IEEE P802.11  
Wireless LANs

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| Minutes of the IEEE P802.11 Full Working Group | | | | |
| Date: 2016-01-18 | | | | |
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Abstract

This document constitutes the minutes of the IEEE 802.11 full working group for the January 2016, Atlanta, Georgia, USA meeting.

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

**IEEE 802.11 Interim Meeting – Session #155**

**Hyatt Regency, Atlanta, Georgia, USA**

**January 18th – 22nd, 2016**

**IEEE 802 Wireless Opening Plenary, Monday, 14th January 2016**

**8:08** The 802.11, 802.15, 802.16, 802.18, 802.19, 802.21, and 802.24 Chairs called the joint meeting to order.  IEEE 802.11 attendance is included as Annex A.

General announcements:

·      No photography, no audio recording

·      Social – Reception (courtesy of Hyatt) on Wednesday 18:00 – 19:30

·      Lunch is not provided this session

·      Don’t forget, book your room and register for March’s session

Straw Poll of new attendees: 0

**8:11**   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>).

802.15 WG chair read IEEE anti-trust policy.

**8:15**   Wireless and IMAT announcements by R Alfvin (Verilan) ([15-16-0045-00](https://mentor.ieee.org/802.15/dcn/16/15-16-0045-00-0000-opening-plenary-information-2016.pptx))

**8:17** Financial report by Jon Rosdahl (Qualcomm) docs [11-15-01525-00](https://mentor.ieee.org/802.11/dcn/15/11-15-1525-00-0000-treasurer-report-January-2016.pptx),   
[15-16-0046-00](https://mentor.ieee.org/802.15/dcn/15/15-16-0046-00-0000)

Total liabilities and equity          $665,009.59

**8:20**  WG15 Chair informed the group that the Wireless Chairs Standing Committee (WCSC) met yesterday, Sunday. Chair noted that this is an open meeting, so all interested are encouraged to attend.

·      Wireless Operations Manual was approved (ec-0028-04)

**8:24**   Review future sessions (document # 15-15-0962-03)

·      March 13-18, 2016, Sands Venetian Hotel, Macau, PRC, *802 Plenary Session.*

·      May 15-20, 2016, Hilton Waikoloa Village, Kona, HI, USA, *802 Wireless Interim Session.\**

·      July 24-29, 2016, Grand Hyatt, San Diego, CA, USA, *802 Plenary Session*

·      September 11-16, 2016, Marriott Warsaw, Warsaw, Poland, 802 Wireless Interim Session

·      November 6-11, 2016, Grand Hyatt San Antonio, San Antonio, TX, USA, *802 Plenary Session.*

·      January 15-20, 2017, Hyatt Regency Atlanta, Atlanta, GA, USA, 802 *Wireless Interim Session.\**

·      March 12-17, 2017, Hyatt Regency Vancouver, *802 Plenary Session.*

·      May 13-18, 2017, Daejeon Convention Center, Daejeon, Korea (TBC), *802 Wireless Interim Session.*

·      July 9-14, 2017, Estrel Hotel and Convention Center, Berlin, Germany, 802 Plenary Session.

·      September 10-15,  2017, Hilton Waikoloa Village, Kona, HI, USA, 802 Wireless Interim Session.\*

·      November 5-10, 2017, Caribe Hotel and Convention Center, Orlando, FL, USA, 802 Plenary Session

·      January 14-19, 2018, Hotel Irvine, Irvine, California, 802 Wireless Interim Session.\*

**8:24   Working Group Updates**

* 1. Adrian Stephens (Intel), (document 11-15-1486-00)

·      367 voters

TGmc: Revision mc (REVmc)

TGah: Operation in 900 MHz bands (S1G)

TGai: Fast Initial Link Setup (FILS)

TGaj: China Milli-Meter Wave (CMMW)

TGaq: Pre-association Discovery (PAD)

TGak: General Link (GLK)

TGax: High Efficiency Wireless LAN (HEW)

TGay: Next Generation 60 GHz (NG60)

TGaz: Next Generation Positioning (NGP)

802.15 B Heile (document [15-15-0654-03](https://mentor.ieee.org/802.15/dcn/15/15-15-0654-03-0000-september-2015-802-15-wg-agenda-graphic.xls))

·      103 voters

·      802.15.4 revision is complete (802.15.4-2015)

TG3d: 100G

TG3e: HRCP (High Rate Close Proximity)

TG4n: Chinese Medical Band (CMB) – at RevCom

TG4q: ULP (Ultra Low Power) in WG LB – at RevCom

TG4s: SRU (Spectrum Resource Utilization)

TG4t: High(er) rate amendment

TG4u: India amendment

TG 7r1: Optical Wireless Communications

TG8: PAC (Peer Aware Communications) – finishing draft document

TG9: KMP (Key Management Protocol) – Sponsor Ballot

TG10: L2R (Layer 2 Routing) – finishing WG Letter Ballot

SG12 Upper Layer Interface (ULI) for 802.15.4

IG 6tisch

IG Dependability

IG High Rate Rail Communications

IG THz

IG 15.4 Guide (on hold)

802.18  M  Lynch

·      10 voters

·      ITUR- WRC15 has farmed out efforts to other groups

802.19  S Shellhammer

·      3GPP Liaison – at 802 EC

* Presentations: NIST, ETSI BRAN

·      Coexistence in the Automotive Environment – Interest Group

* Will meet Tuesday this week

802.21  Subir Das

·      22 voting members

·      TG21m – revision project – in Letter Ballot

·      TG21.1 –use cases and services – in Letter Ballot

802.24  Tim Godfrey (24-16-002)

·      Task Groups

* 802.24.1      Smart Grid TG               Tim Godfrey
* 802.24.2      IoT TG                         Chris DiMinico

·      34 voters

·      3 meetings this session

·      802.16 and 802.24 are holding a tutorial on the proposed 802.16s Narrowband Project.  This project aims to amend IEEE 802.16 to provide support for channel sizes narrower than currently specified, to facilitate operations in vertical applications such as Smart Grid.

* The tutorial will be Tuesday evening January 18th at 7:30pm in the Regency V Ballroom

OmniRAN  Max Riegel

·      getting the specification document together

**IEEE 802.11 Opening Plenary, Monday 18th January 2016**

Presiding chair: Adrian Stephens (Intel) opened the meeting at 09:00 Eastern Standard Time (EST)

