentor.ieee.org/802.11/dcn/25/11-25-0185-01-0elc-draft-p802-11br-par.docx be posted to the IEEE 802 LMSC agenda for WG 802 preview and 802 LMSC approval to submit to NesCom.**

Moved by Volker Jungnickel on behalf of ELC SG, Second: Sovan Das

**Result: Yes: 133, No: 2, Abstain: 27**

**Motion passes.**

[ELC SG result: Moved: Stefan Videv, 2nd: Sovan Das, Result: 8/0/0]

**Believing that the CSD contained in the document referenced below meets IEEE-SA guidelines,**

**request that the CSD contained in https://mentor.ieee.org/802.11/dcn/24/11-24-1600-05-0elc-csd-proposal-for-elc.docx be posted to the IEEE 802 LMSC agenda for WG 802 preview and LMSC approval.**

Moved by Volker Jungnickel on behalf of ELC SG, Second: Matthias Wendt

**Result: Yes: 121, No: 1, Abstain: 33**

**Motion passes.**

[ELC SG result: Moved: Stefan Videv, 2nd: Sovan Das, Result: 8/0/0]

## Post-Quantum Crypto PAR SG ([11-25/0462r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0462-00-0000-post-quantum-crypto-project.pptx))

Today all of our public key crypto is based on two hard problems: Factoring large numbers,

Discrete logarithm problem. Our secure systems would become insecure if one (or both) of those were broken. A quantum computer, which does not exist yet, will be able to break both of these. Such a computer will exist in the (very near) future. In 802.11, public key crypto is used in AKM suites, but not in cipher suites. We need to plan today for a post-quantum future with 802.11 because it takes many years to deploy new technology in the field.

The MOSCA Theorem says that “There is a 1 in 7 chance that some fundamental public-key crypto will be broken by quantum by 2026, and a 1 in 2 chance of the same by 2031.” (by Dr. Michele Mosca, April 2015).

If encrypted data needs to be safe for X years; and, if it takes Y years to deploy a post-quantum solution; and, if a post-quantum computer will exist in Z years. Then, if (X + Y) > Z, you need to worry.

Post-Quantum crypto and IEEE 802.11: Currently there is no work in IEEE 802.11 to address this issue. There is active work in NIST as well as other organizations such as IETF.

Propose to start a project with the objective to update WLAN security to be resilient to a cryptographically relevant post-quantum computer. At a high level, the scope of the new project would cover: Updating or creating new AKMs to be more resilient to quantum computing. Looking into updates in other areas of IEEE 802.11 where public key cryptography is used (e.g. SAE, OWE, AP PeerKey, FILS, or PASN).

Slide 5 shows a Motion that will be made on Friday at the Closing Plenary.

## Post-Quantum Cryptography PAR ([11-25/0471r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0471-01-0000-pqc-draft-proposed-par.docx)) & CSD ([11-25/472r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0472-01-0000-pqc-draft-proposed-csd.docx)) proposals

CNTS requires that 802.11 takes action. We have heard from members that we should create a Task Group working on it. Bring up a Motion to create a study group for this topic.

Introduced the Scope 5.2.b. to add PQC algorithms.

Introduced Need for the Standard 5.5.: Deadlines move close to 2027. Enterprises have to work on it. It is an early stage, having everything approved in July to start in September.

Q: What are the exact requirements of this for Wi-Fi?

A: It will be in any equipment that is sold to the government. It will cover the whole infrastructure and has to comply.

Q: It is required for procurements. Authentication and handshake also apply to this.

A: My understanding is it only applies to data. PQ computer will break every secret. So we need an upgrade.

Q: Would be good to have a tutorial to educate the group what exactly is needed. Is this hardware or software. Without that, I have a hard time to judge this. It is kind of new.

A: Two presentations were made in WNG on that. The intention is to start working as soon as possible. A little bit more on discussion.

Chair: We will only do a study group formation motion on Friday, not yet create a project.

A: Create a PAR and give people the time to talk about this.

C: We expect software-only changes.

Chair: Expect to get something for WG approval in May, it will be considered for approval by the 802 LMSC in July. Then, we will have it on the next NesCom agenda.

Q: If this study group is approved, what action can be taken?

A: The study group can have telecons and start working.

## Remembering Bernard Aboba

Bernard was an exceptional contributor, particularly in 802.11i. He assisted with IETF and was one of the prolific authors. He was a very kind individual, open to help. He was someone to work with easily. It was always a pleasure to work with him. Thank you, Bernard, for your long contributions.

## AoB

1. Recess

Chair: We are now in recess.

Meeting recessed at 14:56 EST.

# IEEE 802.11 Closing Plenary, Friday, March 14th, 2025

1. Opening

## Call to order

The meeting was called to order at 8:02 EST time by the Chair, Robert Stacey (Intel).

## Officer and IEEE SA staff introduction

Chair: Robert Stacey Intel

1st Vice-chair (VC1): Jon Rosdahl Qualcomm

2nd Vice-chair (VC2): Stephen McCann Huawei Technologies Co., Ltd

Secretary: Volker Jungnickel Fraunhofer Heinrich Hertz Institute

IEEE SA Staff present: Christy Bahn, Fred J. Schindler

There were 74 people in the meeting (in the room, 8:26) 228 online and 293 recorded in the attendance tool (IMAT).

## Review and approve agenda (WG 11 agenda [11-26/0196r6](https://mentor.ieee.org/802.11/dcn/25/11-25-0196-06-0000-2025-march-wg11-agenda.xlsx))

Chair: There have been some minor changes to the agenda since the mid-week plenary.

**Approve the agenda for today’s meeting as shown in** [11-26/0196r6](https://mentor.ieee.org/802.11/dcn/25/11-25-0196-06-0000-2025-march-wg11-agenda.xlsx)**.**

Moved: Mark Hamilton. Second: Dan Harkins.

**No objection to approving by unanimous consent.**

1. **Announcements** (WG Chair’s Supplementary Material [11-25/0198r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0198-01-0000-2025-march-working-group-chair-supplementary-material.pptx))

## Policies and procedure reminder (slides 14-16)

The Chair went through participant behavior, code of ethics & conduct and IEEE Standards Boards bylaws and IEEE SA “Individual process”. Please, can you all remember these slides and understand that everyone is here as an individual subject matter expert.

## Call for Essential Patents (slide 17)

This is the Call for Essential Patents. No statements. No questions.

## Meeting Decorum (slide 18)

These are some rules for the meeting decorum. No questions.

## Next session and CAC meetings (slide 19)

The next session of the IEEE 802.11 working group will be from May 11-16 in the Warsaw Presidential Hotel, Warsaw, Poland. [Registration](https://touchpoint.eventsair.com/2025-may-ieee-802-wireless-interim-session) is open. It will be a mixed mode session.

Please be aware of the chair’s committee meetings (CAC), the first one of which will be on Monday 2025-04-07, then on Monday 2025-05-05, both at 09:00 ET. There is another one on Sunday 2025-05-11 at 18:00 Warsaw, Poland, immediately before the May session. Subgroup chairs, please note the deadline for the sub-group agendas.

## Announcements (slide 20)

Chair: Individual experts this time:

* Prof. Alphan Sahin, University of South Carolina, AIML
* Alex Lungu, Samsung Cambridge Solution Centre, WNG and Mid-week plenary
* Prof. Francesco Restuccia, Northeastern Univ, WNG
* Emily Qi, Self, Editors

## Reminder to get minutes to WG secretary

Secretary: Please can all sub-group chairs remember that their minutes should be posted to the server within 30 days of the completion of this session. No questions.

## Letters of Assurance (LoA) received (slide 21)

There is a link to the PatCom list of LoAs. 2 LoAs have been requested. The recent status can be found in [11-15/1489r23](https://mentor.ieee.org/802.11/dcn/15/11-15-1489-23-0000-register-of-loa-requests.docx). Recent changes are indicated on slide 21. No questions.

## Drafts for sale in IEEE Shop (slide 22)

This is the current list of items available in the IEEE store, what drafts are in the members area and published by 802 and ISO (checked on 2025-01-11).

## Drafts to liaise with ISO/JTC/SC6 (slide 23)

Published 2022 July: IEEE Std 802.11-2020 as ISO/IEC/IEEE 8802-11:2022

Since 2021, 14 drafts have been submitted, but all are currently stalled due to IPR concerns.

Drafts are sent to JTC1/SC6 during SA ballot to solicit comments. Approved drafts may also be sent during working group ballot. Any comments received from ISO are processed by the comment resolution committee. All drafts are liaised subject to LMSC approval.

## Press release status (slide 24)

In March 2025, there was an IEEE Computer Society Webinar on Advancing Wi-Fi Technology. It goes to the digital library and will then be available to everyone.

## IEEE 802 Public Visibility Standing Committee (slide 25)

Scope: The group is designed to raise industry awareness in a timely fashion of IEEE 802 WG/TAG activities. Develop social media content. LinkedIn – <https://www.linkedin.com/company/ieee802>. IEEE-SA 802 - <https://standards.ieee.org/featured/802/index.html>.

Content: Review Pre 802 Plenary sessions for social media messaging: PARs to be considered, Tutorials, [802.3] Call-for-Interests. New Task Force formations. Review Post 802 Plenary sessions for social media messaging: Study Group formations, IEEE 802 Position Approvals. Other 802 related material for social media: Press Releases, White Paper publications, Other 802 approved news, 802 WG / TAG Activities with IEEE-SA. IEEE-SA Standards Board Related - PAR Approvals, Standards Approval, Standards Publication.

LinkedIn Report: 5,006 total followers. Last 365 days: 73258 Impressions, 1539 Reactions. Latest Posts: 802.11 Webinar. March session. WG reports.

Notification of IEEE SA Standards Awards Nominations: The nomination period is now open and will run until 31 July 2025.

## Wireless Chairs meeting

The wireless chairs meeting makes decisions related to the operation of the wireless interim sessions, such as location and cost. The meeting is open to all. If you are interested in these topics, please attend. The wireless chairs meeting at 4:00pm local time on the Sunday of 802 Plenary and Wireless Interim in-person sessions and, as scheduled, via teleconference for electronic sessions. Upcoming telecons: Wednesday April 9, 2025, 3PM ET. Call details will be posted here: <http://ieee802.org/802tele_calendar.html>.

## Next sessions

May 11-16, 2025, Warsaw Presidential Hotel, Warsaw, Poland. July 27-Aug 1, Melia Castilla Madrid, Madrid, Spain. These sessions will count towards voting rights. Paid registration is required. For session information and registration links, see <http://www.ieee802.org/11/Meetings/Meeting_Plan.html>

1. Closing reports

## Working group reports

* + 1. Treasurers report ([ec-25/0001r1](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0001-01-WCSG-wireless-treasurer-report-2025.pptx))

As of March 1, $861k are in reserves. Overview for the year 2025. Have not booked Kobe session into this. There are final discussions which should be clarified at the end of next week. Net $83,671 (slide 4). January registration report (Slide 6): 683 people registered, 419 of which in person. 60 people came for the first time. There was one deadbeat (Slide 8). Asia-Pacific 50%, Americas 37%, Europe 12% (Slide 9).

Preview to May: We need budgeted 600 to register, so far 120 (Slide 10). The registration activity is lower than in Kobe, Japan (slide 11). Net session values. Pretty good for 2024 (Slide 12). Session fees for future sessions will not change during the 2025 sessions (slide 12). There is a 3-night stay discount of $300 for May and September interims. Deadbeats (Slides 14-18). Historic attendance, numbers are growing since the pandemic. Number of in-person is most impressive. Dramatic jump for the session in Japan. Might become tight at some of our booked future venues.

No questions.

* + 1. Straw Polls regarding sessions ([11-25/0217r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0217-04-0000-march-2025-working-group-motions.pptx), slides 11-12)

Only people present in the room were asked to participate in the following straw polls. These will be compiled into a statistics for all events, hopefully in 2025.

1. How many people would like to come back to this venue? 9Y / 36N
2. Did you go to the social? 48Y / 4N
3. If you attended the social, did you enjoy it? 42Y / 1N
   * 1. Future Venues Insight ([ec-25-0002r1](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0002-01-WCSG-wireless-venue-manager-report-2025.pptx))

Slides 3-4 show the status of the future plenary and interim venues as of March 9, 2025. 3 contracts are finished. 3 contracts are negotiated. There was a change in the venue for March from Prague to Warsaw.

Session venue manager explained upon request from the LMSC Chair the rules how he operates (Slide 5). The rules are from the operations manual (Slide 6). If you or someone you know would be interested in taking an active part in this role in the future, please get in contact with the Venue Manager.

