IEEE P802.11  
Wireless LANs

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| Minutes of the IEEE P802.11 Full Working Group | | | | |
| Date: 2018-05-07 | | | | |
| Author(s): | | | | |
| Name | Company | Address | Phone | email |
| Stephen McCann | BlackBerry Ltd | The Pearce Building, West Street, Maidenhead,  SL6 1RL, UK | +44 1753 667099 | [smccann@blackberry.com](mailto:smccann@blackberry.com) |
| Mike Montemurro | BlackBerry |  |  |  |

Abstract

This document constitutes the minutes of the IEEE 802.11 full working group for the May 2018, Warsaw, Poland meeting.

Please note that all affiliations at this meeting are shown in Annex A.

**IEEE 802 Wireless Interim Meeting – #109 Joint Opening Plenary**

**Marriott Hotel**

**Warsaw, Poland**

**May 7 - 11, 2018**

**Monday, 7 May 2018**

**8:00** 802.11, 802.15, 802.18, 802.19, 802.21, and 802.24 Chairs called the joint meeting to order. IEEE 802.15 attendance is included as Annex A.

General announcements:

* No photography, no audio recording
* Social – Wednesday is on level 2 of the hotel
* Don’t forget, book your room and register for July’s session

Straw Poll of new attendees: 10

**8:08**  IEEE patent policy

802.15 WG chair read the IEEE-SA instructions and displayed the four slides explaining patent policy and informed the attendees that additional information could be found on the PatCom web site: ([**http://standards.ieee.org/board/pat/pat-slideset.ppt**](http://standards.ieee.org/board/pat/pat-slideset.ppt)**)**.

802.15 WG chair read IEEE anti-trust policy.

**8:11** Financial report by J Rosdahl (Qualcomm) docs [11-18-0615-00](https://mentor.ieee.org/802.11/dcn/18/11-18-0615-00-0000-treasurer-report-may-2018-warsaw.pptx),   
[15-18-0193-00](https://mentor.ieee.org/802.15/dcn/18/15-18-0193-00-0000-treasurer-report-may-2018-warsaw.pptx)

Total liabilities and equity $519,324.31 (not including this meeting)

The number of people who are currently registered at this meeting is 279

**8:20** Wireless and IMAT announcements by R Alfvin (Linespeed) ([15-18-0111-01](https://mentor.ieee.org/802.15/dcn/18/15-18-0111-01-0000-opening-plenary-information-2018.pptx))

**8:21** WG15 Chair informed the group that the Wireless Chairs Standing Committee (WCSC) met yesterday, Sunday at 16:00 local time. Chair noted that this is an open meeting, all are encouraged to attend. Minutes are available at [ec-18-0009-00-WCSG](https://mentor.ieee.org/802-ec/dcn/18/ec-18-0009-00-WCSG-irvine-january-2018-minutes.docx)

**8:23** Review future sessions (document # [15-17-0209-00](https://mentor.ieee.org/802.15/dcn/18/15-18-0209-00-0000-802-15-waw-2018-graphic-agenda.xlsx))

* July 8-13, 2018, Manchester Grand Hyatt, San Diego, CA, USA, 802 Plenary Session.
* September 9-14, 2018, Hilton Waikoloa Village, Kona, HI, USA, *802 Wireless Interim Session.*\*
* November 11-16, 2018, Marriott Marquis Queens Park Bangkok Thailand, 802 Plenary Session.
* January 13-18, 2019 Hilton St. Louis, MO, at the Ballpark (TBC)
* March 10-15, 2019, Hyatt Regency / Fairmont Hotel Vancouver, Vancouver, Canada
* May 12-17, 2019, Grand Hyatt Atlanta in Buckhead , Atlanta, Georgia, USA
* July 14-19, 2019, Austria Congress Centre, Vienna, Austria, 802 Plenary Session.
* September 15-20, 2019 - Marriott Hanoi, Hanoi, Vietnam (TBC)
* November 10-15, 2019, Hilton Waikoloa Village, Kona, HI, USA, 802 Plenary Session
* Future venues 2020 Lisbon Marriott, Budapest Marriott, Vienna Hilton, Athens Hilton, Sorrento Hilton, JW Bucharest.

**8:26 Working Group Updates**

802.11 by Dorothy Stanley (HPE), (document [11-18-0623-00](https://mentor.ieee.org/802.11/dcn/18/11-18-0623-00-0000-may-2018-working-group-agenda.xlsx))

* 303 voters

802.15 by B Heile (document [15-17-0209-00](https://mentor.ieee.org/802.15/dcn/18/15-18-0209-00-0000-802-15-waw-2018-graphic-agenda.xlsx))

* 63 voters
* TG4md 15.4 revision
* TG 7m Optical Wireless Communications
* TG10a Routing Mode Addressing (RMA) 15.10 MAC
* TG12 Upper Layer Interface (ULI) for 802.15.4
* TG13 Multi-Gigabit OWC
* TG 15.4w Low Power Wide Area (LPWA)
* TG 15.4x FAN enhancements (FANE)
* TG 15.4y Security Next Generation (SECN)
* TG 15.4z (enhanced low rate UWB RFID PHY)

802.18 by J Holcomb ([18-18-0050-00](https://mentor.ieee.org/802.18/dcn/18/18-18-0050-00-0000-agenda-warsaw-interim-8-10-may-2018-rr-tag.pptx))

* 41 voting members
* FCC NPRM Section 7
* FCC NOI/PN 4GHz
* EU Items
* WiFi / UWB points
* IEEE EU position statement
* IEEE 802 Fellowship request

802.19 S Shellhammer (19-18-0025-00)

* 34 voters
* Ongoing revision effort (in Sponsor Ballot)
* Interest Group formed on coexistence in sub-GHz
* Review of 802.11ax’s coexistence’s statement re: 6GHz

802.21 Subir Das (21-18-0020-00)

* 15 voting members
* Interest Group on Network Enablers for Seamless HMD based VR content Service

802.24 Tim Godfrey

* 28 voting members
* discussion on liaison activities (IEEE PES and IEC)
* TSN white paper

**AoB**

* R Marks (Huawei) – NENDICA activities, meeting this afternoon

**9:02** Joint meeting adjourned

**IEEE 802.11 Interim Meeting – Session #169**

**Warsaw, Poland**

**May 7th – 11th, 2018**

**IEEE 802.11 Opening Plenary, Monday 7th May 2018**

Presiding chair: Dorothy Stanley (Hewlett Packard Enterprise) opened the meeting at 09:00 Central European Time (CET) and declared quorum for the Session.

2nd Vice-chair (VC2): Robert Stacey Intel Corporation

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

Acting Secretary: Michael Montemurro BlackBerry Ltd.

There are 303 voting members and 11 Ex Officio voters of IEEE 802.11

There were 153 people in the room

11 who ask to be recognized as such in the 802.11 voters list.