2nd Vice-chair (VC2): Dorothy Stanley Hewlett Packard Enterprise

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

Secretary: Stephen McCann BlackBerry Ltd

There are 367 voting members and 11\*\* Ex Officio voters of IEEE 802.11

There were 210 people in the room

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

1. **Notices** (11-15-1486r0)
   1. No photographs at this meeting and please turn your mobiles to vibrate. Please note that this slide has been updated regarding members of the press.
2. **Approve/modify joint opening agenda** (11-15-1485r1)
   1. Chair: This is a summary of all room allocations for the week.
   2. Are there any more modifications required at this moment?
   3. None seen
   4. **Motion #1: Move to approve the agenda 11-15-1485r1**
   5. Moved: Al Petrick, 2nd: Jon Rosdahl
   6. No objection, so the agenda is approved by unanimous consent.
   7. Based on our current P&P, the chair announced that this session has quorum.
3. **November 2015 WG Minutes**
   1. **Motion #2: Move to approve the Dallas November 2015 minutes document 11-15-1247r1**
   2. Moved: Stephen McCann, 2nd:Stuart Kerry
   3. Following neither discussion nor dissent the minutes were approved by unanimous consent.
4. **Attendance**
   1. Welcome to the 6 new participants in this meeting.
   2. Chair: Please note that Stephen McCann (Secretary) will be holding a newcomer’s session at 10:30 this morning.
   3. The room is Greenbrier on a lower floor.
5. **Call for essential Patents** (11-15-1527r0)
   1. VC2: read out the current PatCom rules and then called for essential patents information, as shown by:
   2. <http://standards.ieee.org/board/pat/pat-slideset.ppt>
   3. There were no issues raised regarding the call for essential patents. There was no response to the call for essential patents.
   4. VC2: read out other policies and procedures for the meeting.
   5. VC2: There are also several current documents which describe the policies and procedures. Note that there were a few changes made in November 2015.
6. **Announcements**
   1. **Attendance Report (11-16-0025r0)**
      1. VC2: There will be a report about the ongoing attendance issue on Wednesday this week.
   2. **Liaisons (11-15-1486r0 slide #4)**
      1. Chair: There has been a liaison received from 3GPP, which I understand will be dealt with by IEEE 802.19.
      2. IEEE 802.19 chair: This will be dealt with in PM2.
      3. Chair: There is also an ongoing liaison from NGNM and there will be a meeting in PM1 today, to draft a response (from IEEE 802.11).
   3. **Other agendas for this meeting (slide #10)**
      1. Chair: This is information about the other IEEE 802 group meeting logistics for this week. Please note the joint meetings.
      2. C: OmniRAN (IEEE 802.1CF) is also meeting here this week.
   4. **Meetings this week (11-15-1486r0)**
      1. Chair: please look at slide #6 regarding joint meetings and other special events this week. Please also use the mobile app for room allocations.
      2. There will be some regulatory issues during the mid-week plenary this week.
      3. On Friday there will be an EC workshop from 13:00 – 17:00 which is open to everyone.
   5. **Tutorial (11-15-1486r0 slide #7)**
      1. Chair: please note that there is a special IEEE 802.16/IEEE 802.24 tutorial this week on the topic of narrowband transmissions.
   6. **Meeting logistics (11-15-1524r0)**
      1. VC1: this slide deck shows information about future meetings and logistics this week.
   7. **Recording Attendance (slide #10)**
      1. VC1: Please remember to record your attendance for each 2 hour slot during the week.
   8. **WG Documents (slide #11)**
      1. VC1: If you want to synchronize all the documents on mentor, please use the local server and not the external link.
   9. **Social and Catering options (slide #12)**
      1. VC1: Please note that the social this week is being sponsored by the Hyatt hotel itself.
7. **Status of all groups** (11-15-1486r0)
   1. **Sub-Group Status**
      1. Chair: this summarizes all the IEEE 802.11 sub-groups including officers. Mark Hamilton is not here this week, so Joseph Levy will chair the ARC meetings.
      2. There are additionally some changes to secretaries and editors as shown.
      3. Please note that TGaj is currently in letter ballot and REVmc is in re-circulation sponsor ballot. These will finish shortly.
8. **Group Summaries** (11-15-1526r1)
   1. Special notes were mentioned for the following groups:
   2. **Timelines**
      1. No recent changes, but please can all chairs send the secretary any required updates prior to the Thursday evening CAC meeting. Since this is January, it’s a good time for everyone to review their timelines this week.
   3. **Editor’s meeting**
      1. Tomorrow morning at 7.00am, including the ANA status, style guides and numbering situation. The editor position for 11az is currently open.
   4. **ARC**
      1. This week, there will be discussions about IMT 2020 and also “802.11 as a component”.
   5. **PAR**
      1. This group is not meeting this week, but this is a reminder that any upcoming PARs do have deadlines to meet.
   6. **WNG**
      1. There are 2 presentations currently scheduled this week (Tuesday AM1).
   7. **TGmc**
      1. This group has completed comment resolution for the initial sponsor ballot and so REVmc is now out for a re-circulation sponsor ballot. There will be a BRC (Ballot Resolution Committee) meeting in Fort Lauderdale in February 2016.
   8. **TGah**
      1. Chair: Are you expecting any discussion of IP issues within your comment resolutions this week?
      2. Answer (A): yes
      3. Chair: In which case, please can you co-ordinate with myself at that point.
   9. **TGaj**
      1. They are not meeting this week, but will be meeting in China next week. Please note that the 11aj letter ballot is open at the moment.
   10. **TGax**
       1. So far there are 46 presentations for this week. There is now a proposed TG draft, which has been created by the technical edit (11-16-0024r0).
   11. **LRLP (Long Range Low Power) TIG**
       1. There are 3 meetings this week and 7 presentations.
9. **Recess**
   1. Meeting recessed at 10:02 EST.

**Wednesday, 20th January 2016**

**IEEE 802.11 Mid-Week Plenary**

Presiding chair: Adrian Stephens (Intel) opened the meeting at 10:30 EST.

189 people present.

1. **Approve/modify joint opening agenda** (11-15-1485r2)
   1. Chair: There are a couple of minor changes to the agenda about the treasurer’s report and a new item about IMT 2020. Any comments about this.
   2. None seen.
   3. **Motion #3: Move to approve the revised agenda 11-15-1485r3.**
      1. Moved: Jon Rosdahl, 2nd: Al Petrick
      2. No objection to approving the agenda by unanimous consent.
2. **Call for Essential Patents** (11-15-1487 slide #4)
   1. Chair: additionally I would like to point out that these patent slides apply to everyone within the room.
   2. Also the Call for Essential Patents from Monday still applies
   3. No statements from anyone.
3. **CAC**
   1. Reminder about 19.30 EST meeting on Thursday. The purpose of this meeting is to prepare for the Friday closing plenary.
4. **Wi-Fi Alliance Liaison** (11-16-0135r0)
   1. Recent Items of note:
      1. Liaison to IEEE on LTE in unlicensed band coexistence testing
         1. <https://mentor.ieee.org/802.11/dcn/16/11-16-0111-00-0000-liaison-from-wfa-on-laa-coexistence-testing.doc>
      2. Second WFA workshop on LTE-U and Wi-Fi coexistence scheduled on 10th Feb 2016
      3. Wi-Fi Alliance announced the Wi-Fi HaLow™ designation for products incorporating forthcoming IEEE 802.11ah technology
         1. <http://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-introduces-low-power-long-range-wi-fi-halow>
   2. The next member meeting is scheduled for the week of 7th Mar 2016 in Kyoto, Japan.
   3. No questions
5. **IETF Liaison** (11-16-0049r0)
   1. The next IETF meeting is April 3-8, 2016 – Buenos Aires
   2. The report contains various upcoming topics of interest to IEEE 802.11 within the IETF.
   3. No questions
6. **Time slot changes**
   1. Chair: I understand that REG have completed their work for this week. There is now an open slot on Thurs AM1
   2. JTC1 on Thurs PM1 is also free.
   3. TGax is running as a single meeting on Wed PM1 and PM2.
   4. Chair: Are there any requests?
   5. TGaq: Please can a slot be added PM1
   6. Chair: Yes.
   7. **Motion #4: Move to approve the updated agenda 11-15-1485r3**
      1. Moved: Jim Petranovich, 2nd: Stuart Kerry
      2. No objection to approving the agenda by unanimous consent.
7. **Regulatory** (11-16-1537r0)
   1. Chair: I would just like to provide some background to this topic.
   2. An IEEE 802 ad-hoc meeting has been created (for later this week) to define a mission statement for future IEEE 802 regulatory activities, to try and work out what is going to happen with the IEEE 802.18 group and the IEEE 802.11/15 joint regulatory group going forward.
   3. IEEE 802.11/15 Chair Pro-tem: I would like to make this presentation to state the situation from an IEEE 802.11 perspective.
   4. Comment (C): I think that your call to action means that the IEEE 802.11 should work with the Wi-Fi Alliance on this topic. This should be actively pursued.
   5. C: Here within IEEE 802.11, we’re developing 160 MHz bandwidths and yet at the same time, the band allocations for these technologies may not even exist in the future. So is more support required to move this forward.
   6. C: I think that IEEE 802 has been fairly ineffective with regulators compared to the Wi-Fi Alliance. Remember that IEEE 802.18 is supposed to verify output documents from IEEE 802.11, and this process has been very slow. The regulators prefer to here from SDOs as opposed to industry forums.
   7. C: Regulatory should be for technology neutral technology. However, this situation appears to be changing. Additionally, companies don’t have the resources to provide the engineering to look at regulatory issues going forward.
8. **Process** (11-15-01487r0)
   1. Chair: This is just a reminder about process within IEEE 802.11 following some reflections after the November 2015 IEEE 802.11 closing plenary.
   2. The chair is not bound by Robert’s Rules. It is only a guide.
   3. However, the meeting should listen to the will of the body, so the chair can be corrected.
   4. Question (Q): Does this mean that there can be multiple motions in the same session?
   5. Chair: The slide states that it’s up to the members to decide that. Robert’s Rules suggests not, but the will of the group may change this.
   6. C: ok, so there’s a loophole, as this means that a motion can be repeated when certain members are not present at the second occurrence.
   7. C: Indeed, but this sort of behavior can be achieved following Robert’s Rules anyway.
   8. C: The slides discuss working group. Will anything change at the task group or even an ad-hoc group level?
   9. Chair: these are the rules as stated.
   10. C: Ok, but I believe that all these rules should be applied evenly. I think the earlier comment is referring to chairs that wait for opportunistic times to possibly exclude members.
   11. Chair: In that case, I would expect that members could raise an appeal.
9. **Agenda update**
   1. Chair: Is there any objection to updating today’s agenda for an extra item about Macau Logistics?
   2. **Motion #05: Move to approve the updated agenda 11-15-1485r3**
      1. No objection to approving the agenda by unanimous consent.
10. **EC Workshop** (11-15-1487r0)
    1. Chair: There is an open IEEE 802 EC meeting on Friday afternoon, discussing various topics. If you wish to attend you can, although the room space is not too large.
    2. Chair: There is also another IEEE 802 EC meeting on Saturday. However, this meeting is a closed meeting.
    3. No questions
11. **Wi-Fi Alliance workshop** (11-15-1487r0)
    1. Chair: This is a report from a November 2015 workshop held between the IEEE 802.11 officers and the Wi-Fi Alliance representatives.
    2. Q: There are some topics which appear to be at an early stage of discussion. Why was IMT 2020 a topic for this meeting? I think it may have been a little early.
    3. Chair: I think these topics should be mentioned as soon as they appear in the industry. All the activities within IEEE 802.11 are considered in the open.
    4. C: Perhaps the IEEE 802.11 membership should be asked about what topics should be considered going forward, as this workshop was an external event.
    5. Chair: I’ll add a discussion topic on Friday’s agenda.
12. **Attendance rules** (11-16-0025r0)
    1. VC2: Based on a motion from the November 2015 closing plenary, I’ve created this report. It summarizes all the current rules about attendance.
    2. Presentation of VC2 report was made.
    3. Chair: I would like to thank the VC2 for all the hard work put into this report.
    4. Chair: if anyone wishes to discuss this further as a separate topic, please let me know.
13. **IMT 2020** (11-16-0156r0)
    1. This is a report about IMT 2020 discussions this week. This will become an input for the IEEE 802 workshop on Friday, as mentioned earlier in this meeting.
    2. Chair: Would people like a re-run of the straw polls form the report in this group?
    3. Chair: Ok, the not interested have it.
    4. There are now some additional straw polls:
    5. **Slide #15 straw poll:**
    6. C: Regarding item 1), IEEE 802.11 cannot participate within ITU, as it has to be IEEE-SA.
    7. C: There are risks of participating. This should not be done in halfhearted way. For IMT 2000, there was LTE and WiMAX. For IMT 2020, I don’t know if a IEEE 802.11 proposal competing with 3GPP would be of any use.
    8. Chair: We’ll probably run out of time for this discussion, so it can be contnmued on Friday.
    9. Q: from the ARC meeting this week, it doesn’t see that people can make a decision yet.
    10. A: yes, I agree. However, the IEEE 802.11 chair will be asked on Friday, during the EC workshop, how much participation is likely to occur within IEEE 802.11. I would like to ask a further answer of “need more information”.
    11. Q: As previously stated, option 1) is not allowed. So what’s the point of the straw poll?
    12. A: Yes, but I think IEEE 802.11 could be the principle driver of this effort.
    13. Q: But, we have a choice which is not possible.
    14. C: I think that this work should be done and at the moment, I’m not too bothered exactly where it should be done. In addition, we must participate in IMT 2020, as it provides an opportunity for IEEE 802.11 to contribute. If we don’t bother, then IEEE 802.11 may be excluded.
    15. Chair: I would like to observe, that once something starts within an SDO, it’s hard to kill it.
    16. C: It appears that everyone else who involved in IMT 2020, have a different meeting schedule from IEEE 802.11, so that needs to be taken into account.
    17. Chair: so, we have time for the initial straw poll:
    18. **What is the preferred Style of IMT-2020 Participation**
        1. **1. 802.11 directly participates (through IEEE-SA sector membership) in the IMT-2020 process**
        2. **2. 802.11 actively supports an 802 EC standing committee that is participating in the IMT-2020 process**
        3. **3. 802.11 provides requested information to an 802 EC standing committee that is participating in the IMT-2020 process**
        4. **4. 802.11 should not participate in the IMT-2020 process**
        5. **5. Need more information**
    19. Result: 1) 15, 2) 48 , 3) 29, 4) 21, 5) 43
    20. Please note that there are other straw polls which will be run on Friday.
    21. C: Does the presenter plan to come along to the EC workshop on Friday.
    22. A: No, I cannot this time.
14. **Macau Logistics**
    1. Face-to-Face: Please note that travel to Macau is a little complex. A link has just been sent to the IEEE 802.11 mailing reflector. Please note that from Hong Kong a ferry is usually taken. If you arrive in Hong Kong after 6pm, it is recommended that you stay overnight in the city and then take a ferry to Macau the next morning.
    2. Also note that the ferry from Macau to/from Hong Kong international airport is air-side only, so it’s more like an international transfer. Please be aware that this can cause complications, especially when you are returning to Hong Kong. Buy your ferry ticket before you go to the ferry terminal. Most of them can be bought beforehand at various Hong Kong hotels. Additionally, a first class ticket on the ferry is much better. Porter service for bags is cash only.
    3. For the vast majority people, Visas are not required.
    4. Macau does have its own currency, although Hong Kong dollars are accepted.
15. **Any Other Business**
    1. Meeting recessed at 12:28 EST