The current selection guidance for venues is that one of the 3 sessions has to be a Non-US/Non-NA Location with Asia in even years. For the year 2025, we have one US/NA, one Europe, and one Asia venue which is contrary to this guidance.

Straw poll ([11-25/0217r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0217-04-0000-march-2025-working-group-motions.pptx), slides 11-12)

Would you prefer the IEEE 802 LMSC move to target venue locations as “1-1-1” (1 US/NA, 1 APAC, 1 Europe), or retain the current direction (2 US/NA -1 APAC/Europe)?

A) 1-1-1

B) 1 Non-US/NA per year alternating between Asia and Europe.

Result: 1-1-1 (A): 120, old rule (B): 42

Discussion (before running the SP):

C: Understand this question. Besides Europe, there are also other countries. At the Friday Plenary, we have much less people. Not representative for the whole group (currently 216 people online).

C: We had this question 3-4 years ago. It is not new. I am in favor of option 1, because we are international organization. But take care for treasury. We have to avoid penalties and keep existing and Corona contracts. Quite a lot of Asian participants during Kobe, should be no problem.

C: In favor a 1-1-1 because there are few European participants. Countries in the Gulf area might even sponsor us.

A: That a specific place is not listed does not mean it has not been considered. After initial bids, the choice is limited. There are natural limits to hotel prices. If you believe you can negotiate this, please come to me.

Q: What about sessions in Hawaii?

A: Back in around 2012, the idea was to go north-south-west, and always one to go to Hawaii. 802 LMSC made a rule change that we shall have one North American session and we will alternate between Europe and Asia. A predecessor chose Hawaii as North-American, which is not true. I will do my best to move things around. More than happy to sit down with Wireless Chairs. There were many straw polls to confirm the decisions made.

C: Strongly advertise 1-1-1. Proven to be a challenge to find venues. The current venue manager (Jon Rosdahl) is doing a good job. There are many constraints. Keep your expectations reasonable.

A (Chair): Note that that rule is guidance.

* + 1. Timelines (<https://www.ieee802.org/11/Reports/802.11_Timelines.htm>)

2nd Vice Chair: There are not many changes.

* + 1. Attendance report ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slide 3-8)

Clear uptrend in membership (voting members only) reaching 630. Quite a number of potential voters might become voters, at the next Plenary.

Discussion:

C: Could you, please, add when the statistics were taken.

A: This was following the previous Plenary session.

There is a breakdown by affiliation, by subgroup and breakout. Attendance by Subgroup between January and March. Attendance by break-out in March. Over 500 people attended the Opening plenary. Percentage of in-person vs. remote (some data are missing) shows a clear uptrend since Jan. 2024. Attendance by number of sessions attended. If an individual attended only 1, 2... sessions, how did he attend (how often in-person or remote). Few people do not attempt to become voters.

* + 1. Editors report ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 9-16)

Held one meeting slot. Meeting report in [11-25/0456r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0456-01-0000-march-2025-editors-meeting.pptx).

Editor contacts (Slide 10). Roundtable status report (Slide 11). Amendment order and page count as discussed in March (Slide 12). Dates are editor’s view, may not be consistent with timeline. Draft development snapshot (Slide 13). Publication process and review committee members (Slide 14). 802.11-2024 Revision Publication Review (Slide 15). ANA managed number space (Slide 16).

## Standing committee reports

* + 1. AIML Artificial Intelligence Machine Learning SC ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 17-18)

Agenda: [11-25/0188r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0188-00-aiml-aiml-sc-march-2025-atlanta-plenary-agenda.pptx). One meeting slot. SP + Motions: [11-24/0765r4](https://mentor.ieee.org/802.11/dcn/24/11-24-0765-04-aiml-aiml-sc-motion-booklet.pptx). Minutes: [11-25/0606r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0606-00-aiml-aiml-sc-mar-2025-plenary-meeting-minutes.doc).

Achievements: Two technical presentations. Over-the-air federated learning. Quite interesting contribution.

Plans for March 2025: No Telco planned. Technical Presentations on results, exploration and feasibility for existing use cases, Additional AIML use cases, technical report drafts.

* + 1. ARC Architecture SC ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), slides 20-25)

Agenda [11-25/0222r5](https://mentor.ieee.org/802.11/dcn/25/11-25-0222-05-0arc-arc-sc-agenda-march-2025.pptx). Held two meeting slots. Minutes: [11-25/251r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0251-00-0arc-arc-sc-mixed-mode-minutes-march-2025-plenary.docx).

Continued discussion on the proposal for Annex G replacement: [11-23/0880r7](https://mentor.ieee.org/802.11/dcn/23/11-23-0880-07-0arc-revised-annex-g-containing-example-frame-exchange-sequences.docx), [11-25/0193r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0193-04-0arc-frame-exchange-sequence-and-fig-10-14.pptx), [11-25/0488r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0488-00-0arc-fes-concepts-and-straw-polls.pptx). There is misalignment among experts on key concepts: “Frame exchange sequence (FES)”: Relation to medium protection (NAV, etc.), definition and extent of an occurrence of wireless medium, relation to beamforming, sectorization, MU operation, etc. Straw Polls didn’t help. Especially tricky as MLO and TGbn concepts are now added. Continue discussion in May.

Reviewed [11-25/0150r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0150-04-0arc-initial-thoughts-on-arc-misc-802-topics.docx) discussion document: Agreed direction, ready for text proposals: EPD and LPD terms are going away – we need to update 802.11 to align. [MAC address ordering discussion](https://mentor.ieee.org/802.1/dcn/24/1-24-0034-00-Mntg-proposal-to-revise-bit-ordering-material-in-p802revc-d2-0.docx) and 802.11 assumptions. Review 802.1AC mapping from ISS to 802.11 MAC SAP interface. Remove 802.2/LLC terms?

Plans for May: 802.11’s “Portal”. Access Domains. 802.3 Multi-carrier fiber. DS as a bridge (small ‘b’). VLANs. Relation to security domains. GLK/non-GLK STAs (cf 11-08/0114r0).

Other topics: IEEE Std 802 revision and WBA L4S (no changes since Jan). Still pending: MLME-RESET, versus MLME-JOIN, MLME-START, MLME-SCAN and MLME-END-

No teleconferences. 2 meeting slots in May. Continue these topics.

## COEX Coexistence SC ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), slides 25-34)

Agenda in [11-25/0208r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0208-01-coex-coex-sc-agenda-march-2025.xlsx). One meeting slot. Minutes in [11-25/0473r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0473-00-coex-march-2025-minutes.docx).

Bluetooth SIG update (slide 27):

* Work on technical proposal for ETSI BRAN: Continued input to EN 303 687 addresses license-exempt 6GHz band. Proposed final parameters for LBT for clause 4. Ongoing: work on testing procedures for clause 5. Internal discussion on non-CBT-based channel access scheme. Review of Canada ISED’s upper 6GHz consultation. Further information on both work items to be reported in a subsequent status update.

ETSI BRAN Update to 802.11 (slides 28-30):

* EN 303 687 (Wireless Access System/Radio Local Area Network (WAS/RLAN) in the license-exempt 6 GHz band). EN 303 687 only active work item. Coexistence between Narrowband Frequency Hopping (NB FH) and wideband transmissions discussed focusing on Energy Detection Threshold levels, NB FH operation w/o LBT, and NB FH channelization. Client-to-Client communication (C2C) at Low Power Indoor (LPI) levels.
* Discussion of change in terminology: Version 1.1.1 defines: Load-Based Equipment (LBE) and Frame Based Equipment (FBE). In addition, the HS defines a device category denoted as Narrowband Frequency Hopping Equipment (NBE) with LBT. Potential new terminology: Channel access mechanisms to be called Frame-Based channel Access (FBA), Load Based channel Access (LBA), and Narrow-band frequency hopping channel access with Listen Before Talk (NBA-LBT). Term “equipment” to be limited to referring to physical instances that implement LBA, FBA, or NBA-LBT.
* Official Journal of the EU: Update of OJEU related to Radio Equipment Directive (RED). Published 2025-01-30. No updates relating to HS developed by TC BRAN. Next update might come as of March/April 2025. It might be that version 1.1.1 of HS EN 303 687 will be listed in the OJEU.

Technical discussions (slide 31):

* 802.15.4ab NB Status Update: Review of 11-25/0349. Recirculation of Draft 2.0 of 802.15.4ab ongoing. All NB channel access comments were rejected due to “lack of consensus”. An additional discussion in May is anticipated, to discuss the main concern, i.e., lack of a mandatory mechanism.
* 802.15.4ab CAD: Discussion of some work in .11 Coex and joint Coex/802.15.ab not referenced. Dot19 ballot is open. Closes 2025-03-25.

Plans for May (slide 32):

* Two dot11 Coex (only) slots. TUES PM1, WED PM2. One joint session with 802.15.4ab TUES PM3/EVE. Topics: Update on ETSI BRAN, Bluetooth SIG. Technical submissions.

No Telco.

* + 1. PAR Review SC ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slide 35)

Agenda: [11-25/0246r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0246-02-0PAR-par-review-sc-mtg-agenda-and-comment-slides-2025-atlanta.pptx). 2 meeting slots in March.

3 PARs and CSDs were considered on MON PM1. List: <https://ieee802.org/PARs.shtml>. Comments were posted to the EC reflector. Feedback from WGs was due on TUES. Feedback was reviewed on THURS AM2. Final report was sent out prior to the Closing 802 LMSC Plenary Meeting.

* + 1. WNG Wireless Next Generation ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 36-37)

Agenda in [11-25/0212r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0212-01-0wng-agenda-for-wng-sc-2025-march.pptx). One meeting slot. Minutes in [11-25/0463r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0463-00-0wng-wng-meeting-minutes-2025-march-atlanta-meeting.docx).

4 Presentations: “[Intrinsic vulnerabilities of the MIMO channel sounding procedure](https://mentor.ieee.org/802.11/dcn/25/11-25-0460-01-0wng-intrinsic-vulnerabilities-of-the-mimo-channel-sounding-procedure.pptx)”, Francesca Meneghello (University of Padova), “[Post-Quantum 802.11](https://mentor.ieee.org/802.11/dcn/24/11-24-1103-01-0wng-post-quantum-802-11.pptx)”, Dan Harkins (HPE), “[Post-Quantum Opportunistic Wireless Encryption (OWE)](https://mentor.ieee.org/802.11/dcn/25/11-25-0218-02-0wng-post-quantum-opportunistic-wireless-encryption-owe.pptx)”, Alex Lungu (Samsung), “[802.11 Support of VLANs](https://mentor.ieee.org/802.11/dcn/25/11-25-0420-02-0wng-802-11-vlan-support.pptx)”, Donald Eastlake (Independent)

Plans for May: Call for presentations in May will be sent out in April.

No motions in the SC, two straw polls. Support for ML-KEM for PQC: Y:66 / N:7 / A:8. Support for VLAN TIG: Y:28 / N:10 / A:85.

* + 1. JTC1 802 SC ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 38-43)

Agenda in [ec-25/0057r1](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0057-01-LMSC-opening-report-to-lmsc-from-ieee-802-jtc1-sc-in-mar-2025.pptx). One meeting slot.

IPR issue (slide 39): 802.11 has 14 drafts stalled in the PSDO process. IPR holding up PSDO process. Going forward, 802.11 will not be shown as in-process; some 802.15 and 802.19 standards have also not been advanced in the PSDO process. May want to try submitting these specs to see if they fare better. Next steps: Generate a letter to IEEE SA President expressing the impacts of ISO/IEC IPR impasse. Observe how IEEE 802.3 fares in the parallel ITU-T SG15 process.

Plans for May (slide 38): Execute PSDO process, to the extent possible. There are no current ballots open, but the following could go into ballot: IEEE 802.1DC (FDIS), IEEE 802.1ASdm (FDIS), IEEE 802.1ASdn (FDIS), IEEE 802.1Qdj (FDIS), IEEE 802.1Qdx (FDIS), IEEE 802.1Qdy (submitted for 60-day ballot), IEEE 802.3 (FDIS), IEEE 802.15.3 (FDIS), IEEE 802.15.7 (FDIS), and IEEE 802.15.4 (60-day ballot). Monitor ISO/IEC JTC 1/SC 6 activities. Review response to IEEE 802 LMSC chair’s letter from IEEE SA President, if any.

