IEEE 802.18

Radio Regulatory-TAG

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| Radio Regulatory Technical Advisory Group Minutes | | | | |
| Date: 14-16 Jan 20 | | | | |
| Name | Affiliation | Address | Phone | Email |
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|  | | | | |
| Author and Officer presiding: | | | | |
| Jay Holcomb,  Chair, RR-TAG | Itron | Liberty Lake, (Spokane) WA | +1(509) 891-3281 | jholcomb@ieee.org |

Abstract

Minutes of the IEEE 802 RR-TAG Wireless Interim in Irvine, CA, USA.

These are the Minutes of the IEEE 802 RR-TAG Wireless Interim, Thursday, 14-16 Jan 20

Chair calls the meeting to order at 10:33 local.

1. Chair presents slides 2 – 6 of 802.18-20/0003r01, the call to order and administrative items
   1. Includes IEEE 802 meeting and participant’s guidelines and requirements.
   2. Note, 802.15 started a new task group this week and new members of IEEE 802 are in attendance.
2. Chair presents slides 7, of 802.18-20/0003r01, the agenda:
   1. Call to Order
      1. Attendance server is open
   2. Administrative items
      1. Someone to take some notes: Peter Ecclesine (Cisco)
   3. Approve agenda & last minutes
      1. looking for an 802.18 Vice-Chair & Sec.
      2. Elections in March
   4. Discussion items
      1. EU Items
      2. ITU-R Items
      3. FCC 5.9 GHz NPRM
      4. General Discussion Items
   5. Agenda for Thursday
      1. ITU-R M.1450 Ad Hoc status
      2. FCC 5.9 GHz FCC’s NPRM
   6. Actions required
      1. FCC 5.9 GHz NPRM contributions
      2. Anything new today
      3. Later: WRC-xx Agenda Items, interest to IEEE 802
   7. AOB and Adjourn
3. Chair presents slide 8-9, Administrative – Motions and more
   1. Motion: To approve the agenda as presented on previous slide

Moved by: Stuart Kerry (Ruckus)

Seconded by: Mike Lynch (MJLync Assoc.)

Discussion? None

Vote: Approved by unanimous consent

* 1. Motion: To approve the minutes from the IEEE 802.18 Plenary 12-14 Nov 2019 in document: <https://mentor.ieee.org/802.18/dcn/19/18-19-0143-00-0000-minutes-koa-plenary-10-15nov2019-rr-tag.docx> Posted: 16-Nov-2019 09:07:07 ET

Moved by: Stuart Kerry (Ruckus)

Seconded by: Steve Palm (Broadcom)

Discussion? None

Vote: Approved Unanimous consent

* 1. Motion: To approve the minutes from the IEEE 802.18 Teleconference 02 Jan 2020 in document [https://mentor.ieee.org/802.18/dcn/19/18-19-0167-00-0000-minutes-02jan20-rrtag-teleconference.docx](https://mentor.ieee.org/802.18/dcn/19/18-19-0165-00-0000-minutes-26dec19-rrtag-teleconference.docx) 03-Jan-2020 15:17:33 ET

Moved by: Peter Ecclesine (Cisco)

Seconded by: Mike Lynch (MJLynch Assoc.)

Discussion? None

Vote: Approved by unanimous consent

* 1. Is anyone able to help as the 802.18 Vice-Chair? No one spoke up.
     1. Needs to be a member of the IEEE and also the SA, needs a declaration of term commitment and affiliation letters to the EC. O
  2. Is anyone able to help as the 802.18 Secretary? No one spoke up.
     1. Secretary must be IEEE SA member, though letters are not needed.
  3. **LMSC P&P sections 3.1 and 4.0: 802 EC election/appointments**
     1. all 802 executive committee members are elected or appointed and confirmed at the first Plenary session of each even numbered year.
     2. ***Election/appointments shall occur at the March 2020 Plenary session in ATL.***
  4. **If anyone wishes to be considered for the 802.18 Chair, Vice Chair or the appointed positions**
     1. Please send nominations to the Chair before Friday 13 March end of day ET.
     2. 802.18 elections will be at the Tuesday meeting.
  5. **All potential EC members, Chair and Vice Chairs**
     1. Please remember to submit your letter of endorsement and disclosure of affiliation to the IEEE 802 Recording Secretary, John D’Ambrosia, as soon as possible, but no later than the call to order of the March 2020 opening EC meeting.
  6. **For Chair, Vice Chair and Secretary, you need to be a member of the IEEE SA**