**Friday, 22nd January 2016**

**IEEE 802.11 Closing Plenary**

Call to order at 08:00 EST by Adrian Stephens (Intel Corporation).

76 people present in the room.

1. **Agenda** (11-15-1485r5)
   1. Chair: There have been some changes due to the addition of extra items which were not presented earlier in the week, for example some new motions.
   2. **Motion #6: adopt the changes to the agenda as shown in 11-15-1485r5**
   3. Moved: Donald Eastlake, 2nd: Jim Lansford
   4. Approved by unanimous consent
2. **Call for Essential Patents**
   1. Call for Essential Patents and Letters of Assurance (LoA)
   2. No statements
   3. No questions
3. **Announcements** (11-15-0986r0)
   1. **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 updates to the secretary.
      2. Please be aware of the Chair’s schedule for the chair’s committee meetings (CAC), which are on February 8th and February 29th 2016.
   2. **Next Meeting**
      1. Chair: The next meeting is in Macau in March 2016.
      2. Please arrange your travel and do your registration.
   3. **Letters of Assurance (LoA)** (11-15-1489r2)
      1. Chair: please remember about the LoA requirements. I have received some updates as shown on the slide.
      2. Q: the slide says 5 companies, but there are only 3 listed.
      3. Chair: Sorry, that’s a mistake, There are only 3.
   4. Q: going back to the LoA slide, you also have a link to the agenda graphic and not the actual document that you mentioned (i.e. 11-15-1489r2)
   5. Chair: I will correct it.
   6. **IEEE Store and ISO SCG** (11-15-1487r1 slide 14)
      1. Chair: Please can everyone review the state of the store.
      2. TGai would like to ask D7.0 to be placed in the store.
      3. TGah would like to ask D6.0 to be placed in the store.
      4. TGmc would like to ask D5.0 to be placed in the store.
      5. TGaq would like to ask D3.0 to be placed in the store.
4. **IEEE 802.11aj letter ballot results** (11-15-1487r1 slide #33)
   1. These are the results of the resent IEEE 802.11aj letter ballot. Please note that the number of comments for this initial letter ballot is rather low.
5. **3GPP LAA**
   1. Chair: I understand that 3GPP will send a representative to the March 2016 (Macau) to make a presentation about LAA. I’ll let you know more information when I find out.
6. **Current Venues** (11-15-1534r0 slide #18)
   1. **Straw Poll: How many people would like to come back to this venue? Y: 33, N: 12**
   2. **No Questions**
7. **Upcoming Venues** (11-15-1524r0 slide #19)
   1. VC1: This slide shows the future interim locations. Other slides show the upcoming plenary sessions.
   2. Q: The IEEE 802.11 web-site was showing a tentative date for the September 2016 meeting earlier in the week.
   3. Chair: The date on the web-site is now correct.
   4. Q: What are the September dates for 2016? They appear to be the same for 2017, so one of them is incorrect.
   5. VC1: just to confirm they are: 11-16 September 2016 (as shown on the web-site page) and 10-15 September 2017.
8. **Treasury Report** (11-15-1525r1)
   1. VC1: This is the treasurer’s report.
   2. This week the budget has been kept as low as possible. The final figures for this week will be available later in the year.
9. **Timeline Chart Update**
   1. Secretary: there is only one small change to the timeline chart this week for TGaq. This will be updated over the next few days.
   2. <http://www.ieee802.org/11/Reports/802.11_Timelines.htm>
   3. No questions
10. **Documentation & Attendance** (11-15-1529r0 slide #5)
    1. These are the usual attendance statistics for this week and IEEE 802.11ax is by far the largest project this week.
    2. Q: What does GAR mean?
    3. A: It means the Greater Americas Region.
11. **WG Committee Reports** (11-15-1529r0)
    1. **Technical editor (slide #7)**
       1. Welcome to Chao Chun Wang as the TGaz editor.
       2. In July 2016, the editors will consider a re-ordering of future amendments.
    2. **ARC Standing Committee** (**slide #13)**
       1. No questions
    3. **IEEE 802.11/15 Regulatory (REG) Standing Committee** (**slide #19)**
       1. No questions
    4. **WNG Standing Committee (slide #24)**
       1. There were two presentations on IMT 2020 this week.
       2. No questions
    5. **JTC1 Standing Committee** (**slide #28)**
       1. No questions
    6. **TGmc (slide #33)**
       1. At the moment, the work should be finished by September 2016. It is possible that it could be as early as June 2016. There will be a face to face BRC meeting in Fort Lauderdale in February 2016.
    7. **TGah (slide #39)**
       1. No questions
    8. **TGai (slide #46)**
       1. TGai will not be meeting at the March 2016 plenary, as they will be in the middle of a sponsor ballot re-circulation.
       2. No questions.
    9. **TGak (slide #57)**
       1. No questions
    10. **TGaq (slide #62)**
        1. No questions
    11. **TGax (slide #65)**
        1. The plan is to produce a D0.1 in March 2016 and then start a comment collection process, so that a D1.0 should be ready for letter ballot in July 2016.
        2. Chair: In the editor’s meeting, 11-16-0035r0 discusses the state of the IEEE 802.11 standard especially about the terms for new STAs. Once suggestion is to separate out new MAC sections as new clauses going forward. I understand that the TGax technical editor has volunteered to try this out with the new MAC features in the 11ax draft. Therefore please can everyone be aware that the structure of the initial 11ax draft may radically change over the next few months.
    12. **TGay (slide #73)**
        1. No questions
    13. **TGaz (slide #79)**
        1. No questions
    14. **Long Range Low Power (LRLP) Topic Interest Group (TIG) (slide #85)**
        1. No questions
    15. **NGNM ad-hoc (slide #90)**
        1. Chair: A report was generated from this meeting. Slide #92 shows the result of various straw polls gauging interest in IEEE 802.11 members participating in this activity.
        2. Chair: Therefore, this activity has finished.
        3. No questions
12. **Liaison Reports**
    1. **IEEE 802.15** (11-16-0197r0)
       1. No questions
    2. **IEEE 802.21** (11-16-0198r0)
       1. No questions
    3. **IEEE 802.18**
       1. This week their work covered:
          1. an output document to the FCC regarding bands above 24 GHz
          2. an input document from IEEE 802.24
          3. WRC ’15 report regarding RLANs.
          4. Early material and preparation plans for WRC ‘19
    4. **IEEE 802.24** (11-15-1529r0 slide #93)
       1. No questions
    5. **IEEE 802.1CF OmniRAN** (11-15-1529r0 slide #96)
       1. No questions
13. **Notices**
    1. Chair: There is no liaison report from IEEE 802.19. So if anyone wishes to volunteer for this, please let me know.
    2. Chair: Regarding the earlier LoA slides, I have now corrected them within 11-15-1487r2.
14. **Working Group Motions (Old Business)** (11-15-1528r1)
    1. **Teleconferences (slide #6)**
       1. **Motion #6: Move to approve the following teleconferences**