## Task Group reports

* + 1. TGmf 802.11 - Revision Project ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 41-44)

Agenda in [11-25/0219r3](https://mentor.ieee.org/802.11/dcn/25/11-25-0219-03-000m-revmf-agenda-march-2025-session.pptx). Two meeting slots. Motions in [11-25/1925r4](https://mentor.ieee.org/802.11/dcn/24/11-24-1925-04-000m-revmf-motions.pptx). Closing report in [11-25/0486r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0486-00-000m-revmf-closing-report-march-2025.pptx).

Considered contributions on modifications REVme D7.0. Accepted two documents with proposed changes. Discussed a contribution on PASN with MLO.

Plans for May: Telco on Monday April 28 at 10am ET for 2h. Three meeting slots for May. Objectives: Continue to discuss contributions on published REVme D7.0, P802.11bh D6.0, and P802.11be D7.0. Approve the creation of REVmf D1.0 and the initial letter ballot. Timeline is unchanged (Slide 47).

* + 1. TGbf - WLAN Sensing (SENS) ([11-25/0215r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-02-0000-march-2025-session-report.pptx), Slides 45-47)

Agenda in [11-25/0223r](https://mentor.ieee.org/802.11/dcn/25/11-25-0223-01-00bf-tgbf-meeting-agenda-2025-03-plenary.pptx)1. Held one meeting slot. Minutes in [11-25/0482r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0482-01-00bf-ieee-802-11bf-march-2025-plenary-meeting-minutes.docx).

Progress during March 2025 session: Delivered P802.11bf report to 802 LMSC on conditional approval to forward draft to RevCom. Passed TG motions: P802.11bf fourth recirculation SA ballot. TGbf CSD re-affirmation. P802.11bf conditional forward to REVcom. Prepared WG motions: TGbf CSD re-affirmation, P802.11bf conditional forward to REVcom.

Goals for next two months: Release IEEE802.11bf D8.0. Complete 4th SA Ballot recirc (D8.0). Timeline is unchanged.

* + 1. TGbi - Enhanced Data Privacy (EDP) ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx) , slides 48-50)

Agenda in [11-25/0225r7](https://mentor.ieee.org/802.11/dcn/25/11-25-0225-07-00bi-tgbi-march-plenary-agenda.pptx). TGbi had 4 meeting slots. Minutes in [11-25/0444r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0444-01-00bi-tgbi-minutes-for-march-2025-plenary-meeting.docx).

TGbi began working through resolutions for large number of comments, motioning 88 comment resolutions, with additional comment resolutions reviewed but not yet motioned.

There will be weekly teleconferences between now and the May interim session. Wednesday 10:00-12:00 EDT. Dates: March 26, April 2, 9, 23, 30. Timeline is unchanged. Possibly, it needs changes in May.

* + 1. TGbk - 320 MHz Positioning ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 51-57)

Agenda in [11-25/0232r3](https://mentor.ieee.org/802.11/dcn/25/11-25-0232-03-00bk-tgbk-march-meeting-agenda.pptx). 2 meeting slots. Motions in [11-23/0049r55](https://mentor.ieee.org/802.11/dcn/23/11-23-0049-55-00bk-tgbk-motion-compendium.pptx). Minutes in [11-25/0650r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0650-00-00bk-minutes-for-march-2025-plenary.docx).

Work completed during this session: Reviewed and resolved 21 CIDs completing response to 1st SA recirculation. Approved 2nd recirculation SA ballot. Approved report to LMSC requesting to forward P802.11bk to RevCom. Reaffirmed CSD.

Work expected towards May: Publish draft P802.11bk D5.0. Receive LMSC approval for conditional forwarding to RevCom. Complete response to 2nd SA recirculation of P802.11bk D5.0. Conduct comment resolution if needed.

Teleconferences: March 18th, April 8th, April 15th, 10:00 am PT/13:00 ET (2hrs).

* + 1. TGbn - Ultra High Reliability (UHR) ([1111-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 54-57)

Agenda is available in [11-25/0221r10](https://mentor.ieee.org/802.11/dcn/25/11-25-0221-10-00bn-tgbn-mar-2025-meeting-agenda.pptx). 11 meeting slots for PHY, MAC and joint group altogether. Motions in [11-25/0014r13](https://mentor.ieee.org/802.11/dcn/25/11-25-0014-13-00bn-tgbn-motions-list-part-2.pptx). TGbn PHY and MAC ad-hoc Minutes in [11-25/0501r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0501-00-00bn-minutes-for-802-11bn-phy-ad-hoc-in-march-2025-plenary-session.docx) and [11-25/0490r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0490-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-january-2025.docx), TGbn all minutes in [11-25/647r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0647-00-00bn-tgbn-march-2025-meeting-minutes.docx). Specification framework including Motions passed in March in [11-24/0209r13](https://mentor.ieee.org/802.11/dcn/25/11-25-0014-13-00bn-tgbn-motions-list-part-2.pptx).

Achievements in March: Discussed technical submissions covering a variety of topics and proposed draft texts (PDTs). Approved over 80 motions that added additional concepts to the TGbn SFD, and spec text to the latest TGbn draft. Instructed the TGbn Editor to create TGbn D0.2. Approved a TGbn MAC/PHY ad-hoc (mixed mode) meeting in Europe (location Espoo, Finland, Nokia Campus, Karakaari 7, 02610 Espoo, Finland, see email from TGbn Chair on April, 10) from 23-25 July 2025.

Goals for May: Resolve comments from CC50. Complete inclusion of PDTs to TGbn draft. Target approving delivery of TGbn D1.0.

Teleconferences (slide 56): March 27, April 3. 10, 17, 24, May **1\*** (Thursday) 10:00-12:00 ET, March 24, 31, April 7, 14, 21, 28 (Monday) 19:00-21:00 ET, **bold**: joint, otherwise: MAC/PHY, \*: Motions.

Timeline is unchanged (Slide 57). Met previous milestones. Next is D1.0 for May 2025.

* + 1. TGbp - Ambient Power Communications (AMP) ([11-25/0215r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-02-0000-march-2025-session-report.pptx), Slides 58-61)

Agenda in [11-24/0228r7](https://mentor.ieee.org/802.11/dcn/25/11-25-0228-07-00bp-tg-bp-meeting-agenda-for-mar-plenary-2025.pptx). 8 TGbp meeting slots during March. Minutes in [11-25/0447r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0447-00-00bp-2025-03-plenary-meeting-minutes.docx).

Achievements in March: Approved the updated SFD documents incorporating approved motions from January 2025. Totally 35 technical contributions were presented and discussed, on PHY/MAC solutions, Wireless Power Transfer and Security. Lots of technical Motions for SFD were approved. Consensus on waveform, coding/modulation, PPDU design, security, channel access, WPT design, etc. The TGbp timeline was updated with the D0.1 milestone postponed to Jul 2025 (see slide 60).

Goal of future TGbp work: Continue developing FRD and SFD based on consensus. PDT development based on approved SFD. Open technical discussion and prepare for PDT development.

4 teleconferences are planned after Mar plenary session. March 25, April 8, 22, May 6 (Tuesday), 10:00am, ET, 2 hours; Webex

* + 1. TGbq Integrated Millimeter Wave (IMMW) ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 66-68)

Agenda in [11-25/0205r6](https://mentor.ieee.org/802.11/dcn/25/11-25-0205-06-00bq-tgbq-agenda-2025-march-plenary.xlsx). 2 meeting slots held in March. Minutes in [11-25/0576r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0576-01-00bq-tgbq-april-2025-teleconference-call-meeting-minutes.docx).

Work completed in March: Editor appointment and Vice Chair elections. Discussed the proposed task group timeline. Discussed the proposed selection procedure for draft development. Reviewed technical contributions.

Objectives for May: Confirm the task group timeline. Confirm the selection procedure for draft development. Review and discuss technical contributions.

4 Telecons scheduled for contributions: TUES, 1, 8, 15, 22 April, 9:30am ET to 11:00am ET.

## PAR SG/TIG/AHG reports

* + 1. ELC SG – Enhanced Light Communication ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 69-72)

Agenda in [11-25/0347r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0347-02-0elc-march-2025-elc-agenda.pptx). Two meeting slots in March. Minutes in [11-25/0461r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0461-00-0elc-elc-2025-03-minutes.docx).

Achievements in March: ELC SG addressed all comments on the PAR and CSD received from 802.1, 802.3 and RevCom. The modified PAR (doc. [11-25/0185r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0185-02-0elc-draft-p802-11br-par.pdf)) and CSD (doc. [11-24/1600r5](https://mentor.ieee.org/802.11/dcn/24/11-24-1600-05-0elc-csd-proposal-for-elc.docx)) were reapproved.

Plan in May: Start to work as a task group. Timeline is unchanged (Slide 72).

3 meeting slots in May.

* + 1. AUTO TIG Automotive ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), Slides 73-75)

Agenda in [11-25/0213r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0213-00-auto-agenda-for-automotive-tig-2025-march.pptx). One meeting slot in March. Minutes in [11-25/0463r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0463-00-0wng-wng-meeting-minutes-2025-march-atlanta-meeting.docx).

Presentation of submissions: “[IEEE 802.11ai and IEEE 802.11bc for Automotive Use](https://mentor.ieee.org/802.11/dcn/25/11-25-0226-00-auto-ieee-802-11ai-and-ieee-802-11bc-for-automotive-use.pptx)”, Hitoshi Morioka (SRC Software), “[Hybrid MLD for Automotive](https://mentor.ieee.org/802.11/dcn/25/11-25-0308-00-auto-hybrid-mld-for-automotive.pptx)”, Federico Lovison (Cisco)

“[Automotive-TIG-Thoughts on PHY improvements](https://mentor.ieee.org/802.11/dcn/25/11-25-0293-00-auto-automotive-tig-thoughts-on-phy-improvements.potx)”, Azin Neishaboori (General Motors)

“[Proposed IEEE802.11 Automotive TIG Technical Report Text on Regional HD Map Updates use case](https://mentor.ieee.org/802.11/dcn/25/11-25-0323-00-auto-proposed-ieee802-11-automotive-tig-technical-report-text-on-regional-hd-map-updates-use-case.doc),” Jing Ma (Toyota).

Plans for May: Presentations on use cases and requirements and KPIs.

No motions or teleconferences.

## Liaison reports

## 3.5.1. 802.15 Liaison report (update in [11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), slides 70-85)

802.15 WG agenda: [15-25/0077r4](https://mentor.ieee.org/802.15/dcn/25/15-25-0077-04-0000-march-2025-802-15-agenda.xlsx) . Opening report: [15-25/0078r4](https://mentor.ieee.org/802.15/dcn/25/15-25-0078-04-0000-march-2025-802-15-opening-report.pptx)

Subgroups closing reports (Slide 4). 802.15 Overview (Slide 5).

802.15.4 Projects overview on 15.4ab/ac/ad/ae/me (Slides 6-12).

- 15.4ab (NG-UWB [15-25/0165r0](https://mentor.ieee.org/802.15/dcn/25/15-25-0165-00-04ab-tg4ab-closing-report.pptx)): Initial ballot complete, in comment resolution. 1471 comments received to be resolved.

- 15.4ac (Enhanced Privacy [15-25/0118r2](https://mentor.ieee.org/802.15/dcn/25/15-25-0118-02-04ac-march-opening-and-closing.pptx)) Randomized addresses, and exchanges that support session continuity. Finding a lot of pitfalls. Documents summarized this.

- 15.4ad (NG SUN PHYs [15-25/0116r1](https://mentor.ieee.org/802.15/dcn/25/15-25-0116-01-04ad-tg4ad-agenda-opening-and-closing-report-march-2025.pptx)): Pre-draft development, technical contributions and proposals.

- 15.4ae (Ascon encryption [15-25/0119r1](https://mentor.ieee.org/802.15/dcn/25/15-25-0119-01-04ae-march-opening-and-closing.pptx)): Very low power, low complexity: Reviewed comments NIST received. Created draft ready for letter ballot. Created test vectors. Start pre-letter ballot comment collection after March.

15.6ma (Revision on 15.6, [15-25/0151r1](https://mentor.ieee.org/802.15/dcn/25/15-25-0151-01-006a-tg15-6ma-closing-report-for-march-2025.pptx)): Draft in WGLB. Preparation for 2nd Recirc.

15.9a (KMP Transport [15-25/0117r2](https://mentor.ieee.org/802.15/dcn/25/15-25-0117-02-009a-march-opening-and-closing.pptx)). Complete pre-ballot comment resolution. Initiate WG ballot.