1. **Notices** (11-18-0623r0)
   1. No photographs at this meeting and please turn your mobiles to vibrate.
   2. Chair: Are there any members of the press present.
      1. None
2. **Approve/modify working group agenda** (11-18-0622r1)
   1. This is a summary of all room allocations for the week.
   2. Chair: I suggest we approve this agenda.
   3. Changes to agenda graphic:
      1. There’s an additional session for WNG added on Thursday.
   4. **Move to approve the agenda 11-18-0622r1 (“Agenda Graphic” tab and the “WG11” tab Monday agenda)**
      1. Moved: Jim Lansford, 2nd: Adrian Stephens
      2. No objection to approving by unanimous consent
3. **March 2018 WG Minutes**
   1. **Move to approve the Rosemont March 2018 WG minutes document 11-18-0348r1**
   2. Moved: Michael Montemurro, 2nd: Stuart Kerry
   3. Following neither discussion nor dissent the minutes were approved by unanimous consent.
4. **Attendance**
   1. Welcome to the 7 new participants in this meeting.
   2. Chair: Please note that Stephen McCann (Secretary) will be holding a newcomer’s session at 13:30.
5. **Call for essential Patents** (11-18-0649r0)
   1. VC2: read out the current PatCom rules, which were revised a couple of weeks ago and then called for essential patents information, as shown by:
   2. <http://standards.ieee.org/board/pat/pat-slideset.ppt>
      1. There were no issues raised regarding the call for essential patents. There was no response to the call for essential patents.
   3. VC2: The slide about IEEE 802 meeting participation was also mentioned.
   4. VC2: read out other policies and procedures for the meeting. There were some small changes made to the IEEE-SA rules and LMSC policies and procedures. These all became effective on 1st May 2018.
   5. VC2: There are changes about the loss of voting rights within the IEEE 802 Policies and Procedures.
   6. VC2: Review of document repository and reminder that minutes need to be posted following the meeting.
6. **Announcements**
   1. **Liaisons** (11-18-0623r0 slide #4)
      1. Chair: One liaison from ETSI – posted as document 11-08-690r0. This will be discussed in the NGV SG.
   2. **EC and standard board decisions** (slides #5 & #6)
      1. Chair: The EC approved the following items on the slide.
   3. **Meeting logistics** (11-18-614r1 slide #4)
      1. VC1: this slide deck shows information about other WG meetings, future meetings and logistics this week.
      2. Slide #5 shows a link to this week’s online room schedule and a meeting room layout URL, within this convention center.
      3. Reminder that there are topics relevant to IEEE 802.11 to be covered in IEEE 802.18 and IEEE 802.19 this week.
      4. There is an Events app which is available for most hand-held devices and provides the schedule.
         1. The app is only being used for this meeting.
      5. The next meeting is in July 2018 in San Diego, CA, USA.
      6. The next wireless interim will be held in Sept 2018 in Waikoloa, HI.
   4. **Recording Attendance** (Slide #11)
      1. VC1: There are 279 registered people for this week’s meeting.
      2. VC1: Please remember to record your attendance for each 2 hour slot during the week.
   5. **WG Documents** (slide #12)
      1. VC1: If you want to synchronize all the documents on mentor, please use the local server and not the external link. The IT support company this week is Linespeed, so please note the new SSID, links and URLs. The IT support center is along the corridor from the IEEE 802 registration desk.
   6. **Social and Catering options** (slides ##14)
      1. VC1: Breakfast is included with your hotel rate. Lunch will be provided.
      2. VC1: There is a social on Wednesday evening, from 6:30pm-9:30pm at the restaurant on level 2 of the hotel.
7. **Status of all groups** (11-18-629r0)
   1. **Group summary**
      1. Chair: Review current IEEE 802.11 groups.
   2. **Sub-Group Status**
      1. Chair: Please note the changes to sub-group officers for this week.
   3. **Summary of Ballots**
      1. There have been no ballots between the March 2018 meeting and now
8. **Group Summaries** (11-18-648r1)
   1. Special notes were mentioned for the following groups:
   2. **Editor’s meeting and ANA**
      1. Tomorrow morning at 7.00am, including the ANA status, style guides and numbering situation.
      2. ANA assignment has been made for Opportunistic Wireless Encryption after it was published as an IETF RFC.
   3. **AANI**
      1. Review the “Network Enhancements for the Next Decade” activity (NENDICA) and IMT-2020 requirements.
   4. **ARC**
      1. Joint meeting with TGba on Thursday PM2.
      2. Call for volunteers on Yang (Yet Another Next Generation) and NETCONF (Network Configuration) activity.
   5. **Coexistence SC**
      1. Discuss PD/ED issues and sharing unlicensed spectrum.
   6. **PAR SC**
      1. Not meeting this week.
      2. Reminder that deadlines for PAR submissions are 8 June.
   7. **WNG**
      1. There are 5 presentations this week for this group, which meets on Tuesday at 8am and Thursday at 10:30am.
   8. **JTC1**
      1. Review JTC1/SC6 status.
   9. **TGmd**
      1. LB232 passed. Processing 623 comments received from LB232.
   10. **TGaj**
       1. Has completed work.
   11. **TGak**
       1. Has completed work.
   12. **TGaq**
       1. Waiting for approval from RevCom in their June meeting..
   13. **TGax**
       1. Working to approve a draft to go to letter ballot after this meeting.
   14. **TGay**
       1. Continue to resolve comments from LB 231.
   15. **TGaz**
       1. Continue development of spec framework and amendment text.
       2. Target initial LB for Nov 2018.
   16. **TGba**
       1. Goal is to approve draft 0.2 and create draft 0.3 at the end of this meeting.
   17. **LC SG**
       1. Looking at timelines for amendment development and see what initial work can be done before the Task Group is formed.
   18. **BCS TIG/SG**
       1. Complete use case discussions and begin discussion on creating a PAR and CSD.
   19. **Full Duplex (FD) TIG**
       1. Continue development on possible work for full duplex TIG
   20. **NGV SG**
       1. Hear initial presentations and consider ETSI liaison.
9. **Recess**
   1. Meeting recessed at 10:05 CET.

**Wednesday, 9th May 2018**

**IEEE 802.11 Mid-Week Plenary**

Presiding chair: Dorothy Stanley (HPE) opened the meeting at 10:30 CET.

Secretary: Stephen McCann BlackBerry Ltd.

157 people present.

1. **Approve/modify working group agenda** (11-18-0622r2)
   1. Chair: There are a couple of minor changes to the agenda fixing links and various items.
   2. Chair: Please note that there will be an award ceremony and photographs today, once this meeting has recessed, as the taking of photographs is not allowed in the meeting.
   3. **Move to approve the agenda 11-18-0622r2.**
      1. Moved: Nikola Serafimovski, 2nd: Al Petrick
      2. No objection to approving the agenda by unanimous consent.
2. **Call for Essential Patents**
   1. The chair read out the Potentially Essential Patents slide.
   2. No statements were made.
   3. Please remember that everyone here is participating as an individual.
3. **CAC**
   1. Reminder about 19.30 CET meeting on Thursday. The purpose of this meeting is to prepare for the Friday closing plenary. This is an open meeting and everyone is welcome to attend.
4. **Meeting Decorum** (11-18-0624r0 slide #7)
   1. Chair: Please remember that professional behavior is expected in all the IEEE 802.11 meetings, including the discussions in the hallways.
   2. No questions
5. **Announcement**
   1. IEEE 802.19 chair: There is a new co-existence group regarding IEEE 802.11ah and 802.15.4g. Please read the IEEE 802.19 email reflector for further information.
   2. No questions
6. **Social** (11-18-0613r2)
   1. VC1: Please remember that there is a social this evening, as shown on slide #17. Please wear your name badge to attend. This will be in the breakfast restaurant area on level 2.
   2. No questions
7. **IETF Liaison** (11-18-0891r0)
   1. This is report about the current IEEE 802.11 related activities within the IETF.
   2. The next IETF meeting is July 14th – 20th 2018 in Montreal.
   3. Please note that the November 2018 IETF meeting is in the same Bangkok hotel, the week before the IEEE 802.11 meeting, so it is possible to attend the two conferences back to back.
   4. Question (Q): I note that the EMU group effort is directly applicable to IEEE 802.11 (through 802.1X) authentication due to updates to commonly used EAP methods being planned (e.g., EAP-TLS and EAP-AKA’). Are we tracking this group?
   5. Answer (A): I’m not sure, but I’ll track this in the future.
   6. Q: Regarding slide #5, do you know what they are doing regarding Wi-Fi, for example adaptive queue management etc.
   7. A: I’ll have to check and respond to you on that.
8. **IEEE 802.18** (18-18-0050r1)
   1. This is a summary of the IEEE 802.18 activities this week.
   2. Comment (C): regarding IEEE 802.19, the co-existence document from IEEE 802.11ax has now been updated based on recent 802.11ax changes and so IEEE 802.19 will hold a teleconference to consider this document.
9. **Room assignment updates** (11-18-0622r2)
   1. Released rooms: LC SG Thurs AM1, TGax ad-hoc 1, Wed PM2
   2. Required rooms: NGV Thurs PM2, TGay Thurs PM2, TGba Thurs AM1, Thurs PM1
   3. C: I speak against adding the extra TGay slot as I feel that it’s using up too much time.
   4. Q: Could the NGV slot be moved please?
   5. A: No, sorry as the room assignments will not work
   6. **Motion to approve all of the above requests, except the TGay addition, with the updated room graphic included in an updated agenda 11-18-0622r3**
      1. Moved: Adrian Stephens, 2nd: Jonathan Segev
      2. No objection to approving the agenda by unanimous consent.
   7. **Motion to approve the TGay addition, with the updated room graphic included in an the updated agenda 11-18-0622r3**
      1. Moved: Edward Au, 2nd: George Calcev
      2. C: I speak against this, as TGay has already had 9 slots this week.
      3. C: I support this motion, as it was fully discussed in TGay
      4. C: I speak against this, as it’s becoming impossible for member to participate in other groups.
         1. **Motion to call the question**
         2. Moved: Chris Hanson, 2nd: Anuj Batra
         3. No objection to approving the agenda by unanimous consent.
      5. C: What approval level is required for this main motion?
      6. Chair: 50%
      7. For: 34, Against: 5, Abstain: 52 (Motion passes)
      8. C: Thanks for everyone’s work in TGay, as it has been a very busy week.
10. **IEEE 802.3** (11-18-0624r1 slide #8)
    1. Chair: This is a request from the IEEE 802.3 chair to consider new requirements for new IEEE 802.3 standards to support cabling for 802.11 ax/ad/ay systems. Please note that IEEE 802.11 received a similar request from IEEE 802.3 in 2014 for IEEE 802.11ac systems.
    2. The IEEE 802.11ax and IEEE 802.11ay chairs have been asked about this as shown in slide #9.
    3. There is other information in document 11-18-0738r0.
    4. Chair: So should we form an ad-hoc group to discuss this further, or deal with it in the IEEE 802.11 plenaries?
    5. C: For IEEE 802.11ac, IEEE 802.3 were the ones to work on this, so I don’t think there’s much to be done by IEEE 802.11 members at the moment. Can we invite IEEE 802.3 to provide more details.
    6. C: Perhaps IEEE 802.3 can come to our July 2018 meeting and present some more material.
    7. C: I think that the data rate mentioned in document 11-18-0738r0 is too high.
    8. Chair: I’ll possibly create a forum to discuss this further in July 2018.
11. **Adrian Stephens Recognition** (11-18-0892r0)
    1. Chair: I’d like to invite Adrian Stephens (the ex-IEEE 802.11 chair) to make his presentation.
    2. Adrian Stephens: Presented some topics regarding the IEEE 802.11 chair position.
    3. Chair: I like to welcome Tina Stephens as a special quest to this meeting and I would like to thank her.
    4. Many other people then spoke positively about Adrian.
12. **Any Other Business**
    1. Chair: Once we recess, we will have a continued award ceremony for Adrian Stephens the ex-chair of the IEEE 802.11 Working Group
    2. Meeting recessed at 11:56 CET

**Friday, 11th May 2018**

**IEEE 802.11 Closing Plenary**

Call to order at 08:01 CET by Dorothy Stanley (HPE).