|  |  |  |  |
| --- | --- | --- | --- |
| **Group** | **Date(s)** | **Start** | **Duration** |
| **CAC** | **Mon Feb 8, Feb 29** | **12:00 ET** | **1 hr** |
| **REG SC** | **Weekly Thurs Jan 28 to Mar 31** | **12:30 ET** | **1 hr** |
| **ARC** | **With 10 day notice** |  |  |
| **TGah** | **Weekly Tues Mar 22 to July 19** | **20:00 ET** | **2.5 hrs** |
| **TGai** | **Tues Feb 9 through May 31** | **10:00 ET** | **1.5 hr** |
| **TGak** | **Thurs Feb 1, 8, 22, 29** | **10:00 ET** | **1.5 hrs** |
| **TGmc** | **Fri Feb 5, 19** | **10:00 ET** | **2 hrs** |
| **TGaq** | **Feb 5, 12,19, 26, Mar 4** | **Noon** | **1 hr** |
| **TGax** | **Thurs Feb 4, Mar 3**  **Thurs Feb 18** | **10:00 ET**  **20:00 ET** | **2 hrs**  **2 hrs** |
| **TGay** | **Tues Feb 16** | **10:00 ET** | **1 hr** |
| **TGaz** | **Tues Feb 2** | **10:00 ET** | **1 hrs** |
| **LRLP** | **Feb 17, Feb 18** | **11:00 ET** | **1 hr** |

* + 1. Moved Rich Kennedy, 2nd Tim Godfrey
    2. No objection to approving by unanimous consent.
  1. **TGak Recirculation WG Letter Ballot (slide #7)**
     1. **Motion #7: Having approved comment resolutions for all of the comments received from LB212 on P802.11ak Draft\_D1.0 as contained in document 11-15/0556r19,**
     2. **Instruct the editor to prepare Draft D2.0 incorporating these resolutions and,**
     3. **Approve a 15 day Working Group Recirculation Ballot asking the question “Should TGak Draft\_D2.0 be forwarded to Sponsor Ballot?”**
     4. Moved by Donald Eastlake on behalf of TGak
     5. [TG vote: Moved: Michael Fischer, Seconded: Ganesh Venkatesan, Result: 4-0-0]
     6. For: 46, Against: 0, Abstain: 5 (Motion passes)
  2. **IEEE 802 liaison to ITU-R WP5D on IMT-2020 interest (slide #8)**
     1. **Motion #8: Based on interest expressed during the IEEE 802.11 WNG meeting on 19 January 2016 in the IMT-2020 activity, IEEE 802.11 WG recommends to IEEE 802 EC that a liaison be sent to ITU-R WP5D indicating that IEEE 802 is interested in participating in the IMT-2020 process.**
     2. Moved: Andrew Myles, Second: Joseph Levy
     3. C: The idea of this motion is to ensure that IEEE 802.11 has an opportunity to participate in this activity. It’s likely that IEEE-SA will be the actual delegate.
     4. C: I think that IEEE 802.11 should be representing itself and therefore the straw poll statistics should be reflected. Perhaps the motion should state IEEE 802.11, not IEEE 802. I’m also concerned about the word “interested”. That’s not what the straw polls reflected. I would prefer the word “considering”.
        1. **Motion #9: Motion to amend (with changes shown)**
        2. **Based on interest expressed during the IEEE 802.11 WNG meeting on 19 January 2016 in the IMT-2020 activity, IEEE 802.11 WG recommends to IEEE 802 EC that a liaison be sent to ITU-R WP5D indicating that IEEE 802.11 is considering ~~interested in~~ participation~~ing~~ in the IMT-2020 process.**
        3. Moved: George Calcev, Second: Majid Ghanbarinejad
        4. C: I’m frustrated at this process, as I’d prefer to discuss the main motion itself. Is there a certain deadline for this process?
        5. A: Yes, the next meeting of WP5D is in February, so a deadline will appear shortly after that meeting.
        6. C: I speak against the motion to amend, as it should be the IEEE 802 EC who provide the representation.
        7. C: I speak against the motion to amend, as I think there is strong interest in this process.
        8. C: I speak in favour of the motion amend. I don’t think IEEE 802.11 has come to closure as to what the members want to do.
        9. C: The largest category of the straw polls was actually for more information.
        10. C: The straw poll results, as in 11-15-1528r1 slide #4 were repeated verbally.
        11. For: 28, Against: 10, Abstain: 13 (Motion passes)
        12. Back to the main motion
     5. **Based on interest expressed during the IEEE 802.11 WNG meeting on 19 January 2016 in the IMT-2020 activity, IEEE 802.11 WG recommends to IEEE 802 EC that a liaison be sent to ITU-R WP5D indicating that IEEE 802.11 is considering participation in the IMT-2020 process.**
     6. C: I speak in favour of the motion
     7. C: Request to call the question
        1. No Objection to calling the question
     8. For: 34, Against: 5, Abstain: 14 (Motion passes)
     9. Chair: When I take this to the EC, they will ask me to create a liaison. Please can I ask the mover (Andrew Myles) to create a liaison?
     10. Andrew Myles: I would prefer that Joseph Levy volunteers.
     11. C: Joseph Levy volunteers.