IG Access: Contributions on modified channel access building on suspendable CSMA-CA. Contribution on spectrum efficient group associate. Plan for May: Move forward with possible MAC enhancement project (802.15.4).

15.16t (Licensed Narrowband): Pre-submitted for REVCOM. Pending LMSC approval (14-March).

3.5.2. 802.24 Vertical Applications TAG Liaison report ([11-25/0215r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0215-04-0000-march-2025-session-report.pptx), slides 96-100)

802.24 Overview: Goal are vertical applications, particularly smart grid and IoT, with corresponding task groups 24.1 and 24.2. Two meeting slots TUES and WED PM2.

AFV (Alternative Fueled Vehicles) White Paper: Types of AFV sites: Residential, commercial vehicle depot, public transport site, long haul freight transportation, and public parking facilities. Communications requirements: data volume, resilience, reliability. Ancillary communication to vehicles (maps, firmware and software updates for vehicles, inventory tracking, logistics, media, etc.). Relate to the use of IEEE 802 technologies as the solution. [Output document](file://C:\Users\rjstacey\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\LFOKS8MX\24-24-0027-01-0000-proposed-an-extended-outline-for-adding-use-cases-of-integrated-charging-infrastructure-with-distributed-energy-resources-building-and-grid-level-energy-management-systems-in-clause-3—1). AFV Teleconference - 23 April 2025 at 3pm PT 6pm ET, 7am Korea (April 24).

IoT White Paper Discussion: Needs of IoT and IEEE 802 solutions to address them. “Internet” public vs private. OT network for highly secure, isolated networks. Embedded comments need more text. How to incorporate wired IoT – specifically Single Pair Ethernet. Add section 5 for Connectivity Technologies (needs review from WG experts). Actions from March 2025: Smart City / Utility section – Seeking Wi-Sun text for this. New section moved to conclusion: “7. Looking back at the Hype, and what has actually been delivered.” Fill in section on IoT with high reliability. Closing statement. [Current Draft](https://mentor.ieee.org/802.24/dcn/22/24-22-0011-07-IoTg-internet-of-things-white-paper.docx). Work on actions above, then create clean new version for 2025 after May.

Smart Grid White Paper: Update of first Smart Grid white paper to address latest amendments of 802.15.4 u, v, w, x, y, Rev-me, and new organization of documents to clarify UWB vs Narrowband. March 2025 Actions: Spectrum sharing. Retain or remove OneM2M? Review security section. Update on energy constrained, low power devices. Review and update Companion document. [Current draft](https://mentor.ieee.org/802.24/dcn/24/24-24-0014-04-sgtg-802-24-smart-grid-white-paper-2024-update.docx).

1. Motions (WG Motions [11-25/0217r4](https://mentor.ieee.org/802.11/dcn/25/11-25-0217-04-0000-march-2025-working-group-motions.pptx))

## Working Group Motions

None.

## Standing Committee Motions

## Task Group Motions

* + 1. TGbn ad-hoc

**Approve a TGbn MAC/PHY (mixed mode) ad-hoc meeting on 23 to 25 July 2025, in Europe for the purpose of TGbn comment resolution and consideration of document submissions.**

Moved by Alfred Asterjadhi on behalf of TGbn, Second: Gaurav Patwardhan

No discussion.

**Result: Unanimous consent.**

**Motion passes.**

[TGbn: Moved: Kumail Haider, Second: Rubayet Shafin, Result: 124Y, 7N, 44A]

* + 1. Confirm TGbq officers

**Confirm the following TGbq vice-chairs:**

**Rui Cao**

**Abhishek Patil**

**Sang Kim**

Moved by Edward Au on behalf of TGbq, Second: Tuncer Baykas

No discussion.

**Result:** **Unanimous consent**

**Motion passes.**

## Study Group / Technical Interest Group Motions

None.

1. New Businesses

## Establish Liaison with WAA

**The IEEE 802.11 working group approves establishing a statement liaison with the World WLAN Application Alliance (WAA). The rationale for establishing this liaison relationship is to regularly exchange information on current activities in the respective groups.**

Moved by Robert Stacey, Second: Bo Sun

No discussion.

**Result: Unanimous consent.**

**Motion passes.**

## Form Post-Quantum Cryptography PAR Study Group

**Request approval by the IEEE 802 LMSC to form an 802.11 Post-Quantum Cryptography (PQC) PAR Study Group to enhance WLAN security with post-quantum cryptography as described in** [**https://mentor.ieee.org/802.11/dcn/25/11-25-0462-02-0000-post-quantum-crypto-project.pptx**](https://mentor.ieee.org/802.11/dcn/25/11-25-0462-02-0000-post-quantum-crypto-project.pptx) **, with the intent of creating a PAR and CSD.**

Moved by Mike Montemurro, Second: Mark Hamilton

**Result: Yes: 109, No: 0, Abstain: 18**

**Motion passes.**

Discussion:

C: There were plans for teleconferences. Would be good to announce them.

A: 10 days in advance is common practice. Stephen Orr is the intended Chair. He will announce the teleconferences.

C: Would be good to know this as soon as possible.

A: During Covid, we had separate Motion for telcos. Meanwhile, they are in closing reports. We should have a slide showing the telco dates. I will remember the subgroup chairs to announce their telcos over the 802.11 reflector after the session has ended.

## Teleconference schedule

The teleconference schedule is on the 802.11 Working Group website <https://ieee802.org/11/>.

1. Closing formalities

## Wireless Chairs meeting ([11-25/0198r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0198-02-0000-2025-march-working-group-chair-supplementary-material.pptx) slide 26)

The wireless chairs meeting makes decisions related to the operation of the wireless interim sessions, such as location and cost.

The meeting is open to all. If you are interested in these topics, please attend at 4:00 p.m. local time on the Sunday of 802 Plenary and Wireless Interim in-person sessions. As scheduled via teleconference for electronic sessions.

Upcoming telecon: WED April 9, 2025, 3 p.m. ET. Call details will be posted here: <http://ieee802.org/802tele_calendar.html>.

## Next sessions reminder ([11-25/0198r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0198-02-0000-2025-march-working-group-chair-supplementary-material.pptx) slide 27)

Next Interim session is from May 11-16, 2025 in the Warsaw Presidential Hotel, Warsaw, Poland. The next 802 Plenary session is scheduled for July 27-Aug 1 in the Melia Castilla Madrid, Madrid, Spain. Note that these sessions will count towards your voting rights. Paid registration is required. For session information and registration links, see <http://www.ieee802.org/11/Meetings/Meeting_Plan.html>.

## Announcements

None.

## Adjourn

Having completed the agenda, the Chair announced the meeting adjourned at 9:53 EST time.

Annex A: Links to Minutes

This Annex contains references to all IEEE 802.11 SC/TG/SG & Ad Hoc Committee (AHC) minutes from this session. Please note that they are NOT subject to the approval of these minutes but are confirmed and approved by their individual group in the opening meeting at their next session.

|  |  |  |
| --- | --- | --- |
| WG |  | 11-25/0229r0 |
| TGmf | TG | [11-25/0470r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0470-00-000m-minutes-for-revmf-2025-march-plenary-atlanta.docx) |
| TGbf | TG | [11-25/0482r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0482-01-00bf-ieee-802-11bf-march-2025-plenary-meeting-minutes.docx) |
| TGbi | TG | [11-25/0444r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0444-01-00bi-tgbi-minutes-for-march-2025-plenary-meeting.docx) |
| TGbk | TG | [11-25/0650r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0650-00-00bk-minutes-for-march-2025-plenary.docx) |
| TGbn | TG | [11-25/0647r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0647-00-00bn-tgbn-march-2025-meeting-minutes.docx) |
| TGbp | TG | [11-25/0447r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0447-00-00bp-2025-03-plenary-meeting-minutes.docx) |
| TGbq | TG | [11-25/0499r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0499-01-00bq-tgbq-march-2025-plenary-meeting-minutes.docx) |
| AUTO | TIG | [11-25/0489r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0489-00-auto-minutes-2025-03-10-auto-tig-meeting-atlanta.docx) |
| ELC | SG | [11-25/0461r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0461-00-0elc-elc-2025-03-minutes.docx) |
| AIML | SC | [11-25/0606r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0606-00-aiml-aiml-sc-mar-2025-plenary-meeting-minutes.doc) |
| ARC | SC | [11-25/0251r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0251-00-0arc-arc-sc-mixed-mode-minutes-march-2025-plenary.docx) |
| COEX | SC | [11-25/0473r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0473-00-coex-march-2025-minutes.docx) |
| PAR | SC | [11-25/0246r2](https://mentor.ieee.org/802.11/dcn/25/11-25-0246-02-0PAR-par-review-sc-mtg-agenda-and-comment-slides-2025-atlanta.pptx) |
| WNG | SC | [11-25/0463r0](https://mentor.ieee.org/802.11/dcn/25/11-25-0463-00-0wng-wng-meeting-minutes-2025-march-atlanta-meeting.docx) |
| JTC 802 | SC | [ec-25/0070r1](https://mentor.ieee.org/802-ec/dcn/25/ec-25-0070-01-JTC1-minutes-of-mixed-mode-meeting-in-march-2025.docx) |
| ITU | AH | [none](https://mentor.ieee.org/802.11/dcn/24/11-24-1273-01-immw-immw-meeting-minutes-for-july.docx) |

# Annex B: Working Group Officers

**Working Group**

|  |  |  |
| --- | --- | --- |
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| Stephen McCann (Huawei Technologies Co., Ltd) | 2nd Vice Chair (Rules and reflectors) IEEE 802 (LMSC) EC delegate | [stephen.mccann@ieee.org](mailto:stephen.mccann@ieee.org) |
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| Carol Ansley  (Cox Communications) | ANA authority | [carol@ansley.com](mailto:carol@ansley.com) |

**Standing Committees**

|  |  |  |
| --- | --- | --- |
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| Mark Hamilton (Ruckus Wireless) | Architecture (ARC) Standing Committee Chair | +1 (303) 818-8472 [mark.hamilton2152@gmail.com](mailto:mark.hamilton2152@gmail.com) |
| Jon Rosdahl (Qualcomm) | Project Authorization Request (PAR) Standing Committee Chair | +1 (801) 492-4023 [jrosdahl@ieee.org](mailto:jrosdahl@ieee.org) |
| Marc Emmelmann (Self) | Coexistence (Coex) Standing Committee Chair | [marc.emmelmann@me.com](mailto:marc.emmelmann@me.com) |
| Xiaofei Wang  (InterDigital) | Artificial Intelligence/Machine Learning (AIML) | [Xiaofei.Wang@interdigital.com](mailto:Xiaofei.Wang@interdigital.com) |

**Task Groups**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Michael Montemurro (Huawei Technologies Co., Ltd) | TGmf Chair 802.11 revision project - P802.11REVmf | [montemurro.michael@gmail.com](mailto:montemurro.michael@gmail.com) |
| Tony Xiao Han  (Huawei Technologies Co., Ltd) | TGbf Chair  WLAN Sensing (SENS) | [tony.hanxiao@huawei.com](mailto:tony.hanxiao@huawei.com) |
| Carol Ansley  (Cox Communications) | TGbi Chair  Enhanced Data Privacy (EDP) | [carol@ansley.com](mailto:carol@ansley.com) |
| Jonathan Segev (Intel Corporation) | TGbk Chair  320 MHz Positioning (320P) | +972-54-2403587 [jonathan.segev@intel.com](mailto:jonathan.segev@intel.com) |
| Alfred Asterjadhi  (Qualcomm) | TGbn Chair  Ultra High Reliability (UHR) | aasterja@qti.qualcomm.com |
| Bo Sun  (Sanechips) | TGbp Chair  Ambient Power (AMP) | [sun.bo1@sanechips.com.cn](mailto:sun.bo1@sanechips.com.cn) |
| Edward Au  (Huawei Technologies Co., Ltd) | TGbq Chair  Integrated Millimeter Wave | [edward.ks.au@gmail.com](mailto:edward.ks.au@gmail.com) |
|  | | |

**Study Groups (SG), Topic Interest Groups (TIG)**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Nikola Serafimovski (pureLiFi) | Enhanced Light Communications (ELC) SG | [nikola.serafimovski@purelifi.com](mailto:nikola.serafimovski@purelifi.com) |
| Jim Lansford (FaraFir Consulting) | Automotive (AUTO) TIG | [jim.lamsford@ieee.org](mailto:jim.lamsford@ieee.org) |

**Ad-Hoc Groups (AHG)**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
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**Liaison Officials to non-IEEE 802 organizations**