73 people present in the room.

1. **Approve/modify working group agenda** (11-18-0622r5)
   1. Chair: There have been some minor changes to the agenda from earlier this week.
   2. Q: Regarding the Ethernet Cabling group, why is this an ad-hoc and not a TIG?
   3. Chair: It’s because the scope is very narrow and its lifetime is very short. The ad-hoc is for lighter weight topics. I think that a TIG could lead to the formation of a study group and this topic does not intend to do that.
   4. **Approve the agenda for the Friday meeting as shown in 11-18-0622r5**
      1. Moved: Stephen McCann, 2nd: Adrian Stephens
      2. No objection to approving by unanimous consent.
2. **Announcements** (11-18-0624r3)
   1. **Participation**
      1. Please can you remember to read this slide and understand that everyone is here as an individual subject matter expert.
   2. **Chair’s minutes, reports and web pages**
      1. Please can you ensure that the sub-group minutes are on the server within 30 days after the close of this meeting. Please can you also send web-page and timeline updates to the secretary.
      2. Please be aware of the Chair’s schedule for the chair’s committee meetings (CAC), which are on 4th June and 2nd July at noon ET.
   3. **Letters of Assurance (LoA)** (slide #16)
      1. Chair: please remember about the LoA requirements.
      2. There is one open LoA request regarding 802.11ax sent to Siemens
   4. **IEEE Store and ISO SCG** (slides #17 and #18)
      1. No questions
      2. Q: I believe REVmd D1.0 is also available now.
      3. Chair: Yes, that it correct and it will be added to the slide.
   5. **Press Releases** (slide #19)
      1. The slide summarizes the recent IEEE 802.11 related press releases.
3. **Call for Essential Patents** (11-18-0624r3 slide #14)
   1. Call for Essential Patents and Letters of Assurance (LoA)
   2. No statements
   3. No questions
4. **Current Venues** (11-18-0613r2 slide #20)
   1. **Straw Poll: How many people would like to come back to this venue?**
   2. Y: 61, N: 1
   3. **How many people enjoyed the social?** 31
   4. **Did not**: 0
   5. **How many people did not attend the social?** 13
5. **Upcoming Venues** (11-18-0613r2 slides #21 and #22)
   1. VC1: This slide shows the future wireless interim and also IEEE 802 plenary locations.
   2. C: Please book the hotels for Vienna very early, as this is a busy time in Vienna for Bach music recitals.
   3. VC1: There is not specific hotel for the Vienna meeting, so there will be a selection of hotels available. There are 3 within a short walking distance.
6. **Treasury Report** (11-18-0615r0)
   1. VC1: This is the treasurer’s report for May 2018. Hopefully this budget will break even this week.
7. **Timelines**
   1. There is a timeline update for TGaq and TGaz. It will be updated over the weekend.
8. **Documentation & Attendance** (11-18-0651r1 slide #3)
   1. These are the usual attendance statistics for this week and IEEE 802.11ax is by far the largest project this week, although IEEE 802.11ba is close behind.
   2. The number of document uploads per meeting is quite steady, although the current trend is a slow decrease.
9. **WG Committee Reports** (11-18-0651r1)
   1. **Technical editor** (slide #6)
      1. No questions
   2. **AANI Standing Committee** (slide #11)
      1. No questions
   3. **ARC Standing Committee** (slide #16)
      1. Q: Is there a liaison with IEEE 1588?
      2. A: Not directly, as our connection to that project is through IEEE 802.1AS (Time Sensitive Networking) but there has not been any communication this week.
   4. **COEX Standing Committee** (slide #22)
      1. No questions
   5. **WNG** **Standing Committee** (slide #26)
      1. There were 5 presentations this week in 2 meeting slots.
      2. No questions
   6. **JTC1** **Standing Committee** (slide #30)
      1. No questions
   7. **TGmd** (slide #36)
      1. No questions.
   8. **TGax** (slide #39)
      1. No questions
   9. **TGay** (slide #44)
      1. No questions
   10. **TGaz** (slide #49)
       1. No questions
   11. **TGba** (slide #54)
       1. No questions
   12. **BCS (Broadcast Services) TIG/SG** (slide #60)
       1. No questions
   13. **FD (Full Duplex) TIG** (slide #69)
       1. No questions
   14. **LC (Light Communications) SG** (slide #73)
       1. No questions
   15. **NGV (Next Generation V2X) SG** (slide #76)
       1. A draft PAR and CDS have been started in documents 11-18-0861r0 and 11-18-0862r0
       2. No questions
10. **Liaison Reports**
    1. **IEEE 802.18** (11-18-0984r0)
       1. Q: regarding slide #3, will 802.18 work on the 802.11ax related issues?
       2. A: Yes, it’s to provide input material to IEEE 802.19.
       3. C: ok, I’d like to understand some more as it will affect 802.11ax.
       4. C: I’ll inform 802.11ax of any progress or teleconference
       5. C: In addition, 802.15.4z is also looking at 802.11 co-existence issues.
    2. **IEEE 802.19** (11-18-0985r0)
       1. C: Regarding reciprocal credits, this only works for existing IEEE 802.11 voters, not aspirants.
    3. **IEEE 802.24**
       1. There were 2 sessions this week as the IoT group does not meet during wireless interims.
       2. Worked on draft liaisons to external entities, that will be ratified in the July 2018 meeting.
       3. ENDECA and complimentary relationship between them and 802.24
       4. Sub 1 GHz co-existence issue that was mentioned in the 802.19 liaison report.
11. **Working Group Motions (Old Business)** (11-18-0650r0)
    1. **Officer Confirmation** (slide #6)

|  |  |  |  |
| --- | --- | --- | --- |
| **Cat** | **Group** | **Chair** | **Vice Chair** |
| SC | AANI | Joseph LEVY |  |
| SC | ARC | Mark HAMILTON | Joseph LEVY |
| SC | Coex | Andrew MYLES |  |
| SC | PAR | Jon ROSDAHL | Michael MONTEMURRO |
| SC | WNG | Jim LANSFORD | Lei WANG |
| TG | MD | Dorothy STANLEY | Mark HAMILTON  Michael MONTEMURRO |
| TG | AK | Donald EASTLAKE | Mark HAMILTON |
| TG | AQ | Stephen MCCANN | Yunsong YANG |
| TG | AX | Osama ABOUL-MAGD | Alfred ASTERJADHI  Ron PORAT |
| TG | AY | Edward AU | Sang KIM |
| TG | AZ | Jonathan SEGEV |  |
| TG | BA | Minyoung PARK | Yunsong YANG  Eunsung PARK |
| SG | BCS | Marc EMMELMANN | Hitoshi MORIOKA  Stephen MCCANN |
| TIG | FD | James GILB |  |
| SG | LC | Nikola SERAFIMOVSKI | Qiang (John) LI |
| SG | NGV | Bo SUN | Hongyuan ZHANG |

* + 1. Moved: Stephen McCann, Second: Jim Lansford
    2. No objection to approving by unanimous consent.
  1. **Liaison Officers** (slide #7)
     1. **Confirm**
     2. **Peter Yee as liaison to IETF**
     3. **Tuncer Baykas as liaison to 802.19**
     4. Moved: Andrew Myles, Second: Guido Hiertz
     5. No objection to approving by unanimous consent.
  2. **Teleconferences** (slide #10)
     1. **Move to approve the following teleconferences**

|  |  |  |  |
| --- | --- | --- | --- |
| **Group** | **Date(s)** | **Start** | **Duration** |
| **CAC** | **Mondays: June 4, July 2** | **Noon ET** | **1 hr** |
| **TGmd** | **Fridays: May 25, June 1, June 15, 22** | **10:00 ET** | **2 hr** |
| **ARC** | **Thursdays May 24, June 21** | **Noon ET** | **1.5 hrs** |
| **TGax** | **Note: as needed, 10 day notice** | **20:00 ET**  **10:00 ET** | **2 hrs**  **2 hrs** |
| **TGay** | **Wednesdays: May 16, 23, 30, June 6, 13, 20, 27** | **10:00 ET** | **1.5 hrs** |
| **TGaz** | **Wednesday: June 13** | **11:00 ET** | **1 hr** |
| **TGba** | **May 21**  **June 4**  **June 18** | **10:00 ET**  **17:00 ET**  **23:00 ET** | **1 hr**  **1 hr**  **1 hr** |
| **NGV** | **June 12** | **20:00 ET** | **2 hr** |
| **BCS** | **Tuesdays: May 29, June 19, July 3, 17, 24**  **Note: Telcos on May 15 and 22 approved at the last meeting** | **10:00 ET** | **1 hr** |