1. **IMT 2020** (11-15-1528r2)
   1. Chair: This is a continued discussion from Wednesday about members’ interest in the IMT 2020 activity.
   2. C: I’m confused by the 5G activities for spectrum consideration. There doesn’t appear to be any IMT spectrum in the 5GHz band.
   3. A: The IMT 2020 work will recommend which additional bands will be used by the IMT 2020 technology. This may include the use of the unlicensed 5 GHz for IMT 2020 technologies.
   4. Q: So for the purposes of these polls, we should consider that 5G spectrum is 5 GHz spectrum
   5. A: I’m not sure about that.
   6. C: The term 5G is referring to “IMT 2020” and not “5GHz”
   7. C: 5725 – 5795 GHz already has a mobile allocation and is not for IMT 2020.
   8. C: I agree that the term 5G is confusing.
   9. C: Why not use the phrase “is obtaining IMT 2020 unlicensed spectrum”. I think that’s better wording.
   10. C: Please note that RLAN is different from IMT. RLAN is not an IMT technology, but IMT 2020 will consider RLAN spectrum for future technology use.
   11. Q: So, is the purpose to request some new IEEE 802.11 spectrum?
   12. A: No. However, I think IEEE 802.11 should be involved in the debate.
   13. C: Spectrum in general is important, so the answers to these straw polls are critical.
   14. **Straw Poll 1: Is obtaining access to 5G spectrum important to 802.11? (slide #11)**
       1. **1. Critically important: 26**
       2. **2. Nice to have: 2**
       3. **3. Not important: 0**
       4. **4. Abstain: 13**
   15. **Straw Poll 2: Is understanding 5G important to 802.11? (slide #9)**
       1. **1. Critically important: 26**
       2. **2. Nice to have: 2**
       3. **3. Not important: 4**
       4. **4. Abstain: 8**
   16. **Straw Poll 3: Is ensuring realistic 5G requirements important to 802.11? (slide #12)**
       1. **1. Critically important: 10**
       2. **2. Nice to have: 11**
       3. **3. Not important: 7**
       4. **4. Abstain: 10**
   17. **Straw Poll 4: Is it important to insure a fair requirements?**
   18. C: I don’t think the term “others” is very useful. For each use case the technology has suit the case and the situation. It can’t just be IEEE 802.11. In addition the word “fair” is difficult to understand.
   19. C: During the IMT 2020 process, simulations will be created for all candidate technologies. Therefore results for IEEE 802.11 should also be considered. Otherwise, the simulation models will not include IEEE 802.11. I’m not trying to put “other” technologies down, but the analysis should be fair.
   20. C: Can we change the wording of the straw poll.
   21. A: Yes, please change to *“***Is it important to ensure a fair set of requirements?***”*
       1. **1. Critically important: 15**
       2. **2. Nice to have: 1**
       3. **3. Not important: 7**
       4. **4. Abstain:16**
   22. **Straw Poll 5: Is 802.11 just being a 5G Technology is important? (slide #13)**
   23. C: I would like to recall that WEP was a PR disaster for IEEE 802.11. Additionally Wi-Fi is a strong brand, whereas 3G/4G are known as cellular technologies. Therefore I’m not so sure about this.
       1. **1. Critically important: 7**
       2. **2. Nice to have: 5**
       3. **3. Not important: 9**
       4. **4. Abstain: 13**
   24. **Straw Poll 6: Is ensuring 802.11 is an IMT-2020 technology that can be fairly compared with other IMT-2020 technologies important? (slide #11)**
   25. C: You could improve this straw poll by changing the term to “IEEE 802.11xx”, as it needs to refer to the newer parts of IEEE 802.11.
   26. A: Yes. The amended straw poll is **“Is ensuring an 802.11 amendment is an IMT-2020 technology that can be fairly compared with other IMT-2020 technologies important?”**
       1. **1. Critically important: 4**
       2. **2. Nice to have: 9**
       3. **3. Not important: 4**
       4. **4. Abstain:17**
2. **Leadership Summit** (11-15-1487r2 slide #34)
   1. This slide describes the IEEE 802.11 / Wi-Fi Alliance (WFA) leadership summit.
   2. **Straw poll 1: Do you approve of the leadership summit?**
   3. Y: 32, N: 0, A: 2
   4. **Straw poll 2: Is advance working group review of the tentative agenda for the leadership summit needed?**
   5. C: I would agree that I think this useful. I would prefer not to jump the gun on certain topics. Just a single slide in the mid-week plenary would be enough.
   6. C: Remember that the WFA also choose some of the agenda topics.
   7. C: I think this whole exercise is very important. I wouldn’t want this review to slow down the progress of these meetings.
   8. C: That was not the purpose of the earlier comment about having a review.
   9. Y: 27, N: 4, A: 8
   10. Chair: Ok, so going forward we will review any future agendas for this meeting at the IEEE 802.11 mid-week plenary. I think the next time this will occur will be in October 2016.
3. **Future of IEEE 802.18** (11-16-0196r0)
   1. Chair of this week’s EC ad-hoc: There will be an EC eBallot on the mission statement. The plan will be presented at this afternoon’s workshop, where items could be updated. Mike Lynch has agreed to operate this week during the March 2016 plenary.
   2. Chair: I understand that the Tuesday morning meeting will establish the agenda for the rest of the week and therefore organize the ad-hocs. Documents coming out of IEEE 802.18 will be IEEE 802 positions, not IEEE 802.11 positions.
   3. Chair: In addition, we’re not sure if the IEEE 802.11/15 regulatory committee will be required to continue after this. We’ll have to make that decision at some time after the March 2016 meeting.
   4. Q: RR TAG refers to IEEE 802.18?
   5. A: This just an abbreviation for Radio Regulatory TAG, which is the current name of IEEE 802.18.
4. **AoB**
   1. C: I would like to consider an information item added to the agenda.
   2. Chair: Is there any objection to discuss an extra information item?
   3. None seen
   4. C: So, I would like to know what happened to the attendance report topic?
   5. Chair: The report was in response to the motion from the November 2015 meeting. That report was produced and so the item was closed.
   6. C: Ok, so I’ll send an email to bring this issue back at a future meeting.
   7. Chair: In addition I would like to consider the abstain rules on ballots, as members are still doing this the wrong way and potentially losing their voting rights.
5. **Next Meeting** (11-15-1487r1)
   1. There will be an IEEE 802 Wireless Chairs meeting as shown in Slide #16 at the March 2016 meeting. This is an open meeting and everyone is welcome.
   2. Chair: I would like to invite the IEEE 802.11/15 Regulatory chair pro-tem to this wireless chairs meeting.
   3. Please note the announcement of the next meeting in Macau March 2016.
6. **Adjournment**
   1. Chair: Having completed the agenda, the chair announced that the meeting was adjourned at 10:53 EST.