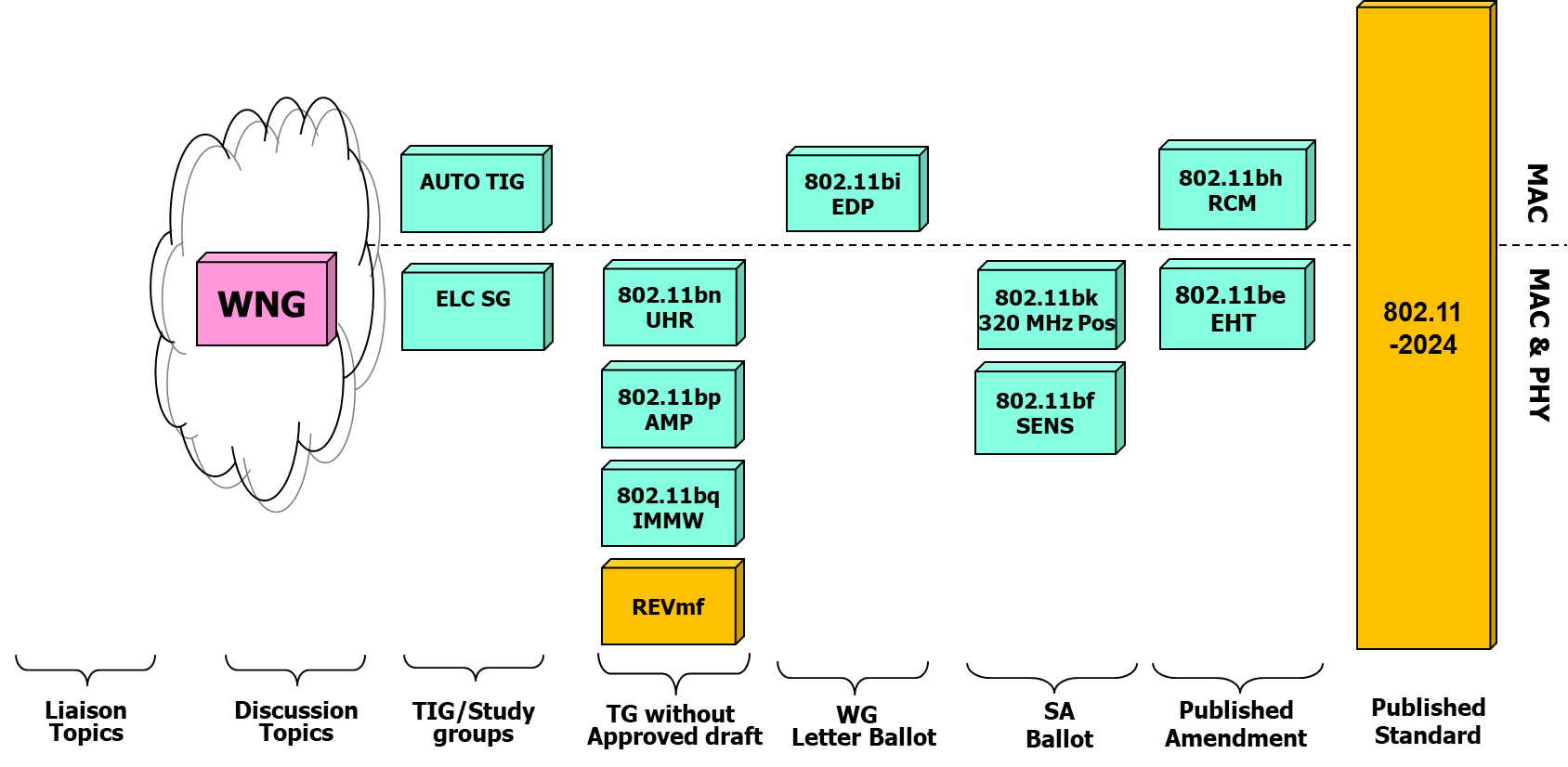
|  |  |  |
| --- | --- | --- |
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**Liaison Officials to IEEE organizations**

|  |  |  |
| --- | --- | --- |
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| Benjamin Rolfe (Blind Creek Associates) | Liaison to IEEE 802.15 | [ben.rolfe@ieee.org](mailto:ben.rolfe@ieee.org) |
| Edward Au  (Huawei Technologies Co., Ltd) | Liaison to IEEE 802.18 | [edward.ks.au@gmail.com](mailto:edward.ks.au@gmail.com) |
| Tuncer Baykas (Ofinno) | Liaison to IEEE 802.19 | [tbaykas@ieee.org](mailto:tbaykas@ieee.org) |

# Annex C: Revisions and Standards Pipeline



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# Annex D: Attendance & Affiliation