* + 1. Moved: Marc Emmelmann, 2nd: Jonathan Segev
    2. No objection to approving by unanimous consent.
  1. **COEX SC** (slide #9)
     1. **The IEEE 802.11 WG approves the material in 11-18-0708-04 as a LS to ETSI BRAN that endorses adaptivity refinements in EN 301 893**
     2. **[Note: the text in 11-18-0708-04 is the same as approved by the SC with a reference added to TR 36.889 as directed by the SC]**
     3. Moved: Andrew Myles on behalf of the COEX SC, 2nd: Assaf Kasher
     4. For: 37, Against: 0, Abstain: 13 (Motion passes)
  2. **JTC1 SC** (slide #10)
     1. **IEEE 802.11 WG requests IEEE 802 EC approval to forward the comment responses in 11-18-0691-02 to ISO/IEC JTC1/SC6, as responses to the comments received on the recent FDIS ballot on IEEE 802.11-2016**
     2. Moved: Andrew Myles, 2nd: Jim Petronvich
     3. C: Is this the same version of the document as reviewed in REVmd?
     4. A: No, it’s not. I changed one of the comment resolutions from “Reject” to “Revised” in this revision.
     5. For: 30, Against: 0, Abstain: 10 (Motion passes)
     6. Q: What does Revised mean from a process point of view?
     7. Chair: Let’s discuss this later please?
  3. **TGmd** (slide #11)
     1. **Approve a TGmd ad-hoc meeting July 31, August 1-2, 2018 in Portland Oregon, USA for the purposes of LB232 comment resolution and consideration of document submissions**
     2. **[TGmd result: moved: Emily Qi, seconded: Michael Montemurro, result: 9-0-0 Passes]**
     3. Moved: Stephen Palm, Seconded: Menzo Wentink
     4. No objection to approving by unanimous consent.
  4. **TGaj** (slide #12)
     1. **Approve the IEEE 802.11aj September 2017 meeting minutes in 11-17/1484r0 and TGaj November 9, 2017 conference call meeting minutes in 11-17/1782r0**
     2. Moved: Jiamin Chen, Seconded: Jon Rosdahl
     3. No objection to approving by unanimous consent.
  5. **TGax** (slide #13)
     1. **Move to Adopt 11-16/1348r3 as the coexistence assurance document for 802.11ax amendment.**
     2. **[TGax result: Moved: Bin Tian, Second: Laurent Cariou, Y/N/A: 35/0/7]**
     3. Moved: Stephen McCann, Seconded: Bin Tian
     4. For: 41, Against: 0, Abstain: 6 (Motion passes)
  6. **TGax** (slide #14)
     1. **Believing that the PAR extension contained in the document referenced below meets IEEE-SA guidelines,**
     2. **Request that the PAR extension contained in https://mentor.ieee.org/802.11/dcn/18/11-18-0870-00-00ax-tgax-par-extension-request.docx be posted to the IEEE 802 Executive Committee (EC) agenda for WG 802 preview and EC approval to submit to NesCom.**
     3. **[TGax vote: moved:  Stuart Kerry, seconded: Al Petrick, result: y/n/a 38/0/0]**
     4. Moved by Osama Aboul-Magd on behalf of TGax; 2nd: Stephen Palm
     5. For: 54, Against: 0, Abstain: 2 (Motion passes)
     6. C: I understand that another motion is also required for the CSD document.
     7. Chair: Yes, that motion will appear later.
  7. **TGax** (slide #15)
     1. **Having approved changes to TGax draft D2.0, as defined in 11-17/1682r10 in addition to motions passed during May 2018 session,**
     2. **Instruct the editor to prepare TGax draft D3.0, and**
     3. **Approve a 30 day Working Group Technical Letter Ballot asking the question “Should TGax draft D3.0 be forwarded to Sponsor Ballot?”**
     4. [TGax vote: Moved: Robert Stacey, Seconded: Abhishek Patil, Result: 35/0/0]
     5. Moved: Osama Aboul-Magd on behalf of TGax
     6. For: 56, Against: 0, Abstain: 2 (Motion passes)
  8. **TGax** (slide #16)
     1. **Reaffirm the CSD document 11-14-0169r1.**
     2. Moved by Stuart Kerry, 2nd: Al Petrick
     3. For: 50, Against: 0, Abstain: 0 (Motion passes)
  9. **ECR Ad-hoc formation** (slide #16)
     1. **Approve formation of an ad-hoc to consider Ethernet cabling requirements (ECR) for 802.11 systems for the next 5 to 10 years.**
     2. Moved: Guido Hiertz, Second: George Calcev
     3. Chair: Please note that this ad-hoc is not for the next 5 to 10 years but is short term. Osama Aboul-Magd has volunteered to chair this ad-hoc.
     4. For: 41, Against: 0, Abstain: 3 (Motion passes)

1. **Working Group Motions (New Business)** (11-18-0650r1)
   1. Chair: would you like to have a break now?
   2. The preference is to carry on.
2. **Coffee Break**
   1. Chair: would you like to have a break now?
   2. The preference is to carry on.
3. **Extreme throughput (XT)** (11-18-0991r1)
   1. VC1: Whenever new ideas appear, a study group (SG) is defined to do work on that idea. In addition, there is also a technical interest group (TIG), which is designed to prepare material for a study group. Slide #3 shows the best possible timeline for a new idea starting this week.
   2. VC1: Therefore creating a study group in an interim is not useful, as that study group has to wait for approval at the next EC meeting in the next plenary. Then, you have to take into account how many times the EC will allow a study group to be extended.
   3. VC1: I feel that the next agenda item is not in order in this interim meeting and a TIG should be considered instead.
   4. C: Please can we look at the text from the WNG meeting on slide #4
   5. Chair: Yes, we can do that. I would like to have 10 minutes of discussion on this issue
   6. C: I don’t like to term “Extreme” for a study group and prefer another term.
   7. C: During the WNG meeting, the straw poll shows overwhelming support for a study group.
   8. C: I support this idea of starting this process, however the straw poll text is very ambiguous. Therefore, I suggest that a TIG is formed to consider this in more detail and the straw poll text should be re-considered.
   9. C: I also support this activity, but I don’t think the text on the screen forms a suitable motion which can go before the EC. It needs a lot of work and the TIG is the best way ahead.
   10. C: A lot of time has been spent on this topic and this text is result from those discussions.
   11. C: It looks as though there are two processes that we are trying to sort out here; so perhaps we should sort out the agenda.
       1. **Move to modify the agenda to consider the TIG item first.**
       2. Moved: Adrian Stephens, 2nd: Marc Emmelmann
       3. No objection to approving by unanimous consent
   12. C: I would like to see motions on the screen.
   13. Chair: Point taken
       1. **Approve formation of an XT TIG to initiate discussion on new 802.11 features for bands between 1 and 7.125 GHz:**

**with the primary objective to increase peak throughput**

**candidate features include: 320 MHz bandwidth, multiband aggregation and operation, and 16 spatial streams, as described in https://mentor.ieee.org/802.11/dcn/18/11-18-0789-10-0wng-extreme-throughput-802-11.pptx.**

**To support high throughput applications such as video-over-WLAN, AR and VR)**

* + 1. Moved: Jon Rosdahl, Seconded: Jonathan Segev
    2. C: I’d like to speak in favour of the motion. I’m not concerned about the TIG name and “XT” should not mean anything. The text of this motion comes out of the WNG straw poll text, excepting some items which don’t make sense. Additionally the TIG can report that a study group should be formed.
    3. C: I would also like to support this motion. A TIG will also allow other views and features to be considered.
    4. C: I speak against the motion, as I’m not sure that the 82 people from the WNG strawpoll were thinking. I’d prefer to see the WNG text in this motion.
    5. C: I speak in favour of this TIG, as it will help us work on the WNG text.
    6. C: I would like to amend the motion to the WNG straw poll text.
    7. Chair: Please note that substitute motions are not allowed. It should be an amendment to the motion that is on the floor.
       1. **Motion to amend (amendment shown in RED)**

**Approve formation of an XT TIG to initiate discussion on new 802.11 features for bands between 1 and 7.125 GHz:**

**with the primary objective to increase peak throughput**

**candidate features include but are not limited to: 320 MHz bandwidth, multiband aggregation and operation, and 16 spatial streams, as described in https://mentor.ieee.org/802.11/dcn/18/11-18-0789-10-0wng-extreme-throughput-802-11.pptx.**