**Annex A: Attendance & Affiliation**

|  | | |
| --- | --- | --- |
| **Name** | **Affiliation** | **Attended >= 75%?** |
| Abdallah, Ramy | Sony Corporation | Yes |
| Aboulmagd, Osama | Huawei Technologies Co. Ltd | Yes |
| Adachi, Tomoko | TOSHIBA Corporation | Yes |
| Agardh, Kare | Sony Mobile Communications | Yes |
| Ahn, Jinsoo | Yonsei University | No |
| Ahn, Woojin | Yonsei University | No |
| Akhmetov, Dmitry | Intel Corporation | Yes |
| Aldana, Carlos | Qualcomm Incorporated | Yes |
| Alpert, Yaron | Intel Corporation | Yes |
| Armstrong, Lee | US Department of Transportation | Yes |
| Asterjadhi, Alfred | Qualcomm Incorporated | Yes |
| Au, Kwok Shum | Huawei Technologies Co. Ltd | Yes |
| Auluck, Vijay | Intel Corporation | Yes |
| Azizi, Shahrnaz | Intel Corporation | Yes |
| Bagby, David | Calypso Ventures, Inc. | Yes |
| Baik, Eugene | Qualcomm Incorporated | No |
| bang, saehee | LG ELECTRONICS | Yes |
| baron, stephane | Canon Research Centre France | Yes |
| Barr, David | Intel Corporation | Yes |
| Barriac, gwendolyn | Qualcomm Incorporated | Yes |
| Bei, Jianwei | Marvell Semiconductor, Inc. | Yes |
| Berger, Christian | Marvell Semiconductor, Inc. | Yes |
| Bhandaru, Nehru | Broadcom Corporation | Yes |
| Bharadwaj, Arjun | Qualcomm Incorporated | Yes |
| Bims, Harry | Bims Laboratories, Inc. | No |
| Brandt, David | Rockwell Automation | Yes |
| Bynam, Kiran | SAMSUNG | No |
| Calcev, George | Huawei R&D USA | Yes |
| Calvert, Chris | Landis Gyr Group Worldwide | Yes |
| Camillo, Gentile | National Institute of Standards and Technology (NIST) | No |
| Cao, Rui | Marvell Semiconductor, Inc. | Yes |
| Cariou, Laurent | Intel Corporation | No |
| Carney, William | Sony Corporation | Yes |
| Chang, Kim | Huawei Technologies Co. Ltd | Yes |
| CHANG, SANGHYUN | SAMSUNG ELECTRONICS | Yes |
| Chang, Soo-Young | California State University, Sacramento (CSUS) | Yes |
| Chaplin, Clint | Imagicon | No |
| Chen, Xiaogang | Intel Corporation | Yes |
| Cheong, Minho | Newracom Inc. | Yes |
| CHERIAN, GEORGE | Qualcomm Incorporated | Yes |
| Cherniavsky, Dmitry | SiBEAM, Inc. | Yes |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. | Yes |
| Cho, Hangyu | lg electronics | Yes |
| Choi, Jaehyuk | Gachon University | No |
| Choi, Jinsoo | LG ELECTRONICS | Yes |
| Choi, Jinyong | LG ELECTRONICS | No |
| Choudhury, Sayantan | Nokia | Yes |
| Chu, Liwen | Marvell Semiconductor, Inc. | Yes |
| Ciochina, Dana | Sony Corporation | Yes |
| Coffey, John | Realtek Semiconductor Corp. | Yes |
| Cordeiro, Carlos | Intel Corporation | Yes |
| de Vegt, Rolf | Qualcomm Incorporated | Yes |
| Debergh, Pierre | Orange | Yes |
| Eastlake 3rd, Donald | Huawei Technologies Co. Ltd | Yes |
| Ecclesine, Peter | Cisco Systems, Inc. | Yes |
| Edgar, Richard | Imagination Technologies Ltd. | Yes |
| Eitan, Alecsander | Qualcomm Incorporated | Yes |
| Ellis, Simon | Intel Corporation | No |
| Emmelmann, Marc | Self Employed | Yes |
| Erceg, Vinko | Broadcom Corporation | Yes |
| Fang, Yonggang | ZTE Corporation | Yes |
| Feng, Wei | Tsinghua University; Huawei Technology Corporation | No |
| Finn, Norman | Cisco Systems, Inc. | No |
| Fischer, Matthew | Broadcom Corporation | Yes |
| Fischer, Michael | NXP Semiconductors | Yes |
| Fricke, Alexander | TU Braunschweig | No |
| Fuller, Richard | OmniTrail Technologies | Yes |
| Furuichi, Sho | Sony Corporation | Yes |
| Ghanbarinejad, Majid | Huawei R&D USA | Yes |
| Ghosh, Chittabrata | Intel Corporation | Yes |
| Gilb, James | Tensorcom, Inc. | No |
| Godfrey, Tim | Electric Power Research Institute, Inc. (EPRI) | Yes |
| Golmie, Nada | National Institute of Standards and Technology (NIST) | No |
| Grandhe, Niranjan | Marvell Semiconductor, Inc. | Yes |
| Hall, Robert | Johnson Controls Inc | Yes |
| Halls, David | Toshiba of Europe Ltd. | Yes |
| Handte, Thomas | Sony Corporation | Yes |
| Hansen, Christopher | Covariant Corporation | Yes |
| Harkins, Daniel | Aruba Networks, Inc. | Yes |
| Hart, Brian | Cisco Systems, Inc. | Yes |
| Hartman, Chris | Apple, Inc. | Yes |
| He, Linhai | Qualcomm Incorporated | Yes |
| Hedayat, Ahmadreza | Newracom Inc. | Yes |
| Henry, Jerome | Cisco Systems, Inc. | Yes |
| Hiertz, Guido | Ericsson AB | Yes |
| Ho, Duncan | Qualcomm Incorporated | Yes |
| Horisaki, Koji | TOSHIBA Corporation | Yes |
| Hou, Victor | Broadcom Corporation | No |
| Hua, Rui | ZTE Corporation | Yes |
| Huang, Lei | Panasonic Asia Pacific Pte Ltd. | Yes |
| Huang, Po-Kai | Intel Corporation | Yes |
| Huang, Rongsheng | MediaTek Inc. | Yes |
| Huang, Zhiyong | LitePoint Corporation/Teradyne | Yes |
| Hunter, David | WireFi Networks Inc. | Yes |
| Hurtarte, Jeorge | Teradyne, Inc. | No |
| Ibrahim, Brima | Broadcom Corporation | Yes |
| Inoue, Yasuhiko | Nippon Telegraph and Telephone Corporation (NTT) | Yes |
| Ishizu, Kentaro | National Institute of Information and Communications Technology (NICT) | Yes |
| Iwatani, Junichi | Nippon Telegraph and Telephone Corporation (NTT) | Yes |
| Jeffries, Timothy | Huawei R&D USA | No |
| Ji, Mingyue | Broadcom Corporation | Yes |
| Jiang, Jinjing | Marvell Semiconductor, Inc. | Yes |
| Jin, Liang | Spirent Communications | Yes |
| Jo, Kyungtae | LG ELECTRONICS | Yes |
| Johnsson, Kerstin | Intel Corporation | Yes |
| Jones, Vincent Knowles IV | Qualcomm Incorporated | Yes |
| Josiam, Kaushik | SAMSUNG | Yes |
| Kain, Carl | US Department of Transportation | No |
| Kakani, Naveen | Qualcomm Incorporated | Yes |
| Karnam, Mohan | Imagination Technologies Ltd. | Yes |
| Kasher, Assaf | Intel Corporation | Yes |
| Kennedy, Richard | Unlicensed Spectrum Advocates, LLC | No |
| Kerry, Stuart | OK-Brit | Yes |
| Khorov, EVGENY | IITP RAS | Yes |
| Khoury, Peter | Ruckus Wireless | Yes |
| KIM, Jay | LG ELECTRONICS | No |
| Kim, Jeongki | LG ELECTRONICS | Yes |
| Kim, Jin Min | LG ELECTRONICS | Yes |
| Kim, Joonsuk | Apple, Inc. | Yes |
| Kim, Sang Gook | LG ELECTRONICS | Yes |
| Kim, Suhwook | LG ELECTRONICS | Yes |
| Kim, Yongho | Korea National University of Transportation | No |
| Kim, Youn-Kwan | The Catholic University of Korea | Yes |
| Kirimis, Dimitri | Newracom Inc. | Yes |
| Kiryanov, Anton | IITP RAS | Yes |
| Kitazawa, Shoichi | ATR Wave Engineering Laboratories | Yes |
| Kloper, David | Cisco Systems, Inc. | Yes |
| KNECKT, JARKKO | Apple, Inc. | No |
| Ko, Geonjung | WILUS Institute | Yes |
| Kolze, Tom | Broadcom Corporation | No |
| Kotzer, Igal | General Motors Company | Yes |
| Kountz, Dennis | Chemours | No |
| Kumar, Rajesh | Qualcomm Incorporated | Yes |
| Kwon, Young Hoon | Newracom Inc. | Yes |
| Lalam, Massinissa | SAGEMCOM SAS | Yes |
| Lan, Zhou | National Institute of Information and Communications Technology (NICT) | Yes |
| Lansford, James | Qualcomm Incorporated | Yes |
| Lee, Daewon | Newracom Inc. | Yes |
| Lee, Hyeong Ho | Electronics and Telecommunications Research Institute (ETRI) | No |
| Lee, Jae Seung | ETRI | No |
| Leicht, Suzanne | National Security Agency | Yes |
| Lepp, James | BlackBerry | Yes |
| Levy, Joseph | InterDigital, Inc. | Yes |
| Li, Guoqing | Apple, Inc. | No |
| Li, Qinghua | Intel Corporation | Yes |
| Li, Yanchun | Huawei Technologies Co. Ltd | Yes |
| Li, Yizhou | Huawei Technologies Co. Ltd | No |
| Li, Yunbo | Huawei Technologies Co. Ltd | Yes |
| Lim, Dong Guk | LG ELECTRONICS | Yes |
| Lin, Meilu | HUAWEI | Yes |
| Lin, Yingpei | Huawei Technologies Co. Ltd | Yes |
| Liu, Fulei | ZTE Corporation | Yes |
| Liu, Jianhan | MediaTek Inc. | Yes |
| Liu, Le | Huawei Technologies Co. Ltd | Yes |
| Liu, Yun | Huawei Technologies Co., Ltd | Yes |
| Loc, Peter | Huawei Technologies Co. Ltd | Yes |
| Lomayev, Artyom | Intel Corporation | No |