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Affiliation** | **Attended 75%** | **Status** |
| Abdelaal, Rana | Broadcom Corporation | Yes | Voter |
| Abeywickrama, Tharindu | Huawei Technologies Co., Ltd | Yes | Voter |
| AbidRabbu, Shaima' | VESTEL, IMU | Yes | Voter |
| Abouelseoud, Mohamed | Apple Inc | Yes | Voter |
| Aboulmagd, Osama | Huawei Technologies | Yes | Voter |
| Adachi, Tomoko | TOSHIBA Corporation | No | Voter |
| Adakeja, Olubukola | Teradyne, Inc. | Yes | Voter |
| Adhikari, Shubhodeep | Broadcom Corporation | Yes | Voter |
| Agarwal, Peyush | Broadcom Corporation | No | Voter |
| Agyapong, Jonathan Obeng | Hanbat National University | Yes | Potential Voter |
| Ahn, Woojin | KNUT | Yes | Voter |
| Aio, Kosuke | Sony Corporation | Yes | Voter |
| Akhmetov, Dmitry | Intel | Yes | Voter |
| Akwafo, Reynah | Hanbat National University | Yes | Potential Voter |
| Alagarsamy, Srividhya | Broadcom Corporation | No | Non-Voter |
| Alcantara, Carlos | Cisco Systems, Inc. | Yes | Potential Voter |
| Ali, Kamran | General Motors Company | Yes | Potential Voter |
| Amtmann, Franz | NXP Semiconductors | Yes | Voter |
| Anderson, Fred | Skyworks Solutions Inc. | yes | Non-Voter |
| Ansley, Carol | Cox Communications Inc. | yes | Voter |
| Anwyl, Gary | MediaTek Inc. | yes | Voter |
| Asai, Yusuke | NTT | yes | Voter |
| Asterjadhi, Alfred | Qualcomm Technologies, Inc | yes | Voter |
| Au, Kwok Shum | Huawei Technologies Co., Ltd | no | ExOfficio |
| Awater, Geert | Qualcomm Technologies Netherlands B.V. | yes | Voter |
| Aygul, Mehmet | Vestel | yes | Potential Voter |
| Baek, SunHee | LG ELECTRONICS | yes | Voter |
| Bahn, Christy | IEEE Staff | no | Non-Voter |
| Bai, Jiyang | TCL | yes | Potential Voter |
| Baik, Eugene | Qualcomm Incorporated | yes | Voter |
| Bajaj, Ian | Huawei International Pte. Ltd. | yes | Voter |
| Bajko, Gabor | MediaTek Inc. | yes | Voter |
| Balakrishnan, Hari Ram | NXP Semiconductors | yes | Voter |
| Banerjee, Subharthi | NXP Semiconductors | yes | Voter |
| Bang, Inkyu | Hanbat National University | yes | Aspirant |
| Bansal, Ankur | SAMSUNG ELECTRONICS | no | Non-Voter |
| Bansal, Priyanka | NXP Semiconductors | yes | Voter |
| Bao, Zhanjing | TCL | yes | Voter |
| baron, stephane | Canon Research Centre France | yes | Voter |
| Batra, Anuj | Apple, Inc. | yes | Voter |
| Baykas, Tuncer | Ofinno | yes | Voter |
| Ben Arie, Yaron | Toga Networks (A Huawei Company) | yes | Voter |
| Bethapudi, Shirly | NXP Semiconductors | yes | Voter |
| Bhandaru, Nehru | Broadcom Corporation | yes | Voter |
| Bhattacharya, Abhijit | Qualcomm Incorporated | yes | Voter |
| Bian, Tong | Panasonic Holdings Corporation | yes | Voter |
| Bims, Harry | Bims Laboratories, Inc. | no | Voter |
| Boldy, David | Broadcom Corporation | yes | Voter |
| Boodannavar, Veerendra | Apple Inc. | yes | Voter |
| Borges, Daniel | Apple, Inc. | yes | Voter |
| Bredewoud, Albert | Broadcom Corporation | yes | Voter |
| Busser, Ryan | Blue Halo | yes | Non-Voter |
| Byeon, Seongho | SAMSUNG ELECTRONICS | yes | Voter |
| Bykov, Denis | NXP Semiconductors | yes | Voter |
| Campiglio, Ugo | Cisco Systems, Inc. | yes | Voter |
| Canchi, Radhakrishna | Kyocera International Inc | no | Voter |
| Canpolat, Necati | Intel | yes | Voter |
| Cao, Bo | ZTE Corporation | yes | Voter |
| Cao, Rui | NXP Semiconductors | yes | Voter |
| Cariou, Laurent | Intel | yes | Voter |
| Carney, William | Sony Group Corporation | yes | Voter |
| Carty, Clark | Juniper Networks, Inc. | yes | Voter |
| Cavalcanti, Dave | Intel | yes | Voter |
| Cha, Dongju | LG ELECTRONICS | yes | Voter |
| Chan, Andy | Infineon Technologies | yes | Voter |
| Chang, Chen-Yi | MediaTek Inc. | yes | Voter |
| Chang, Yu Hsien | Mediatek | yes | Potential Voter |
| Chappell, Matthew | Cox Communications Inc. | yes | Non-Voter |
| Chaturvedi, Abhishek | Samsung Electronics | yes | Voter |
| Che, Hui | Ruijie Networks Co., Ltd | yes | Voter |
| Chen, Cheng | Intel | yes | Voter |
| CHEN, CHENG | pureLiFi Ltd. | yes | Voter |
| Chen, Cheng-Ming | Qualcomm Incorporated | no | Aspirant |
| Chen, Evelyn | Ericsson AB | yes | Voter |
| CHEN, JIANQIANG | ZTE Corporation | yes | Potential Voter |
| Chen, Jinzhu | General Motors Company | no | Non-Voter |
| Chen, Junbin | TP-Link Systems Inc. | yes | Voter |
| Chen, Wei-Han | MediaTek Inc. | yes | Potential Voter |
| Chen, Xiaogang | Spreadtrum Communication USA, Inc | yes | Voter |
| Chen, Xu | Xiaomi Communications Co., Ltd. | yes | Non-Voter |
| Chen, You-Wei | MediaTek Inc. | yes | Voter |
| Cheng, Nan | Xidian University | yes | Voter |
| Cheng, Paul | MediaTek Inc. | yes | Voter |
| cheng, phoebe | MediaTek Inc. | yes | Voter |
| Cheng, Xilin | NXP Semiconductors | yes | Voter |
| CHENG, yajun | Xiaomi Communications Co., Ltd. | yes | Potential Voter |
| CHERIAN, GEORGE | Qualcomm Incorporated | yes | Voter |
| Chisci, Giovanni | Qualcomm Technologies, Inc | yes | Voter |
| Chitrakar, Rojan | Huawei International Pte Ltd | no | Voter |
| Chiu, WenHsien | MediaTek Inc. | yes | Potential Voter |
| Cho, Hangyu | LG ELECTRONICS | yes | Voter |
| Choi, JinHo | SAMSUNG ELECTRONICS | yes | Voter |
| Choi, Jinsoo | LG ELECTRONICS | yes | Voter |
| Chou, Tzu-Hsuan | Qualcomm Incorporated | no | Voter |
| Chu, Liwen | NXP Semiconductors | yes | Voter |
| Chung, Bruce | Realtek Semiconductor Corp. | yes | Voter |
| Chung, Chulho | SAMSUNG | yes | Voter |
| Ciochina, Dana | Sony Corporation | yes | Voter |
| Coffey, John | Realtek Semiconductor Corp. | yes | Voter |
| Contreras Albesa, Javier | Cisco Systems, Inc. | yes | Voter |
| Costa, D.Nelson | HaiLa Technologies | yes | Voter |
| Cui, Yaoshen | TP-Link Systems Inc. | yes | Voter |
| da Silva, Claudio | Meta Platforms | no | Voter |
| Das, Dibakar | Intel Corporation | yes | Voter |
| Das, Sovan | Kyocera SLD Laser Inc | yes | Potential Voter |
| Das, Subir | Peraton Labs | yes | ExOfficio |
| Dauphinee, Leonard | MaxLinear Corp | yes | Voter |
| Davis, Mike | Nordic Semiconductor ASA | yes | Voter |
| de Vegt, Rolf | Qualcomm Incorporated | yes | Voter |
| DeLaOlivaDelgado, Antonio | InterDigital, Inc. | yes | Voter |
| Derham, Thomas | Broadcom Corporation | yes | Voter |
| Desai, Prasanna | Intel Corporation | yes | Potential Voter |
| Deshmukh, Mrugen | Ofinno | yes | Voter |
| Dezfouli, Behnam | Nokia | yes | Voter |
| Dharap, Anuj | Cisco Systems, Inc. | yes | Non-Voter |
| Di Taranto, Rocco | Ericsson AB | yes | Voter |
| Dinan, Esmail | Ofinno | yes | Voter |
| Ding, Qian | TP-Link Systems Inc. | yes | Non-Voter |
| Dong, Xiandong | Xiaomi Communications Co., Ltd. | yes | Voter |
| Doppler, Klaus | Nokia | yes | Voter |
| Du, Zhenguo | Huawei Technologies Co., Ltd | yes | Voter |
| Dumdei, Alan | Cisco Systems | yes | Potential Voter |
| Dunna, Manideep | Qualcomm | no | Voter |
| Eastlake 3rd, Donald | Self | yes | Potential Voter |
| Eiger, Martin | Peraton Labs | yes | Voter |
| Ekkundi, Manasi | SAMSUNG ELECTRONICS | yes | Voter |
| ElSherif, Ahmed | Qualcomm Incorporated | no | Voter |
| EMMELMANN, MARC | Self | yes | Voter |
| Epstein, Avner | MaxLinear | yes | Non-Voter |
| Erceg, Vinko | Broadcom Corporation | yes | Voter |
| Erkucuk, Serhat | Ofinno | yes | Voter |
| Fan, Shuang | Sanechips Technology Co., Ltd. | yes | Voter |
| Fang, Juan | Intel Corporation | yes | Voter |
| Fang, Yonggang | MediaTek Inc. | yes | Voter |
| Fazel, Fatemeh | Intel | yes | Potential Voter |
| feng, Shuling | MediaTek Inc. | yes | Voter |
| Ficara, Domenico | Cisco Systems, Inc. | yes | Voter |
| Fischer, Matthew | Broadcom Corporation | yes | Voter |
| Fletcher, Paul | Samsung Cambridge Solution Center | yes | Potential Voter |
| Friedl, Stephan | Cisco Systems, Inc. | yes | Potential Voter |
| Fu, Qingwei | TP-Link Systems Inc. | yes | Voter |
| Gan, Ming | Huawei Technologies Co., Ltd | yes | Voter |
| Gangur, Trivikram | Infineon Technologies | yes | Voter |
| Ganji, Mehdi | Charter Communications | yes | Voter |
| Ganotra, Shivesh | Cisco Systems, Inc. | yes | Voter |
| Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |
| Garg, Lalit | Broadcom Corporation | yes | Voter |
| Genc, Eda | Nokia | yes | Potential Voter |
| Georgiev, Zahari | Cisco Systems | yes | Potential Voter |
| Ghaderipoor, Alireza | MediaTek Inc. | yes | Voter |
| Ghosh, Chittabrata | Apple Inc | yes | Voter |
| Gidvani, Ravi | SAMSUNG ELECTRONICS | yes | Voter |
| Gilb, James | General Atomics Aeronautical Systems, Inc. | no | ExOfficio |
| Godfrey, Tim | Electric Power Research Institute, Inc. (EPRI) | no | ExOfficio |
| Gong, Bo | Huawei Technologies Co., Ltd | yes | Voter |
| Goto, Fumihide | DENSO | yes | Voter |
| Grandhe, Niranjan | NXP Semiconductors | yes | Voter |
| Grigat, Michael | Deutsche Telekom AG | yes | Voter |
| Grover, Jatin | Cisco Systems, Inc. | yes | Voter |
| Gu, Jaheon | Samsung Electronics Co., Ltd. | yes | Voter |
| Gu, Junrong | Clourney Semiconductor | yes | Voter |
| Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. | yes | Voter |
| GUIGNARD, Romain | Canon Research Centre France | yes | Voter |
| Gulati, Kapil | NXP Semiconductors | no | Potential Voter |
| Guo, Jing | NXP Semiconductors | yes | Voter |
| Guo, Yuchen | Huawei Technologies Co., Ltd | yes | Voter |
| Guo, Zheng | NXP Semiconductors | yes | Voter |
| Guo, Ziyang | Huawei Technologies Co., Ltd | no | Voter |
| Gupta, Ankit | NXP Semiconductor | yes | Voter |
| Gupta, Binita | Cisco Systems, Inc. | yes | Voter |
| gutierrez, luis | Broadcom Corporation | yes | Voter |
| Ha, Taeyoung | Samsung Electronics Co., Ltd. | no | Voter |
| Haider, Muhammad Kumail | Meta Platforms Inc. | yes | Voter |
| Halasz, David | Morse Micro | yes | Voter |
| Halna du Fretay, Tristan | Canon Research Centre France | yes | Non-Voter |
| Hamilton, Mark | Ruckus/CommScope | yes | Voter |
| HAN, DONG | Apple Inc | no | Voter |
| HAN, Xiao | Huawei Technologies Co., Ltd | yes | Voter |
| Handte, Thomas | Sony Group Corporation | yes | Voter |
| Hansen, Christopher | Covariant Corporation | yes | Voter |
| Harkins, Daniel | Aruba Networks, Inc. | yes | Voter |
| Hart, Brian | Cisco Systems, Inc. | yes | Voter |
| Hasabelnaby, Mahmoud | Huawei Technologies Canada; Huawei Technologies Co., Ltd | yes | Voter |
| Hawkes, Philip | Qualcomm Incorporated | no | Non-Voter |
| He, Chuanfeng | Beijing OPPO telecommunications corp., ltd; Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |
| He, Linhai | Qualcomm Incorporated | yes | Voter |
| Hedayat, Ahmadreza | Apple Inc | yes | Voter |
| Helmy, Ahmed | Apple Inc | no | Voter |
| Helwa, Sherief | Qualcomm Technologies, Inc | yes | Voter |
| Henry, Jerome | Cisco Systems, Inc. | yes | Voter |
| Hernandez, Marco | National Institute of Information and Communications Technology (NICT) | no | Aspirant |
| Herndon, John | Cisco Systems, Inc. | no | Non-Voter |
| Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) | yes | Voter |
| Hiertz, Guido | Ericsson GmbH | yes | Voter |
| Hirata, Ryuichi | Sony Corporation | yes | Voter |
| Ho, Duncan | Qualcomm Technologies, Inc | yes | Voter |
| Hou, Justin | TP-Link Systems Inc. | yes | Non-Voter |
| Hsiao, Ching-Wen | MediaTek Inc. | yes | Voter |
| Hsieh, Hung-Tao | MediaTek Inc. | yes | Voter |
| Hsu, Chien-Fang | MediaTek Inc. | yes | Voter |
| Hsu, Ostrovsky | Xiaomi Communications Co., Ltd. | yes | Voter |