**To support high throughput applications such as video-over-WLAN, AR and VR**

* + - 1. Moved: Edward Au, 2nd: Bill Carney
      2. C: I think that the new words don’t mean anything. Therefore it doesn’t matter if we approve or disapprove this amendment.
      3. C: I would like to ask the mover of this motion, if he is happy with the text.
      4. C: I speak for the amendment, but would like to add some more changes please.
      5. Chair: Please wait until this motion to amend is complete.
      6. For: 38, Against: 0, Abstain: 6 (Motion passes)
    1. Back to the main motion:
    2. **Approve formation of an XT TIG to initiate discussion on new 802.11 features for bands between 1 and 7.125 GHz:**

**with the primary objective to increase peak throughput**

**candidate features include but are not limited to: 320 MHz bandwidth, multiband aggregation and operation, and 16 spatial streams, as described in https://mentor.ieee.org/802.11/dcn/18/11-18-0789-10-0wng-extreme-throughput-802-11.pptx.**

**To support high throughput applications such as video-over-WLAN, AR and VR**

* + 1. C: I’d prefer to add something to state a specific output to this motion.
    2. Chair: Yes, that’s reasonable.
    3. C: I’d like to add an item to this motion regarding speeding up the process
    4. C: I’d like to speak in favor of the main motion, although the motion does not include any description of procedure. I think that any process discussion is not in scope of this TIG.
    5. C: I speak against the motion, as there are several things happening at the same time. This appears to be a short term technical topic about peak throughput. I think this motion should be forming a forum for a more general debate. Since, we’re having so much debate now, it shows that the motion is not clear.
    6. C: I don’t like the word “Extreme” as it can mean bad or low as well as good and fast. I also think that there is a mobile operator in New Zealand with a similar name to “XT”
    7. Chair: Is there any objection to changing the name to Extreme High Throughput (EHT)
    8. No objection
    9. **Call the question**
    10. No objection
    11. For: 48, Against: 3, Abstain: 3 (Motion passes)
    12. Chair: If you are interested in being a chair for this group, please let me know
    13. Q: Will this group overlap any of the other groups?
    14. Chair: I’ll try and carefully consider the times of this group’s meetings
    15. Chair: The earlier agenda change means that we still have the XT Study Group formation as the next item. I recommend that we remove this item.
    16. No objection

1. **Next Meeting** (11-18-0624r3 slide #21)
   1. The next meeting is at the Manchester Hyatt Regency, San Diego, USA from 9th – 13th July 2018. Registration is now open for this meeting and please note the new type of web-page. The deadline for early bird reservations is May 25th, 2018.
   2. There will be an IEEE 802 Wireless Chairs meeting, as shown in slide #20, on Sunday at 16:00 local time at the July 2018 meeting. This is an open meeting and everyone is welcome.
2. **AoB:**
   1. **ISO comment revision**
   2. C: Regarding the change to the comment for the ISO comments (see above), this will arrive in TGmd. ISO cannot maintain the standard, so it is for 802.11 to do the change.
   3. **Process and Procedures**
   4. C: I would like to suggest that a forum for P&P be formed regarding the TIG/SG debate we have just had and I’m willing (Stuart Kerry) to chair such a group.
   5. Chair: Thank you and I shall certainly consider such a meeting.
   6. **Adrian Stephens**
   7. C: I would like to thank Adrian again, as this is his last meeting
   8. Adrian: I would also like to thank Dorothy for completing her first week of meetings
3. **Adjournment**
   1. Chair: Having completed the agenda, the chair announced that the meeting was adjourned at 10.55 CET.