| Lou, Hui-Ling | Marvell Semiconductor, Inc. | Yes |
| Luo, Jun | Huawei Technologies Co. Ltd | Yes |
| Luo, Yi | Huawei Technologies Co. Ltd | No |
| Lv, Kaiying | ZTE Corporation | Yes |
| Lynch, Michael | MJ Lynch & Associates, LLC. | No |
| Ma, Jing | National Institute of Information and Communications Technology (NICT) | No |
| Maamari, Diana | Huawei R&D USA | Yes |
| MADHAVAN, NARENDAR | TOSHIBA Corporation | Yes |
| Maeda, Shigeru | TOSHIBA Corporation | Yes |
| Malik, Rahul | Qualcomm Incorporated | Yes |
| Malinen, Jouni | Qualcomm Incorporated | Yes |
| Maltsev, Alexander | Intel Corporation | No |
| Mangold, Stefan | Itron Inc. | Yes |
| Mano, Hiroshi | Koden Techno Info K.K. | Yes |
| Marks, Roger | EthAirNet Associates | No |
| Mccann, Stephen | BlackBerry | Yes |
| Merlin, Simone | Qualcomm Incorporated | Yes |
| Mestanov, Filip | Ericsson AB | Yes |
| Monajemi, Pooya | Cisco Systems, Inc. | Yes |
| Montemurro, Michael | Research In Motion Limited | Yes |
| Montreuil, Leo | Broadcom Corporation | Yes |
| Mori, Kenichi | Space-Time Engineering | No |
| Mori, Masahito | Sony Corporation | Yes |
| Morioka, Hitoshi | SRC Software | Yes |
| Morioka, Yuichi | Sony Corporation | Yes |
| Moskowitz, Robert | HTT Consulting | No |
| Mourad, Alaa | BMW Group | No |
| Murakami, Yutaka | Panasonic Corporation | Yes |
| Myles, Andrew | Cisco Systems, Inc. | Yes |
| Nabetani, Toshihisa | TOSHIBA Corporation | Yes |
| Nagai, Yukimasa | Mitsubishi Electric Corporation | Yes |
| Nakano, Hiroki | CAHI Corporation | Yes |
| Nandagopalan, SAI SHANKAR | Ubilite Inc | Yes |
| Nejatian, Alireza | Ericsson AB | No |
| Noh, Yujin | Newracom Inc. | Yes |
| Notor, John | Notor Research; ARM, Inc. | Yes |
| Odman, Knut | Broadcom Corporation | Yes |
| Oh, Minseok | Kyonggi University | Yes |
| OH, MIN-SEOK | LG Electronics | No |
| Oltman, Randy | Octoscope | No |
| Oteri, Oghenekome | InterDigital, Inc. | Yes |
| Oyama, Satoshi | Association of Radio Industries and Businesses (ARIB) | Yes |
| Palm, Stephen | Broadcom Corporation | Yes |
| Pandey, Santosh Ghanshyam | Cisco Systems, Inc. | Yes |
| Pang, Jiyong | Huawei Technologies Co. Ltd | Yes |
| Park, Eunsung | LG Electronics | Yes |
| Park, Hyunhee | LG ELECTRONICS | Yes |
| Park, Jeonghwan | Newracom Inc. | Yes |
| Park, Minyoung | Intel Corporation | Yes |
| Park, Sung-jin | LG ELECTRONICS | Yes |
| Parsons, Glenn | Ericsson AB | No |
| Patil, Abhishek | Qualcomm Incorporated | Yes |
| Perez, Javier | Intel Corporation | No |
| Perkins, Charles | Futurewei Technologies | No |
| Persson, Hakan | Ericsson AB | Yes |
| Petranovich, James | ViaSat, Inc. | Yes |
| petrick, Albert | Jones-Petrick and Associates, LLC. | Yes |
| Pienciak, Walter | IEEE | No |
| porat, ron | Broadcom Corporation | Yes |
| Qi, Emily | Intel Corporation | Yes |
| Qiao, Dengyu | Huawei Technologies Co. Ltd | Yes |
| Qu, Shouxing | BlackBerry | Yes |
| Rabarijaona, Verotiana | National Institute of Information and Communications Technology (NICT) | Yes |
| Rakanovic, Demir | u-blox | Yes |
| Rayment, Stephen | Ericsson AB | Yes |
| Riegel, Maximilian | Nokia | Yes |
| Rong, Zhigang | Huawei Technologies Co. Ltd | Yes |
| Rosdahl, Jon | Qualcomm Technologies Inc. | Yes |
| Roy, Arnab | InterDigital, Inc. | Yes |
| Ruan, Wei | HUAWEI | No |
| Ryu, Kiseon | LG ELECTRONICS | Yes |
| Sakamoto, Takenori | Panasonic Corporation | Yes |
| Sakoda, Kazuyuki | Sony Corporation | Yes |
| Salazar Cardozo, Ruben | Landis Gyr Group Worldwide | No |
| Sambasivan, Sam | AT&T | Yes |
| Sampath, Hemanth | Qualcomm Incorporated | Yes |
| Sato, Naotaka | Sony Corporation | Yes |
| Schelstraete, Sigurd | Quantenna Communications, Inc. | Yes |
| Scott, Andy | NCTA | Yes |
| Segev, Jonathan | Intel Corporation | Yes |
| Seok, Yongho | Newracom Inc. | No |
| SHAO, PENG | NEC Communication Systems, Ltd. | Yes |
| Shellhammer, Stephen | Qualcomm Incorporated | No |
| Shen, Bazhong | Broadcom Corporation | Yes |
| Shen, Cong | University of Science and Technology of China (USTC) | No |
| Sherlock, Ian | Texas Instruments Incorporated | Yes |
| Shimada, Shusaku | Schubiquist Technologies | No |
| Slaats, Patrick | IEEE-SA | No |
| Smith, Graham | SR Technologies | Yes |
| Son, Ju-Hyung | WILUS Institute | Yes |
| Stacey, Robert | Intel Corporation | Yes |
| Stanley, Dorothy | Hewlett Packard Enterprise | Yes |
| Stephens, Adrian | Intel Corporation | Yes |
| Stott, Noel | Ixia | Yes |
| Strickland, Stuart | Hewlett Packard Enterprise | No |
| SU, HONGJIA | Huawei Technologies Co. Ltd | Yes |
| Suh, JUNG HOON | Huawei Technologies Co. Ltd | Yes |
| Sun, Bo | ZTE Corporation | Yes |
| Sun, Chen | Sony Corporation | No |
| Sun, Li-Hsiang | InterDigital, Inc. | Yes |
| sun, sheng | Huawei Technologies Co. Ltd | Yes |
| Sun, Yakun | Marvell Semiconductor, Inc. | Yes |
| Sun, Yanjun | Qualcomm Incorporated | Yes |
| Takahashi, Kazuaki | Panasonic Corporation | Yes |
| Takai, Mineo | Space-Time Engineering | Yes |
| Takatori, Yasushi | Nippon Telegraph and Telephone Corporation (NTT) | No |
| Tamhane, Sagar | Marvell Semiconductor, Inc. | Yes |
| Tanaka, Yusuke | Sony Corporation | Yes |
| Taniguchi, Kentaro | TOSHIBA Corporation | Yes |
| Taori, Rakesh | SAMSUNG | Yes |
| Tayamon, Soma | Ericsson AB | Yes |
| Tian, Bin | Qualcomm Incorporated | Yes |
| Tian, Tao | Qualcomm Incorporated | Yes |
| Tinnakornsrisuphap, Peerapol | Qualcomm Incorporated | Yes |
| TorabJahromi, Payam | Broadcom Corporation | Yes |
| TOSHINAGA, Hideki | NTT | No |
| Tsai, Chia-Hung | MediaTek Inc. | Yes |
| Tuomaala, Esa | Nokia | Yes |
| Urabe, Yoshio | Panasonic Corporation | Yes |
| Van Nee, Richard | Qualcomm Incorporated | Yes |
| Varshney, Prabodh | Nokia | Yes |
| Venkatesan, Ganesh | Intel Corporation | Yes |
| Venkateswaran, Sriram | Broadcom Corporation | Yes |
| VIGER, Pascal | Canon Research Centre France | Yes |
| Vlantis, George | STMicroelectronics | Yes |
| Wang, Chao Chun | MediaTek Inc. | Yes |
| Wang, Hao | Fujitsu Research & Development Center | No |
| Wang, Huizhao | Quantenna Communications, Inc. | Yes |
| Wang, James June | MediaTek Inc. | Yes |
| Wang, Lei | Marvell Semiconductor, Inc. | Yes |
| Wang, Qi | Broadcom Corporation | Yes |
| Wang, Xiaofei | InterDigital, Inc. | Yes |
| Wang, Xuehuan | Huawei Technologies Co. Ltd | Yes |
| Ward, Lisa | Rohde & Schwarz | No |
| Watanabe, Fujio | NTT DoCoMo, Inc. | Yes |
| Wentink, Menzo | Qualcomm Incorporated | Yes |
| Wilhelmsson, Leif | Ericsson AB | Yes |
| Wong, Eric | Apple, Inc. | No |
| Wu, Tianyu | MediaTek Inc. | No |
| Xin, Yan | Huawei Technologies Co. Ltd | Yes |
| Xing, Weimin | ZTE Corporation | Yes |
| Xue, Qi | Qualcomm Incorporated | Yes |
| Yang, Ou | Intel Corporation | Yes |
| YANG, RUI | InterDigital, Inc. | Yes |
| Yang, Xun | Huawei Technologies Co. Ltd | Yes |
| Yang, Yunsong | Huawei Technologies Co. Ltd | Yes |
| YAO, KE | ZTE Corporation | Yes |
| Yee, James | MediaTek Inc. | Yes |
| Yee, Peter | NSA/IAD | Yes |
| Yokota, Hidetoshi | Landis Gyr Group Worldwide | No |
| Yong, Su Khiong | Apple, Inc. | Yes |
| Young, Christopher | Broadcom Corporation | Yes |
| Yu, Bo | Marvell Semiconductor, Inc. | Yes |
| Yu, Heejung | Yeungnam University | Yes |
| Yu, Jian | Huawei Technologies Co. Ltd | Yes |
| Yunoki, Katsuo | KDDI R&D Laboratories | Yes |
| Zeleznikar, Alan | ARRIS Group | Yes |
| Zhang, Hongyuan | Marvell Semiconductor, Inc. | Yes |
| ZHANG, JIAYIN | Huawei Technologies Co. Ltd | Yes |
| Zhang, Xingxin | Huawei Technologies Co. Ltd | Yes |
| Zheng, Xiayu | Marvell Semiconductor, Inc. | Yes |
| Zhu, Jun | Huawei Technologies Co. Ltd | Yes |
| Zuniga, Juan | InterDigital, Inc. | Yes |