| Hsu, Yungping | MediaTek Inc. | yes | Voter |
| Hu, Chunyu | Spreadtrum Communications USA | no | Voter |
| Hu, Mengshi | Huawei Technologies Co., Ltd | yes | Voter |
| Hu, Shengquan | MediaTek Inc. | yes | Voter |
| HUANG, CHIHAN | MediaTek Inc. | yes | Voter |
| Huang, Chun | ZTE corporation | yes | Potential Voter |
| Huang, Guogang | Huawei Technologies Co., Ltd | yes | Voter |
| huang, kaikai | Nokia | yes | Voter |
| Huang, Lei | Huawei International Pte Ltd | yes | Voter |
| Huang, Po-Kai | Intel | yes | Voter |
| Huang, Qisheng | ZTE Corporation | yes | Voter |
| Hunt, Preston | Intel | yes | Potential Voter |
| Hussein, Abdalla | Huawei Technologies Co., Ltd | yes | Aspirant |
| Inoue, Kyosuke | SHARP CORPORATION | yes | Voter |
| Islim, Mohamed Sufyan | pureLiFi | yes | Voter |
| Jang, Insun | LG ELECTRONICS | yes | Voter |
| Jee, Anand | SAMSUNG ELECTRONICS | yes | Voter |
| Jeffries, Timothy | Futurewei Technologies | yes | Voter |
| Jeon, Eunsung | SAMSUNG ELECTRONICS | yes | Voter |
| Ji, Chenhe | Huawei Technologies Co., Ltd | yes | Voter |
| jiang, feng | Apple Inc | no | Voter |
| Jiang, Jinjing | Apple, Inc. | no | Voter |
| Jiang, Yi | ZTE Corporation | yes | Aspirant |
| Jiang, Zhiping | Xidian University | yes | Voter |
| Joh, Hanjin | KT Corp. | no | Voter |
| John, Toby | Verizon | no | Voter |
| Johnsson, Kerstin | Nokia | yes | Potential Voter |
| JOO-HYUN, PARK | SAMSUNG ELECTRONICS | yes | Non-Voter |
| Jung, Insik | LG ELECTRONICS | yes | Potential Voter |
| Jungnickel, Volker | Fraunhofer Heinrich Hertz Institute | no | Voter |
| Kadampot, Ishaque Ashar | Qualcomm Technologies, Inc. | yes | Voter |
| Kain, Carl | Noblis, Inc.; USDoT | yes | Voter |
| Kakani, Naveen | Qualcomm Incorporated | yes | Voter |
| Kalamkar, Sanket | Qualcomm Technologies, Inc | yes | Voter |
| Kalyankar, Shravan | Huawei Technologies Co., Ltd | yes | Aspirant |
| kamath, Manoj | Broadcom Corporation | yes | Voter |
| Kamel, Mahmoud | InterDigital, Inc. | yes | Voter |
| Kamendje, Guy | HaiLa Technologies Inc. | no | Non-Voter |
| Kandala, Srinivas | SAMSUNG | yes | Voter |
| Kang, HaoHua | MediaTek Inc. | yes | Voter |
| KANNI, PRAMOD | Synaptics | yes | Non-Voter |
| Karmakar, Anirban | Cisco Systems, Inc. | yes | Non-Voter |
| Karmuchi, Shailender | SAMSUNG ELECTRONICS | yes | Voter |
| Karthik, S. G. | SAMSUNG ELECTRONICS | yes | Voter |
| Kasargod, Sudhir | Infineon Technologies | yes | Voter |
| Ke, Wang | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Aspirant |
| Kennedy, Richard | Bluetooth SIG | no | Voter |
| Kenney, John | Toyota Motor North America | yes | Voter |
| Keren, Rani | Huawei Technologies Co., Ltd | yes | Potential Voter |
| KERGOURLAY, Gerald | Canon Research Centre France | yes | Non-Voter |
| Kim, chan woo | Cisco systems | yes | Potential Voter |
| Kim, Geon Hwan | LG ELECTRONICS | yes | Voter |
| Kim, Hyungjin | Broadcom Corporation | yes | Voter |
| Kim, Jeongki | Ofinno | yes | Voter |
| Kim, Jungjun | Samsung Electronics | yes | Voter |
| Kim, Kunju | Hanbat National University | no | Aspirant |
| Kim, Myeong-Jin | SAMSUNG | yes | Voter |
| Kim, Sang Gook | LG ELECTRONICS | yes | Voter |
| Kim, Sanghyun | WILUS Inc. | yes | Voter |
| Kim, Seonghyun | Hanbat National University | yes | Potential Voter |
| Kim, Suhwook | Samsung Electronics | yes | Voter |
| Kim, Taehoon | Hanbat National University | yes | Potential Voter |
| Kim, Yongho | Korea National University of Transportation | yes | Voter |
| Kim, Youhan | Qualcomm Technologies, Inc. | no | Voter |
| Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) | yes | Voter |
| Kitazawa, Shoichi | Muroran IT | yes | Voter |
| Klein, Arik | Huawei Technologies Co., Ltd | yes | Voter |
| Kneckt, Jarkko | Apple, Inc. | yes | Voter |
| Kochuparambil, Elizabeth |  | no | Non-Voter |
| Koo, Jonghoe | SAMSUNG ELECTRONICS | yes | Voter |
| Krebs, Alexander | Apple Inc | yes | Voter |
| Krieger, Ann | US Department of Defense | no | Non-Voter |
| Krischer, Mark | Cisco Systems, Inc. | yes | Aspirant |
| Krishnan, Suresh | Cisco Systems, Inc. | no | Non-Voter |
| Ku, Chung-Ta | MediaTek Inc | yes | Voter |
| Kumar, Manish | NXP Semiconductors | no | Voter |
| Kumbhkar, Ratnesh | Intel Corporation | no | Voter |
| Kuo, Chih-Chun | MediaTek Inc. | yes | Voter |
| Kwak, Jin-Sam | WILUS Inc. | yes | Non-Voter |
| Kwakye, Emmanuel | Hanbat National University | yes | Aspirant |
| Lan, Zhou | Apple Inc. | yes | Voter |
| Lanante, Leonardo | Ofinno | yes | Voter |
| Lansford, James | farafir, SRL | no | Voter |
| Lee, Gwangho | Korea National University of Transportation | yes | Voter |
| Lee, Hong Won | LG ELECTRONICS | yes | Voter |
| Lee, Jack | SAMSUNG ELECTRONICS | yes | Voter |
| Lee, Jihye | Samsung Electronics Co., Ltd. | yes | Aspirant |
| LEE, JOONSOO | Newracom Inc. | no | Voter |
| Lee, Ju Hyung | Nokia | yes | Potential Voter |
| Lee, Kyoung-Jae | Hanbat National University | yes | Potential Voter |
| Lee, Wookbong | Apple Inc | yes | Voter |
| Levy, Joseph | InterDigital, Inc. | yes | Voter |
| Li, Bo | Northwestern Polytechnical University | yes | Voter |
| Li, Haozheng | TP-Link System Inc. | yes | Voter |
| Li, Jialing | Qualcomm Technologies, Inc | no | Voter |
| Li, Panpan | Huawei Technologies Co., Ltd | yes | Voter |
| Li, Qinghua | Intel | yes | Voter |
| Li, Weiyi | Spreadtrum Communication USA, Inc | yes | Voter |
| Li, Xin | Huawei Technologies Co., Ltd | yes | Voter |
| Li, Yan | ZTE Corporation | yes | Voter |
| Li, Yanchun | Huawei Technologies Co., Ltd | yes | Voter |
| Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |
| li, yun | ZTE Corporation | yes | Voter |
| Li, Yunbo | Huawei Technologies Co., Ltd | yes | Voter |
| Lim, Dong Guk | LG ELECTRONICS | yes | Voter |
| Lin, Wei | Xiaomi Communications Co., Ltd. | yes | Voter |
| LIU, CHENCHEN | Huawei Technologies Co., Ltd | no | Voter |
| Liu, Der-Zheng | Realtek Semiconductor Corp. | yes | Voter |
| Liu, Jeff | Broadcom Corporation | yes | Voter |
| Liu, Jianhan | MediaTek Inc. | yes | Voter |
| Liu, Peng | Huawei Technologies Co., Ltd | no | Non-Voter |
| LIU, QINGLAI | Panasonic Holdings Corporation | yes | Voter |
| Liu, Ying | NXP Semiconductors | yes | Voter |
| Liu, Yong | Apple, Inc. | no | Voter |
| Liubogoshchev, Mikhail | Nokia | yes | Potential Voter |
| Lorgeoux, Mikael | Canon Research Centre France | yes | Voter |
| Lou, Hanqing | InterDigital, Inc. | yes | Voter |
| Lovison, Federico | Cisco Systems, Inc. | yes | Voter |
| Lu, kaiying | MediaTek Inc. | yes | Voter |
| Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |
| LU, Yuxin | TCL Industries | yes | Voter |
| Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. | yes | Voter |
| Luo, Hui | Infineon Technologies | yes | Voter |
| Luo, Sixian | SHARP CORPORATION | yes | Voter |
| Ma, Jing | Toyota Motor Corporation | yes | Voter |
| Ma, Li | MediaTek Inc. | yes | Voter |
| Ma, Yongsen | SAMSUNG ELECTRONICS | yes | Voter |
| Mak, Siukai | Broadcom Corporation | yes | Voter |
| Malinen, Jouni | Qualcomm Technologies, Inc | yes | Voter |
| Manoharan, Jegan | Cisco Systems, Inc. | yes | Potential Voter |
| Marks, Roger | EthAirNet Associates | no | ExOfficio |
| Martinez Vazquez, Marcos | MaxLinear Corp | yes | Voter |
| Maru, Sandra | IEEE-SA | no | Non-Voter |
| Max, Sebastian | Ericsson AB | yes | Voter |
| McCann, Stephen | Huawei Technologies Co., Ltd | yes | Voter |
| Mehrnoush, Morteza | Apple Inc | yes | Voter |
| Mehta, Mehul | Pharrowtech BV | yes | Voter |
| MELZER, Ezer | Toga Networks, a Huawei company | yes | Voter |
| MENANOR, SAMUEL | Hanbat National University | yes | Potential Voter |
| Merlin, Simone | Qualcomm Incorporated | no | Voter |
| Minotani, Jun | Panasonic Holdings Corporation | yes | Potential Voter |
| Miwa, Shinya | Canon Research Centre France | yes | Voter |
| Mizuno, Yuta | SHARP CORPORATION | yes | Aspirant |
| Moelker, Dignus-Jan | Broadcom Corporation | yes | Voter |
| Mohamed Hassan Salem, Nedime Pelin | Cisco Systems, Inc. | no | Voter |
| Mohamed, Ahmed | NXP Semiconductors | yes | Voter |
| Monajemi, Pooya | Apple Inc | yes | Voter |
| Montemurro, Michael | Huawei Technologies Co., Ltd | yes | Voter |
| Montreuil, Leo | Broadcom Corporation | yes | Voter |
| Moon, Juseong | Korea National University of Transportation | yes | Voter |
| Morioka, Hitoshi | SRC Software | yes | Voter |
| Motozuka, Hiroyuki | Panasonic Holdings Corporation | yes | Voter |
| Mourtada, Yasser | Ofinno | yes | Voter |
| Mukherjee, Suprojit | Infineon Technologies | yes | Voter |
| Mutgan, Okan | Nokia | yes | Voter |
| Naik, Gaurang | Qualcomm Technologies, Inc | yes | Voter |
| Namvar, Nima | Charter Communications | yes | Voter |
| NANDAGOPALAN, SAI SHANKAR | Synaptics | yes | Voter |
| Naribole, Sharan | Apple Inc. | no | Voter |
| Nassiri Toussi, Karim | Broadcom Corporation | yes | Voter |
| Nayak, Peshal | Samsung Research America | yes | Voter |
| Neishaboori, Azin | General Motors Company | yes | Voter |
| New, Wee Kiat | huawei international pte ltd | yes | Non-Voter |
| Nezou, Patrice | Canon Research Centre France | yes | Voter |
| Ng, Boon Loong | Samsung Electronics | yes | Voter |
| Nikolich, Paul | Self | no | Non-Voter |
| Nishat, Muhammad Kamran | HaiLa Technologies | yes | Potential Voter |
| Nogami, Toshizo | SHARP CORPORATION | yes | Voter |
| Noh, Si-Chan | Newracom Inc. | yes | Voter |
| Nomura, Tetsuya | DENSO TEN Limited | no | Non-Voter |
| Okumoto, Yusuke | Advanced Telecommunications Research Institute International (ATR) | yes | Non-Voter |
| Omar, Hassan | Huawei Technologies Co., Ltd | yes | Voter |
| Orr, Stephen | Cisco Systems, Inc. | yes | Voter |
| ouzane, riadh | VESTEl, IMU | yes | Voter |
| Ozbakis, Basak | VESTEL Electronics Corp. | yes | Potential Voter |
| Pakrooh, Pooria | Qualcomm Incorporated | yes | Voter |
| Pan, Ju Yan | Huawei Technologies Co., Ltd | yes | Voter |
| Pare, Thomas | MediaTek Inc. | yes | Voter |
| Park, Eunsung | LG ELECTRONICS | yes | Voter |
| Park, Minyoung | Apple Inc. | yes | Voter |
| Park, Sungjin | senscomm | yes | Voter |
| Parsons, Glenn | Ericsson AB | yes | ExOfficio |
| Patil, Abhishek | Qualcomm Incorporated | yes | Voter |
| Patil, Sandhya | Synaptics Inc | yes | Voter |
| Patwardhan, Gaurav | Hewlett Packard Enterprise | yes | Voter |
| Peng, Lan | Huawei Technologies Co., Ltd | yes | Voter |
| Perahia, Eldad | Hewlett Packard Enterprise | yes | Voter |
| Pereira da Costa, Mario | Nokia | yes | Aspirant |
| Perez, Javier | Ofinno | yes | Potential Voter |
| Petrick, Albert | Jones-Petrick and Associates, LLC. | yes | Voter |
| Petry, Brian | Broadcom Corporation | yes | Voter |
| Pettersson, Charlie | Ericsson AB | yes | Voter |
| Porat, Ron | Broadcom Corporation | yes | Voter |
| Portier, Fabrice | Silicon Laboratories | no | Non-Voter |
| Pottigari, Sachin | NXP Semiconductors | yes | Voter |
| Procyk, Ian | Cisco Systems | yes | Potential Voter |
| Puducheri, Srinath | Broadcom Corporation | yes | Voter |
| Pulikkoonattu, Rethnakaran | Broadcom Corporation | yes | Voter |
| Qi, Yinan | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Potential Voter |
| Qi, Yue | SAMSUNG ELECTRONICS | yes | Potential Voter |
| QIAN, BIN | Huawei Technologies Co., Ltd | no | Voter |
| Qian, Yurong | ZTE Corporation | yes | Voter |
| QingLiang, shou | ZTE corporation | yes | Potential Voter |
| Quan, Li | ZTE Corporation | yes | Voter |