**Annex A: Attendance & Affiliation**

| **Name** | **Affiliation** | **Attended >= 75%?** | **Status** |
| --- | --- | --- | --- |
| Abouelseoud, Mohamed | Sony Corporation | Yes | Voter |
| Aboulmagd, Osama | Huawei Technologies Co. Ltd | Yes | Voter |
| Adachi, Tomoko | TOSHIBA Corporation | Yes | Voter |
| Ahn, Jinsoo | Yonsei University | Yes | Voter |
| Ahn, Woojin | WILUS | Yes | Voter |
| Alex, Sam | Facebook | No | Non-Voter |
| Andersdotter, Amelia | Article 19 | Yes | Voter |
| Ansley, Carol | ARRIS Group | Yes | Voter |
| Asterjadhi, Alfred | Qualcomm Incorporated | Yes | Voter |
| Au, Kwok Shum | Huawei Technologies Co. Ltd | Yes | Voter |
| Avital, Ziv | Intel Corporation | No | Non-Voter |
| Awater, Geert | Qualcomm Incorporated | Yes | Voter |
| Azizi, Shahrnaz | Intel Corporation | Yes | Voter |
| Baeten, Robert | Qorvo | Yes | Voter |
| bang, saehee | LG ELECTRONICS | No | Non-Voter |
| baron, stephane | Canon Research Centre France | Yes | Voter |
| Batra, Anuj | Apple, Inc. | Yes | Voter |
| Baykas, Tuncer | Istanbul Medipol University | No | Potential Voter |
| Bei, Jianwei | Marvell Semiconductor, Inc. | Yes | Voter |
| Berens, Friedbert | FBConsulting Sarl | Yes | Voter |
| Bhandaru, Nehru | Broadcom Corporation | Yes | Voter |
| Bober, Lennert | Fraunhofer Heinrich Hertz Institute | No | Non-Voter |
| Bolotin, Ilya | Intel | Yes | Potential Voter |
| Bourdoux, Andre | IMEC | Yes | Potential Voter |
| Bredewoud, Albert | Broadcom Corporation | Yes | Potential Voter |
| Calcev, George | Huawei R&D USA | Yes | Voter |
| Cariou, Laurent | Intel Corporation | Yes | Voter |
| Carney, William | Sony Corporation | No | Voter |
| Chang, Soo-Young | California State University, Sacramento (CSUS) | No | Voter |
| Chen, Cheng | Intel Corporation | Yes | Voter |
| Chen, Jiamin | HUAWEI | No | Voter |
| Chen, Xiaogang | Intel Corporation | Yes | Voter |
| CHERIAN, GEORGE | Qualcomm Incorporated | Yes | Voter |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. | Yes | Voter |
| Cho, Hangyu | lg electronics | No | Aspirant |
| Choi, Jinsoo | LG ELECTRONICS | Yes | Voter |
| Chu, Liwen | Marvell Semiconductor, Inc. | Yes | Voter |
| Ciochina, Dana | Sony Corporation | Yes | Voter |
| Coffey, John | Realtek Semiconductor Corp. | Yes | Voter |
| Cordeiro, Carlos | Intel Corporation | Yes | Voter |
| Costa, D.Nelson | Peraso Technologies Incorporated | Yes | Voter |
| da Silva, Claudio | Intel Corporation | Yes | Voter |
| Dave, Brajesh | Quantenna Communications, Inc. | Yes | Potential Voter |
| de Vegt, Rolf | Qualcomm Incorporated | Yes | Voter |
| Debergh, Pierre | Orange | Yes | Voter |
| Efrati, Noam | Celeno Communications | Yes | Potential Voter |
| Egashira, Naoto | Advanced Telecommunications Research Institute International (ATR) | Yes | Aspirant |
| Eitan, Alecsander | Qualcomm Incorporated | Yes | Voter |
| Emmelmann, Marc | Self Employed / Koden-TI | Yes | Voter |
| Erceg, Vinko | Broadcom Corporation | Yes | Voter |
| erez, shai | Texas Instruments Incorporated | Yes | Aspirant |
| Fischer, Matthew | Broadcom Corporation | Yes | Voter |
| Gan, Ming | Huawei Technologies Co. Ltd | Yes | Voter |
| Garcia Villegas, Eduard | Universitat Politecnica de Catalyuna (UPC) | Yes | Voter |
| Ghosh, Chittabrata | Intel | Yes | Voter |
| Godbole, sachin | Broadcom Corporation | Yes | Voter |
| Godfrey, Tim | Electric Power Research Institute, Inc. (EPRI) | No | ExOfficio |
| Grigat, Michael | Deutsche Telekom AG | No | Voter |
| Guo, Yuchen | Huawei Technologies Co. Ltd | Yes | Voter |
| Hamilton, Mark | Ruckus Wireless | Yes | Voter |
| HAN, CHONG | pureLiFi | No | Non-Voter |
| HAN, Xiao | Huawei Technologies Co. Ltd | Yes | Voter |
| Hansen, Christopher | Peraso Technologies Incorporated | Yes | Voter |
| Haran, Onn | Autotalks | No | Non-Voter |
| Harkins, Daniel | Aruba Networks, Inc. | Yes | Potential Voter |
| Hartman, Chris | Apple, Inc. | No | Voter |
| Heberling, Allen | Tensorcom, Inc. | Yes | Voter |
| hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) | Yes | Potential Voter |
| Hiertz, Guido | Ericsson AB | Yes | Voter |
| Holcomb, Jay | Itron Inc. | No | ExOfficio |
| Hong, Hanseul | Yonsei University | Yes | Voter |
| Hsu, Chien-Fang | MediaTek Inc. | Yes | Potential Voter |
| Huang, Lei | Panasonic Asia Pacific Pte Ltd. | Yes | Voter |
| Huang, Po-Kai | Intel Corporation | Yes | Voter |
| Inoue, Yasuhiko | Nippon Telegraph and Telephone Corporation (NTT) | Yes | Voter |
| Ishizu, Kentaro | National Institute of Information and Communications Technology (NICT) | Yes | Aspirant |
| Jeffries, Timothy | Huawei R&D USA | Yes | Voter |
| Ji, Chenhe | Huawei Technologies Co., Ltd | Yes | Potential Voter |
| Jin, Liang | Spirent Communications | Yes | Voter |
| JONES, JEFFRUM | Qorvo, Inc. | Yes | Voter |
| Jones, Vincent Knowles IV | Qualcomm Incorporated | Yes | Voter |
| Jungnickel, Volker | Fraunhofer Heinrich Hertz Institute | Yes | Voter |
| Jurczak, Christophe | lucibel | Yes | Voter |
| Karthik, S. G. | SAMSUNG ELECTRONICS | Yes | Aspirant |
| Kasher, Assaf | Qualcomm Incorporated | Yes | Voter |
| Kedem, Oren | Intel Corporation | Yes | Voter |
| Kenney, John | TOYOTA InfoTechnology Center U.S.A. | Yes | Aspirant |
| Kerry, Stuart | OK-Brit | Yes | Voter |
| Kim, Jeongki | LG ELECTRONICS | No | Voter |
| Kim, Jin Min | LG ELECTRONICS | Yes | Voter |
| Kim, Sang Gook | LG ELECTRONICS | Yes | Voter |
| Kim, Suhwook | LG ELECTRONICS | No | Voter |
| Kim, Yongho | Korea National University of Transportation | Yes | Voter |
| Kim, Youhan | Qualcomm Incorporated | Yes | Voter |
| KNECKT, JARKKO | Apple, Inc. | Yes | Voter |
| Kojima, Fumihide | National Institute of Information and Communications Technology (NICT) | No | Non-Voter |
| Lan, Zhou | Broadcom Corporation | Yes | Voter |
| Lansford, James | Qualcomm Incorporated | Yes | Voter |
| Lee, Hyeong Ho | Netvision Telecom Inc. | No | Non-Voter |
| Lee, Wookbong | SAMSUNG | Yes | Voter |
| Leong, Frank | NXP Semiconductors | No | Non-Voter |
| Lepp, James | BlackBerry | Yes | Voter |
| Levy, Joseph | InterDigital, Inc. | Yes | Voter |
| Li, Guoqing | Apple, Inc. | Yes | Voter |
| Li, Qiang | HUAWEI | Yes | Voter |
| Li, Qinghua | Intel Corporation | Yes | Voter |
| Li, Yunbo | Huawei Technologies Co. Ltd | Yes | Voter |
| Liang, dandan | Huawei Technologies Co. Ltd | Yes | Voter |
| Lim, Dong Guk | LG ELECTRONICS | Yes | Voter |
| Lim, Sang-Kyu | Electronics and Telecommunications Research Institute (ETRI) | No | Non-Voter |
| Lin, Wei | Huawei Technologies Co. Ltd | Yes | Voter |
| Lindskog, Erik | Qualcomm Incorporated | Yes | Voter |
| Liu, Jianhan | MediaTek Inc. | Yes | Voter |
| Loc, Peter | Huawei Technologies Co. Ltd | Yes | Voter |
| Lopez, Miguel | Ericsson AB | Yes | Potential Voter |
| Luo, Pengfei | Huawei Technologies Co., Ltd | Yes | Potential Voter |
| Lv, Lily | Huawei Technologies Co. Ltd | Yes | Voter |
| Ma, Mengyao | HUAWEI | Yes | Voter |
| Madan, Nitin | Broadcom Corporation | Yes | Voter |
| Madpuwar, Girish | Broadcom Corporation | Yes | Voter |
| Malinen, Jouni | Qualcomm Incorporated | Yes | Voter |
| Maltsev, Alexander | Intel Corporation | Yes | Voter |
| Marks, Roger | EthAirNet Associates; Huawei | Yes | ExOfficio |
| Mccann, Stephen | BlackBerry | Yes | Voter |
| Mennecke, Ryan | Johns Hopkins University Applied Physics Lab | No | Aspirant |
| Mo, Jianhua | Samsung Research America | Yes | Voter |
| Monajemi, Pooya | Cisco Systems, Inc. | Yes | Voter |
| Montemurro, Michael | Research In Motion Limited | Yes | Voter |
| Morioka, Yuichi | Sony Corporation | Yes | Voter |
| Motozuka, Hiroyuki | Panasonic Corporation | Yes | Voter |
| Murakami, Yutaka | Panasonic Corporation | Yes | Voter |
| Myles, Andrew | Cisco Systems, Inc. | Yes | Voter |
| Nagai, Yukimasa | Mitsubishi Electric Corporation | Yes | Potential Voter |
| Nagakubo, Sakie | Toshiba | No | Non-Voter |
| Nejatian, Alireza | Ericsson AB | No | Non-Voter |
| Nezou, Patrice | Canon Research Centre France | Yes | Voter |
| Noh, Yujin | Newracom Inc. | Yes | Voter |
| Oh, Minseok | Kyonggi University | Yes | Voter |
| Olaziregi, Nikolas | Nokia | Yes | Aspirant |
| Oteri, Oghenekome | InterDigital, Inc. | Yes | Voter |
| Palm, Stephen | Broadcom Corporation | Yes | Voter |
| Papilion, Zachary | eero, inc. | Yes | Aspirant |
| Park, Eunsung | LG Electronics | Yes | Voter |
| Park, Minyoung | Samsung Semiconductor Inc. | Yes | Voter |
| Park, Sung-jin | LG ELECTRONICS | No | Voter |
| Patil, Abhishek | Qualcomm Incorporated | Yes | Voter |
| Petranovich, James | ViaSat, Inc. | Yes | Voter |
| petrick, Albert | Jones-Petrick and Associates, LLC. | Yes | Voter |
| porat, ron | Broadcom Corporation | No | Voter |
| Pulikkoonattu, Rethnakaran | Broadcom Corporation | Yes | Voter |
| Putta, Satish | visteon | No | Non-Voter |
| Qi, Emily | Intel Corporation | Yes | Voter |
| Rakanovic, Demir | u-blox | No | Voter |
| Rantala, Enrico-Henrik | Nokia | Yes | Voter |
| Rosdahl, Jon | Qualcomm Technologies, Inc. | Yes | Voter |
| Ryu, Kiseon | LG ELECTRONICS | No | Voter |
| Sadeghi, Bahareh | Intel Corporation | Yes | Voter |
| Sahin, Onur | InterDigital, Inc. | No | Non-Voter |
| Sakoda, Kazuyuki | Sony Corporation | Yes | Voter |
| Sambasivan, Sam | AT&T | Yes | Voter |
| Sand, Stephan | German Aerospace Center (DLR) | Yes | Aspirant |
| Sark, Vladica | IHP GmbH | Yes | Potential Voter |
| Sarris, Ioannis | u-blox | Yes | Aspirant |
| Schelstraete, Sigurd | Quantenna Communications, Inc. | Yes | Voter |
| Segev, Jonathan | Intel Corporation | Yes | Voter |
| Seok, Yongho | MediaTek Inc. | Yes | Voter |
| Serafimovski, Nikola | pureLiFi | Yes | Aspirant |
| Shellhammer, Stephen | Qualcomm Incorporated | No | ExOfficio |
| Shilo, Shimi | Huawei Technologies Co., Ltd | Yes | Voter |
| Smith, Graham | SR Technologies | Yes | Voter |
| Solanki, Pritesh | LitePoint Corporation | No | Non-Voter |
| Srinivasa, Sudhir | Marvell Semiconductor, Inc. | Yes | Voter |
| Stacey, Robert | Intel Corporation | Yes | Voter |
| Stanley, Dorothy | Hewlett Packard Enterprise | Yes | Voter |
| Stavridis, Athanasios | Ericsson AB | Yes | Aspirant |
| Stephens, Adrian | Self | Yes | Voter |
| Suh, JUNG HOON | Huawei Technologies Co. Ltd | Yes | Voter |
| Sumi, Takenori | Mitsubishi Electric Corporation | Yes | Voter |
| Sun, Li-Hsiang | InterDigital, Inc. | Yes | Voter |
| Sundman, Dennis | Ericsson AB | Yes | Voter |
| Takai, Mineo | Space-Time Engineering | Yes | Voter |
| Tanaka, Yusuke | Sony Corporation | Yes | Voter |
| Taneja, Mukesh | Cisco Systems, Inc. | Yes | Voter |
| Tarighat, Alireza | Facebook | Yes | Aspirant |
| Tian, Bin | Qualcomm Incorporated | Yes | Voter |
| Tong, Fei | SAMSUNG | Yes | Voter |
| Torab, Payam | Facebook | No | Voter |
| Trainin, Solomon | Qualcomm Incorporated | Yes | Voter |
| Tsodik, Genadiy | Huawei Technologies Co. Ltd | Yes | Voter |
| Ungan, Tolgay | endiio GmbH | Yes | Aspirant |
| Urabe, Yoshio | Panasonic Corporation | Yes | Voter |
| Van Nee, Richard | Qualcomm Incorporated | Yes | Voter |
| Van Thillo, Wim | IMEC | Yes | Aspirant |
| Van Zelst, Allert | Qualcomm Incorporated | Yes | Voter |
| Vanthournout, Jerome | CEVA-DSP | Yes | Voter |
| Varshney, Prabodh | Nokia | Yes | Voter |
| Venkatesan, Ganesh | Intel Corporation | Yes | Voter |
| Verma, Lochan | Qualcomm Incorporated | Yes | Voter |
| Vermani, Sameer | Qualcomm Incorporated | Yes | Voter |
| Wang, Huizhao | Quantenna Communications, Inc. | Yes | Voter |
| Wang, James June | MediaTek Inc. | Yes | Voter |
| Wang, Lei | Huawei R&D USA | Yes | Voter |
| Wang, Qi | Apple, Inc. | Yes | Potential Voter |
| Wang, Xiaofei | InterDigital, Inc. | Yes | Voter |
| Wang, Xuehuan | Huawei Technologies Co. Ltd | Yes | Voter |
| Ward, Lisa | Rohde & Schwarz | Yes | Voter |
| Wentink, Menzo | Qualcomm Incorporated | Yes | Voter |
| Wilhelmsson, Leif | Ericsson AB | Yes | Voter |
| Wolf, Andreas | Dr. Wolf Wireless GmbH | No | Non-Voter |
| Wu, Tianyu | Samsung Electronics Co., Ltd. | Yes | Voter |
| Xin, Yan | Huawei Technologies Co. Ltd | Yes | Voter |
| Xu, Mingguang | Apple, Inc. | Yes | Potential Voter |
| YAGHOOBI, HASSAN | Intel Corporation | Yes | Potential Voter |
| YANG, RUI | InterDigital, Inc. | Yes | Voter |
| Yang, Xun | Huawei Technologies Co. Ltd | Yes | Voter |
| Yang, Yunsong | Huawei Technologies Co. Ltd | Yes | Voter |
| Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) | Yes | Voter |
| Yee, James | MediaTek Inc. | Yes | Voter |
| Yee, Peter | NSA-Cybersecurity | Yes | Voter |
| Yong, Su Khiong | Apple, Inc. | No | Voter |
| Yu, Jian | Huawei Technologies Co. Ltd | Yes | Voter |
| Zhang, Hongyuan | Marvell Semiconductor, Inc. | Yes | Voter |
| Zhang, Yan | Marvell Semiconductor, Inc. | Yes | Voter |
| Zhu, Chunhui | Huawei Technologies Co. Ltd | Yes | Potential Voter |
| Zhuo, Lan | CESI Group | Yes | Voter |
| Zuniga, Juan Carlos | SIGFOX | Yes | Aspirant |