**Annex B : Working Group Officers**

Working group

|  |  |  |
| --- | --- | --- |
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Study Groups

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| --- | --- | --- |
| **Name (Affiliation)** | **Position** | **Contact Details** |

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Liaison Officials to IEEE 802 organizations

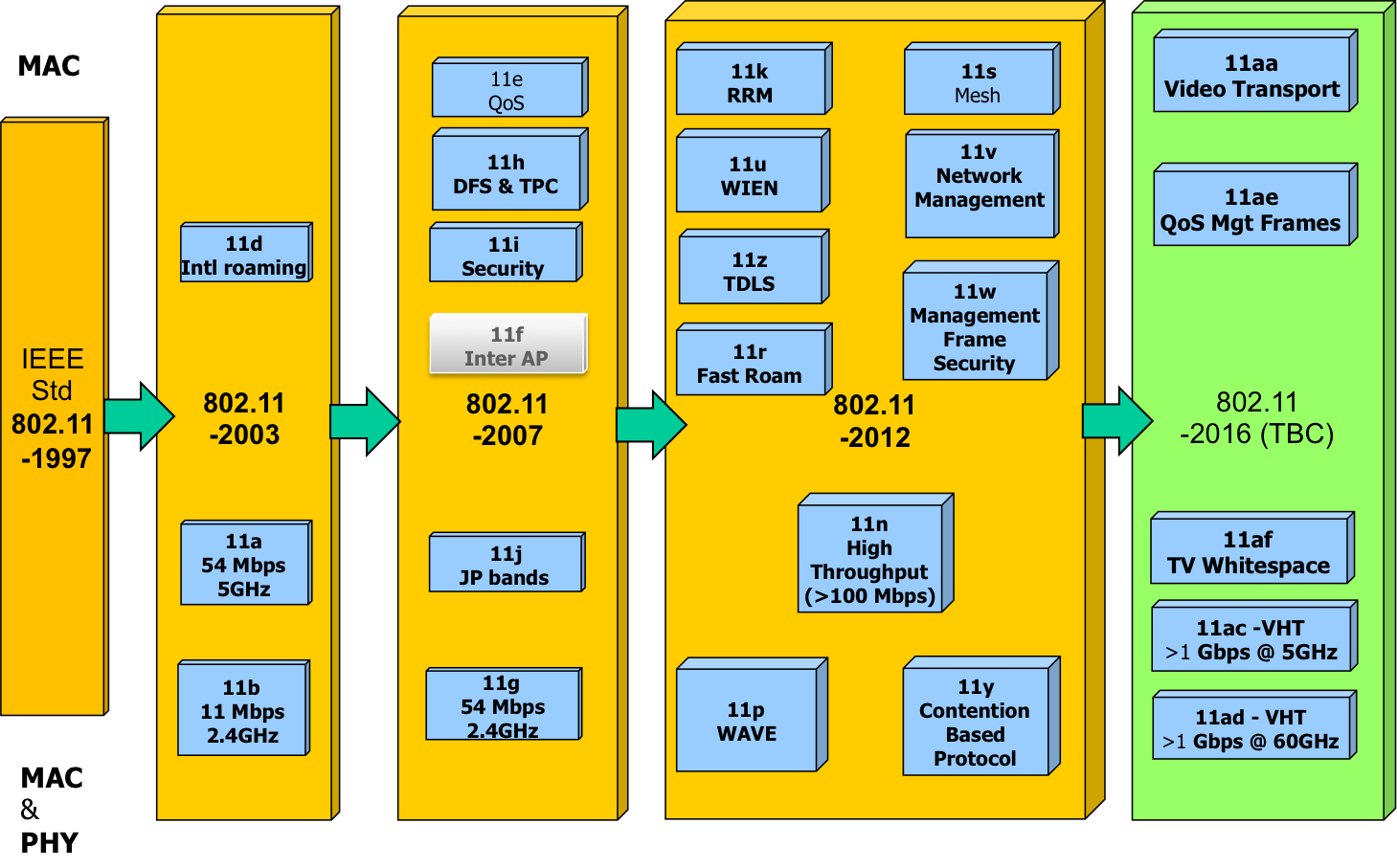
|  |  |  |
| --- | --- | --- |
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| Rich Kennedy  (Unlicensed Spectrum Advocates) | Liaison to IEEE 802.18 | +1 (832) 298-1114  [rkennedy1000@gmail.com](mailto:rkennedy1000@gmail.com) |
| Tim Godfrey (Electric Power Research Institute) | Liaison to IEEE 802.24 | +1 (650) 855-8584 (office) [tim.godfrey@ieee.org](mailto:tim.godfrey@ieee.org) |

**Annex C : Minutes**

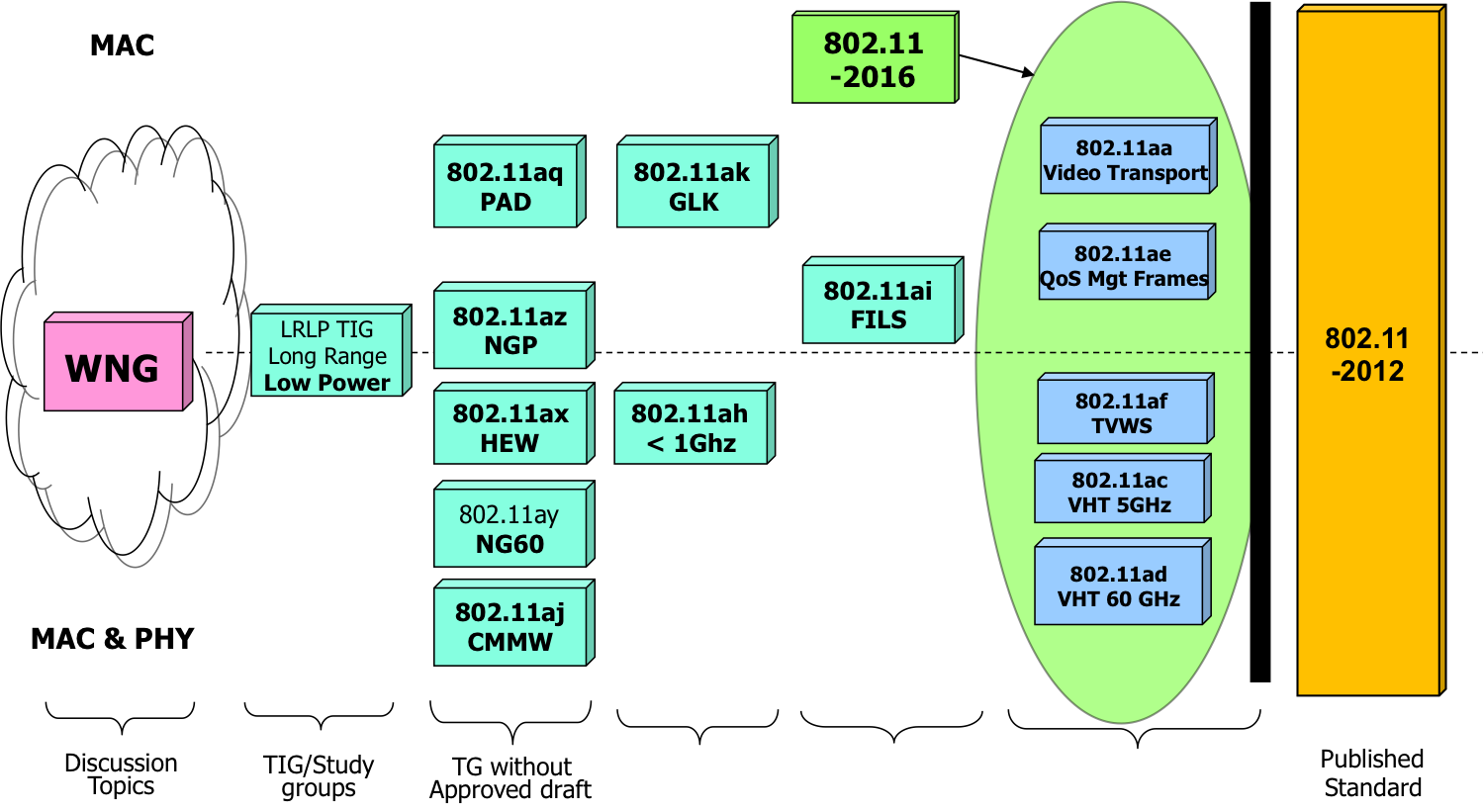
This Annex contains references to all IEEE 802.11 SC/TG/SG & Ad Hoc Committee (AHC) minutes from this meeting. Please note that they are NOT subject to the approval of these minutes, but are confirmed and approved by their individual group in the opening meeting at their next session.

|  |  |  |
| --- | --- | --- |
| WG | TE | 16-0064r1 |
| TGmc | TG | 16-0123r0 |
| TGah | TG | 16-0175r0 |
| TGai | TG | 16-0186r0 |
| TGaj | TG | Did not meet |
| TGak | TG | 16-0189r0 |
| TGaq | TG | 16-0195r0 |
| TGax | TG | 16-0096r0 |
| TGay | TG | 16-0xxxr0 |
| TGaz | TG | 16-0213r0 |
| LRLP | TIG | 16-0199r0 |
| WNG | SC | 16-0162r0 |
| ARC | SC | 16-0xxxr0 |
| JTC1 | SC | 16-0xxxr0 |
| REG | SC | 16-0144r0 |

**Annex D : Revisions and Standards Pipeline**



**IEEE 802.11 Revisions**



**IEEE 802.11 Standards Pipeline**

End.