| Quan, Yingqiao | Spreadtrum | yes | Voter |
| Qureshi, Haneya | General Motors | yes | Potential Voter |
| Rafique, Saira | Istanbul Medipol University, Vestel | yes | Voter |
| Rai, Kapil | Qualcomm Incorporated | yes | Voter |
| Raissinia, Alireza | Qualcomm Incorporated | yes | Voter |
| Rajashekar, Rakshith | Broadcom Corporation | yes | Voter |
| Ralle, Helene | Orange | yes | Voter |
| Rashid, Mohammad Mamunur | Apple Inc. | yes | Non-Voter |
| Ratnam, Vishnu | Samsung Research America | yes | Voter |
| Redlich, Oded | Huawei Technologies Co., Ltd | no | Voter |
| Regev, Dror | Toga Networks (A Huawei Company) | yes | Voter |
| REICH, MOR | Huawei Technologies Co., Ltd | yes | Voter |
| Renno, Raquel | Article 19 | yes | Non-Voter |
| Rezk, Meriam | Qualcomm Technologies, Inc | yes | Voter |
| Rios, Carlos | Terabit Wireless Internet LLC | yes | Voter |
| Rison, Mark | Samsung Cambridge Solution Centre | yes | Voter |
| Robert, Joerg | FAU Erlangen-Nuernberg / Fraunhofer IIS | no | Voter |
| Rodine, Craig | Sandia National Laboratories | no | Voter |
| Rodriguez, Stephen | Cisco Systems, Inc. | yes | Voter |
| Rolfe, Benjamin | Blind Creek Associates | no | Voter |
| Rosdahl, Jon | Qualcomm Technologies, Inc. | yes | Voter |
| Roy, Rishabh | SAMSUNG ELECTRONICS | yes | Voter |
| Roy, Sayak | NXP Semiconductors | yes | Voter |
| Ryu, Kiseon | WILUS Inc. | yes | Voter |
| S, Manoj | Synaptics | yes | Potential Voter |
| Sadiq, Bilal | Samsung Research America | yes | Voter |
| Sahyoun, Walaa | Canon Research Centre France | yes | Voter |
| Sakamoto, Ryunosuke | SHARP CORPORATION | yes | Voter |
| Sampath, Hemanth | Qualcomm Incorporated | no | Potential Voter |
| Sand, Stephan | German Aerospace Center (DLR) | no | Voter |
| Sanderovich, Amichai | Wiliot Ltd | yes | Voter |
| Schelstraete, Sigurd | MaxLinear | yes | Voter |
| Scott, David | Cisco Systems, Inc. | yes | Potential Voter |
| Segev, Jonathan | Intel | yes | Voter |
| Seguine, Ryan | Infineon Technologies | yes | Aspirant |
| Seo, Sangho | Broadcom Corporation | yes | Voter |
| Seok, Yongho | Apple Inc | no | Voter |
| Serafimovski, Nikola | University of Cambridge | no | Voter |
| Sethi, Ankit | NXP Semiconductors | yes | Voter |
| Sevin, Julien | Canon Research Centre France | yes | Voter |
| Shabdanov, Samat | Mediatek Inc | yes | Potential Voter |
| Shafin, Rubayet | Samsung Electronics | yes | Voter |
| Shatil, Ohad | Zebra Technologies | yes | Non-Voter |
| Shaw, Amit | Infineon Technologies | yes | Voter |
| Shayovitz, Shachar | Huawei Technologies Co., Ltd | yes | Voter |
| Shellhammer, Stephen | Qualcomm Incorporated | yes | Voter |
| shen, wendi | National Taiwan University | yes | Voter |
| Sherlock, Ian | Texas Instruments Inc. | yes | Voter |
| Shi, Jiacheng | TCL | yes | Aspirant |
| shi, shuyu | TP-Link Systems Inc. | no | Voter |
| SHI, YONGSHENG | Guangdong OPPO Mobile Telecommunications Corp.,Ltd; Innopeak Technology | yes | Aspirant |
| Shi, Zhenpeng | Huawei Technologies Co., Ltd | yes | Voter |
| Shilo, Shimi | Huawei Technologies Co., Ltd | no | Voter |
| Shirakawa, Atsushi | SHARP CORPORATION | yes | Voter |
| Shukla, Ashish | Amazon, Inc | yes | Voter |
| siaud, isabelle | Orange | yes | Voter |
| Silverman, Matt | Cisco Systems, Inc. | yes | Non-Voter |
| Singh, Aditi | Charter Communications | yes | Voter |
| Siyao, Tai | Ningbo University | yes | Aspirant |
| Smith, Graham | SR Technologies | no | Voter |
| Smith, Graham | SR Technologies | yes | Non-Voter |
| So, Youngwan | Samsung Electronics Co., Ltd. | no | Voter |
| Son, Ju-Hyung | WILUS Inc. | yes | Voter |
| Sood, Ayush | Infineon Technologies | yes | Voter |
| Sosack, Robert | Molex Incorporated | yes | Voter |
| Srinivasa, Sudhir | NXP Semiconductors | yes | Voter |
| Stacey, Robert | Intel | yes | Voter |
| Stanley, Dorothy | Hewlett Packard Enterprise | yes | Voter |
| Stott, Noel | Keysight Technologies | yes | Voter |
| Strobel, Rainer | MaxLinear | yes | Voter |
| Stuebing, Gary | Cisco Systems, Inc. | no | Potential Voter |
| Su, Hang | Broadcom Corporation | yes | Voter |
| SUH, JUNG HOON | Huawei Technologies Co., Ltd | yes | Voter |
| Sumi, Takenori | Mitsubishi Electric Corporation | no | Non-Voter |
| Sun, Bo | Sanechips | yes | Voter |
| Sun, Li-Hsiang | MediaTek Inc. | no | Voter |
| Sun, Yanjun | Apple Inc | yes | Voter |
| Sundman, Dennis | Ericsson AB | yes | Non-Voter |
| Sung, Hyeonjun | WILUS Inc. | yes | Voter |
| SUZUKI, Shuntaro | Yamaha Corporation | yes | Voter |
| Swartz, Matt | Cisco | yes | Potential Voter |
| Taherzadeh, Mahmoud | Qualcomm Technologies, Inc | yes | Voter |
| Takai, Mineo | Space-Time Engineering | no | Voter |
| Talarico, Salvatore | Nokia | yes | Voter |
| Talha, Mohd. | NXP Semiconductors | no | Voter |
| Tanaka, Yusuke | Sony Corporation | yes | Voter |
| Tang, Zhuqing | Huawei Technologies Co., Ltd | yes | Voter |
| Taori, Rakesh | Infineon Technologies | yes | Voter |
| Thakur, Sidharth | Apple Inc | no | Voter |
| Thota, Sri Ramya | Infineon Technologies | yes | Voter |
| Tian, Bin | Qualcomm Incorporated | no | Voter |
| Tinnakornsrisuphap, Peerapol | Qualcomm Incorporated | yes | Voter |
| Tota, Kazuyuki | Canon | yes | Voter |
| Trainin, Solomon | Wiliot | yes | Voter |
| Tsai, Tsung-Han | MediaTek Inc. | yes | Voter |
| Tsao, Wilson | Mediatek Inc | yes | Potential Voter |
| Tseng, Yen Hsiung | MediaTek Inc. | yes | Voter |
| Tsodik, Genadiy | Huawei Technologies Co., Ltd | yes | Voter |
| Tsujimaru, Yuki | Canon | yes | Voter |
| Tu, Weichi | Himoace | yes | Aspirant |
| Turner, Michelle | IEEE Staff | no | Non-Voter |
| Urabe, Yoshio | Panasonic Holdings Corporation | yes | Voter |
| Vaidya, Maulik | Charter Communications | yes | Voter |
| Val, Inaki | MaxLinear, Inc. | yes | Voter |
| Van Zelst, Allert | Qualcomm Technologies Netherlands B.V. | yes | Voter |
| Varshney, Prabodh | Nokia | yes | Voter |
| Venkatesh, Narasimhan | Silicon Laboratories | yes | Voter |
| Verenzuela, Daniel | Sony Group Corporation | yes | Voter |
| Verma, Sindhu | Broadcom Corporation | yes | Voter |
| Vermani, Sameer | Qualcomm Technologies, Inc. | yes | Voter |
| Verso, Billy |  | no | Non-Voter |
| Videv, Stefan | Kyocera SLD Laser | yes | Voter |
| Wang, Chao Chun | MediaTek Inc. | yes | Voter |
| Wang, Hao | Tencent | yes | Voter |
| Wang, Huizhao | NXP Semiconductors | yes | Voter |
| Wang, Lei | Futurewei Technologies | yes | Voter |
| Wang, Qi | Apple Inc | yes | Voter |
| Wang, Steven Qi | Huawei Technologies Co., Ltd | yes | Voter |
| WANG, XIAO | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Non-Voter |
| Wang, Xiaofei | InterDigital, Inc. | yes | Voter |
| Wang, Ying | InterDigital, Inc. | yes | Voter |
| Wang, Zhongyi | ZTE Corporation | yes | Potential Voter |
| Wang, Zisheng | ZTE Corporation | yes | Voter |
| Want, Roy | Google | no | Voter |
| Ward, Lisa | Rohde & Schwarz | yes | Voter |
| Wee, Gaius | Panasonic Holdings Corporation | yes | Voter |
| Wei, Dong | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |
| Wendt, Matthias | Signify | yes | Voter |
| Wentink, Menzo | Qualcomm Incorporated; Qualcomm Technologies, Inc | no | Voter |
| White, Gregory | Cable Television Laboratories Inc. (CableLabs) | yes | Voter |
| Wilhelmsson, Leif | Ericsson AB | yes | Voter |
| Wong Mosquera, Blanca | Cisco Systems, Inc | yes | Potential Voter |
| WOODE, THEODORE | Hanbat National University | yes | Potential Voter |
| Wu, Kanke | Apple Inc | yes | Voter |
| Wu, Tianyu | Apple, Inc. | yes | Voter |
| Wu, Wayne | MediaTek Inc. | yes | Voter |
| Wullert, John | Peraton Labs | yes | Voter |
| Xia, Qing | Sony Corporation | yes | Voter |
| xiang, Huangfu | Xidian University | yes | Voter |
| Xiao, Bo | ZTE Corporation | yes | Voter |
| Xiao, Ding | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Aspirant |
| Xiao, Tong | Xiaomi Communications Co., Ltd. | yes | Voter |
| Xin, Liangxiao | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |
| Xin, Yan | Huawei Technologies Co., Ltd | yes | Voter |
| Xu, Fangxin | Longsailing Semiconductor | yes | Voter |
| xu, haidong | ZTE Corporation | yes | Non-Voter |
| Xu, Weijie | Beijing OPPO telecommunications corp., ltd. | yes | Voter |
| Xu, Yanchao | Amlogic | yes | Voter |
| Xu, Yue | Huawei Technologies Co., Ltd | yes | Voter |
| Xue, Qi | Qualcomm Incorporated | no | Voter |
| YAGHOOBI, HASSAN | Apple Inc | yes | Voter |
| Yamada, Ryota | SHARP CORPORATION | yes | Voter |
| Yan, Aiguo | SAMSUNG ELECTRONICS | yes | Voter |
| Yan, Min | Huawei Technologies Co., Ltd | yes | Voter |
| Yan, Peng | Wi-Fi Alliance | yes | Potential Voter |
| Yan, Zhongjiang | Northwestern Polytechnical University | yes | Voter |
| Yanamandra, Subrahmanyam | Broadcom Corporation | yes | Voter |
| Yang, Hang | Ruijie Networks Co. Ltd | yes | Voter |
| Yang, Haorui | China Mobile | no | Voter |
| Yang, Hsi-Chang | Mediatek Inc | yes | Potential Voter |
| Yang, Jay | ZTE Corporation | yes | Voter |
| Yang, Lin | Qualcomm Incorporated | yes | Voter |
| Yang, Mao | Northwestern Polytechnical University | yes | Voter |
| YANG, RUI | InterDigital, Inc. | yes | Voter |
| Yang, Steve TS | MediaTek Inc. | yes | Voter |
| Yang, Xun | Huawei Technologies Co., Ltd | no | Voter |
| Yang, Yunpeng | TP-Link Systems Inc. | yes | Voter |
| Yang, Zigui | Samsung Electronics Co,. Ltd. | yes | Potential Voter |
| Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) | yes | Voter |
| yaodong, zhang | ZTE Corporation | yes | Aspirant |
| Yee, James | MediaTek Inc. | yes | Voter |
| Yee, Peter | NSA-CSD | yes | Voter |
| Yin, Shirley | Clourney Semiconductor | yes | Aspirant |
| Yong, Su Khiong | Apple, Inc. | no | Voter |
| Yoon, Yelin | LG ELECTRONICS | yes | Voter |
| Yu, Jian | Huawei Technologies Co., Ltd | yes | Voter |
| Yu, Mao | Ripple Technology | yes | Potential Voter |
| Yuan, Liquan | ZTE Corporation | yes | Potential Voter |
| Yuanjian, Zhang | ZTE Corporation | yes | Aspirant |
| Zeng, Ruochen | Apple Inc | yes | Voter |
| Zhang, Hongyuan | NXP Semiconductors | no | Voter |
| Zhang, Jiayi | Ofinno | yes | Voter |
| Zhang, Lyutianyang | Huawei Technologies Co., Ltd | yes | Potential Voter |
| Zhang, Maolin | Huawei Technologies Co., Ltd | yes | Voter |
| Zhang, Rong | Apple Inc | yes | Voter |
| Zhang, Yan | Apple Inc | yes | Voter |
| zhang, zhigang | ZTE Corporation | yes | Aspirant |
| Zhao, Xuwen | TCL | yes | Potential Voter |
| Zhao, Yue | Huawei Technologies Co., Ltd | yes | Voter |
| Zheng, Xiayu | NXP Semiconductors | yes | Voter |
| ZHENG, ZE | iTenest; Shenzhen iTest Technology Co.,Ltd. | yes | Voter |
| Zhong, Ke | Ruijie Networks Co.,Ltd. | yes | Voter |
| Zhou, Chengzhi | Apple Inc. | no | Voter |
| Zhou, Huixuan | Guangdong OPPO Mobile Telecommunications Corp., Ltd. | yes | Aspirant |
| Zhou, Lei | H3C Technologies Co., Limited | yes | Voter |
| Zhou, Pei | TCL | yes | Voter |
| Zhou, RenFang | TP-Link Systems Inc. | yes | Voter |
| Zhou, Renlong | Sanechips Technology Co., Ltd. | yes | Voter |
| Zhu, Yu | TP-Link System Inc. | yes | Voter |
| Zimmer, Ethan | Cisco Systems, Inc. | yes | Potential Voter |
| Zimmerman, George | CME Consulting/Analog Devices, APL Group, Cisco, Marvell, OnSemi, SenTekSe LLC, Sony | no | Non-Voter |
| Zuniga, Juan Carlos | Cisco Systems, Inc. | no | Voter |
| Zuo, Zhisong | Guangdong OPPO Mobile Telecommunications Corp.,Ltd | yes | Voter |