**Annex B : Working Group Officers**

**Working Group**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Dorothy Stanley (HP Enterprise) | IEEE 802.11 Working Group Chair | +1( 630) 363-1389  [dstanley@ieee.org](mailto:dstanley@ieee.org) |
| Jon Rosdahl (Qualcomm) | 1st Vice Chair (Venues and meeting planning) Treasurer | +1 (801) 492-4023 [jrosdahl@ieee.org](mailto:jrosdahl@ieee.org) |
| Robert Stacey (Intel Corporation) | 2nd Vice Chair (Rules and reflectors) IEEE 802 (LMSC) EC delegate | +1 (503) 712 4447 [robert.stacey@intel.com](mailto:robert.stacey@intel.com) |
| Stephen McCann (Blackberry Ltd.) | Secretary | +44 1753 667099 [stephen.mccann@ieee.org](mailto:stephen.mccann@ieee.org) |
| Peter Ecclesine (Cisco Systems, Inc.) | Co-Technical Editor | +1 (408) 710-3403 [petere@ieee.org](mailto:petere@ieee.org) |
| Robert Stacey (Intel Corporation) | Co-Technical Editor 802.11 Assigned Numbers Authority | +1 (503) 712 4447 [robert.stacey@intel.com](mailto:robert.stacey@intel.com) |

**Standing Committees**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Jim Lansford (Qualcomm) | Wireless Next Generation (WNG) Chair | +1-719-286-8660 [jim.lansford@ieee.org](mailto:jim.lansford@ieee.org) |
| Joseph Levy  (InterDigital Communications Inc.) | Advanced Access Netowork Interface (AANI) Chair | +1.631.622.4139 [jslevy@ieee.org](mailto:jslevy@ieee.org) |
| Mark Hamilton (Ruckus Wireless) | Architecture (ARC) Chair | +1 (303) 818-8472 [mark.hamilton2152@gmail.com](mailto:mark.hamilton2152@gmail.com) |
| Jon Rosdahl (Qualcomm) | Project Authorization Request (PAR) review Chair | +1 (801) 492-4023 [jrosdahl@ieee.org](mailto:jrosdahl@ieee.org) |
| Andrew Myles (Cisco) | Coexistence Standing Committee Chair | +61 418 656587 [amyles@cisco.com](mailto:amyles@cisco.com) |

**Task Groups**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Jiamin Chen (HiSilicon/Huawei Technologies) | TGaj Chair China Millimeter Wave | +86-10-8282-9532  [Jiamin.chen@mail01.huawei.com](mailto:Jiamin.chen@mail01.huawei.com) |
| Donald Eastlake, 3rd (Huawei Technologies) | TGak Chair General Link | +1 508-333-2270 [d3e3e3@gmail.com](mailto:d3e3e3@gmail.com) |
| Stephen McCann (Blackberry Ltd.) | TGaq Chair Pre-association Discovery | +44 1753 667099 [stephen.mccann@ieee.org](mailto:stephen.mccann@ieee.org) |
| Osama Aboul-Magd (Huawei) | TGax Chair High Efficiency WLAN | +1 (613) 287-1405 [osama.aboulmagd@huawei.com](mailto:osama.aboulmagd@huawei.com) |
| Edward Au (Huawei) | TGay Chair Next Generation 60 GHz (NG60) | +1 773 782 6875  [edwardau@marvell.com](mailto:edwardau@marvell.com) |
| Jonathan Segev (Intel Corporation) | TGaz Chair Next Generation Positioning (NGP) | +972-54-2403587 [jonathan.segev@intel.com](mailto:jonathan.segev@intel.com) |
| Minyoung Park (Samsung Semiconductor Inc.) | TGba Chair Wake-up Radio (WUR) | [mpark.ieee@gmail.com](mailto:mpark.ieee@gmail.com) |
| Nikola Serafimovski (pureLiFi) | TGbbChair Light Communication (LC) | +44 131 516 1816 [nikola.serafimovski@purelifi.com](mailto:nikola.serafimovski@purelifi.com%3E) |
| Dorothy V. Stanley (HPE) | TGmd Chair 802.11 revision project - P802.11REVmd | +1( 630) 363-1389  [dorothy.stanley@hpe.com](mailto:dorothy.stanley@hpe.com) |

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**Study Groups & Topic Interest Groups (TIG)**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Marc Emmelmann (Koden-TI) | Broadcast Services (BCS) Study Group Chair | [marc.emmelmann@me.com](mailto:marc.emmelmann@me.com) |
| Michael Montemurro (Blackberry) | Extremely High Throughput Topic Interest Group Chair | [mmontemurro@blackberry.com](mailto:mmontemurro@blackberry.com) |
| James P. K. Gilb (General Atomics Aeronautical Systems Inc., University of San Diego, Gilb Consulting) | Full Duplex Topic Interest Group Chair | +1 858-229-4822 [Gilb\_IEEE@yahoo.com](mailto:Gilb_IEEE@yahoo.com) |
| Bo Sun (ZTE) | Next Generation V2X  (NGV) Study Group Chair | [sun.bo1@zte.com.cn](mailto:sun.bo1@zte.com.cn) |

**Liaison Officials to non IEEE-802 organizations**

|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Peter Yee (Akayla) | Liaison to IETF (Internet Engineering Task Force) | [peter@akayla.com](mailto:dorothy.stanley@hpe.com) |
| Ian Sherlock (Texas Instruments Inc.) | Liaison to WFA (Wi-Fi Alliance) | +1-972-995-2011 [isherlock@ieee.org](mailto:isherlock@ieee.org) |

**Liaison Officials to IEEE-802 organizations**

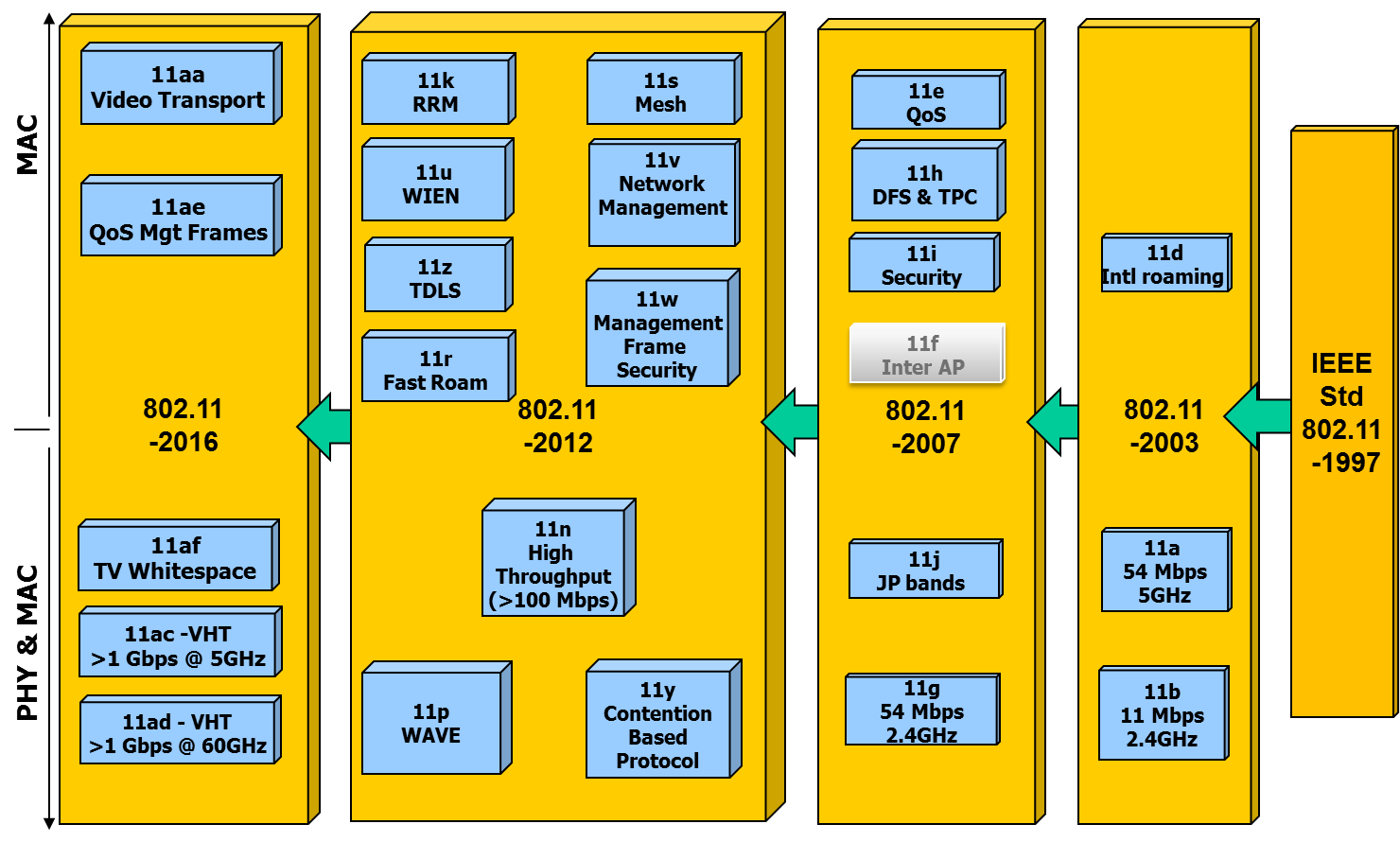
|  |  |  |
| --- | --- | --- |
| Name (Affiliation) | Position | Contact Details |
| Juan-Carlos Zuniga (InterDigital Communications) | Liaison to IEEE 802E | [j.c.zuniga@ieee.org](mailto:j.c.zuniga@ieee.org) |
| Rich Kennedy | Liaison to IEEE 802.18 | +1 (832) 298-1114 [rkennedy1000@gmail.com](mailto:rkennedy1000@gmail.com) |
| Tuncer Baykas (Istanbul Medipol Universitesi) | Liaison to IEEE 802.19 | [tbaykas@ieee.org](mailto:tbaykas@ieee.org) |
| Tim Godfrey (Electric Power Research Institute) | Liaison to IEEE 802.24 | +1 (650) 855-8584 (office) [tim.godfrey@ieee.org](mailto:tim.godfrey@ieee.org) |

**Annex C : Minutes**

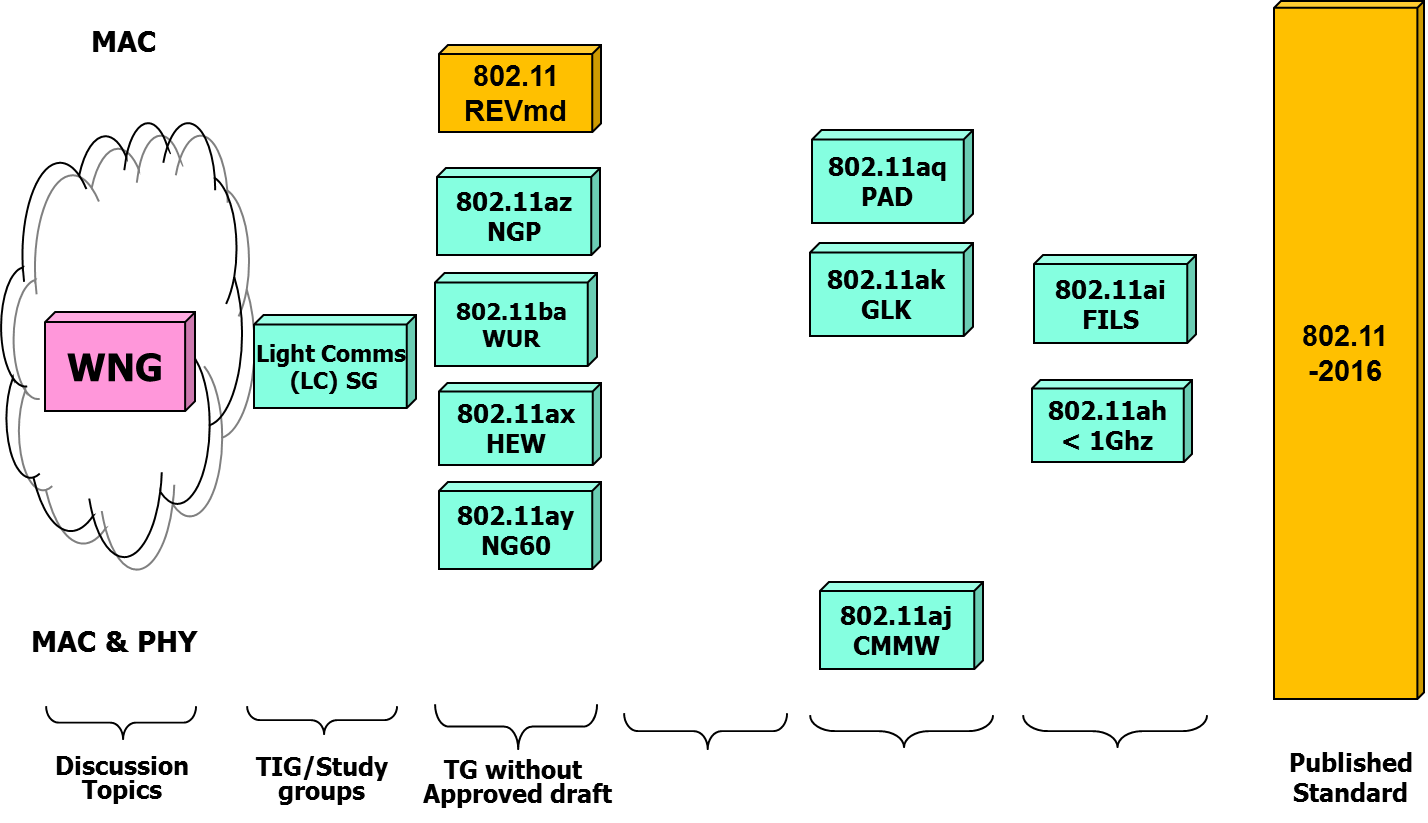
This Annex contains references to all IEEE 802.11 SC/TG/SG & Ad Hoc Committee (AHC) minutes from this meeting. Please note that they are NOT subject to the approval of these minutes, but are confirmed and approved by their individual group in the opening meeting at their next session.

|  |  |  |
| --- | --- | --- |
| WG | TE | 18-0634r0 |
| TGmd | TG | 18-0616r0 |
| TGax | TG | 18-0888r2 |
| TGay | TG | 18-0847r0 |
| TGaz | TG | 18-0926r0 |
| TGba | TG | 18-0999r0 |
| LC | SG | 18-0910r2 |
| WNG | SC | 18-0956r0 |
| ARC | SC | 18-0942r0 |
| JTC 802 | SC | 18-1002r0 |
| AANI | SC | 18-0913r2 |
| COEX | SC | 18-1061r0 |
| FD | TIG | 18-1008r0 |
| NGV | SG | 18-0943r0 |
| BCS | TIG | 18-0901r0 |

**Annex D : Revisions and Standards Pipeline**

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**IEEE 802.11 Revisions**

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**IEEE 802.11 Standards Pipeline**

End.