1. Chair presents slides 10-12, EU items to share
   1. Remember for the 802.11 members in the .11 document private area many of the working EU org documents are available and updated often.
   2. **ETSI –** [**<BRAN>**](https://portal.etsi.org/tb.aspx?tbid=287&SubTB=287) **next meetings #105, 23–27Mar20, Sophia-Antipolis** 
      1. New Chairman (Ericsson) proposed some procedural changes and also appointed 2 Vice Chairmen, from BCOM and Huawei.
      2. EN 301 893 5 GHz Standard: Spectrum mask, 5.8 GHz and Test Signal for Preamble Detect test were discussed. Some agreements but in general all topics will be further discussed in G2M prior to next Face to Face meeting. Aim to finish this version of the standard at BRAN#105, Mar 23-27.
      3. 6 GHz Standard work (draft EN 303 687 v0.0.1) discussions related to channel access mechanism. Further discussions at future GoToMeeting. Draft will be updated to v0.0.2 after the GoToMeeting with outcome of discussions to date and January 22-24 FM57 meeting.
      4. EN 302 567 LS sent to HAS Consultant to advise of documents submitted for 2nd review.
      5. EN 303 722 Harmonized Standard increasing 60 GHz band up to 71 GHz. Rapporteur asked for contributions
      6. TR 103 721 WAS/RLAN Mitigation techniques in the 5725 - 5850 MHz: Some concerns related to interference as products are allowed in the 5.8GHz band in UK (but could be commercialized in other member states) were highlighted at WGFM#57 and a new work item FM57\_W103 was created.TC BRAN created a similar Work Item ( TC BRAN (DTR/BRAN-230023 (TR 103 721) to create this new technical report. The aim is to include mitigations techniques that will allow sharing with radars (including Fast Frequency Hopping radars), Road Tolling and smart tachograph. GoToMeeting scheduled as below to discuss further.

* 1. **ETSI - ERM -** [<TG-11>](https://portal.etsi.org/tb.aspx?tbid=442&SubTB=442) **meeting # \_\_\_\_**
     1. 19th Dec call discussed 2.4 GHz SRDoc TR 103 665.
     2. Two further meetings scheduled on this SRDoc on 27Jan and 27Feb
  2. **ETSI** [<ERM>](https://portal.etsi.org/tb.aspx?tbid=286&SubTB=286) **next meeting #70, 17-20Mar20, Sophia Antipolis**
     1. - 25/26Nov ERM-EG 203 336 (Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU ) comments resolution meeting to address further comments from Final draft Rejected at ERM#69 in October.
     2. 13Dec there was a 2nd resolution meeting.
     3. Plan is to vote for approval of EG 203 336 in the March meeting.
  3. **CEPT – ECC** [<SE45>](https://cept.org/ecc/groups/ecc/wg-se/se-45/client/introduction/) **next meeting #10, 20-22Jan20, Prague, Czech Republic**
     1. In 09-11Dec meeting: Report drafted dealing with the short-term protection of fixed service point-to-point applications from WAS/RLAN indoor-only deployments as well as potential WAS/RLAN portable outdoor devices with lower power levels. (contentious)
     2. This is intended to complement the previous ECC report 302 output of the group in anticipation that WGSE decide that this is an appropriate deliverable.
     3. Further work on interference of VLP Indoor devices and site-specific studies for UK and France still to finalize in the meeting next week.
     4. This will be the last meeting of SE45 unless it is re-chartered.
     5. Many contributions are in for next week, but not from France and UK yet.
  4. **CEPT – ECC** [<FM57>](https://cept.org/ecc/groups/ecc/wg-fm/fm-57/client/introduction/) **next meeting #9, 22-24Jan20, Prague, Czech Republic**
     1. Minutes from last meeting are now posted and everything is there.
     2. The contentious discussions from the last meeting are likely to continue in the January meeting.
     3. RLAN does have their contributions in already.
     4. Four main efforts now:
        1. 2nd report, report B, and EC decision to open 6 GHz
        2. 5.8 GHz
        3. Urban Rail, country by country
        4. Sharing in all of 5 GHz.

1. (SE45-specs; FM57-policies and EC decisions; have different regulators between them)
2. **Chair presents slide 13, ITU-R items to share**
   1. Nothing new shared.
   2. Note: will cover M.1450/M.1801 ad hoc status thursday.
   3. If time permits on Thursday, 802.18 will review WRC-23 agenda items
   4. Slide 13 provides links with updates and final acts from WRC-19
3. **Chair presents slide 14-22, FCC’s 5.9 GHz NPRM**
   1. **The NPRM: <<= new OOBE was updated some from the draft.**
   2. Mentor: <https://mentor.ieee.org/802.18/dcn/19/18-19-0163-00-0000-fcc19-138-nprm-revisiting-use-of-the-5-850-5-925-ghz-band.docx>
   3. **Proceeding 19-138:**
   4. <https://www.fcc.gov/ecfs/search/filings?proceedings_name=19-138&sort=date_disseminated,DESC>
      1. There has been lots of filings already even though the NPRM has not been published in the federal register yet.
   5. Some history to keep in mind, 2006 was FCC original R&O, and it then became practical in about 2010.
      1. And to keep in mind the spectrum has been available since '98, but the FCC delayed for several years and 802.11p wasn't ready until after 2010 so products finally started showing up after 2010s. Because a mandate was written but never issued, the OEMs did not move forward due to uncertainty. Slow implementation has not been due to technical reasons, but administrative.
   6. This will be tricky for 802.11 since some members are working on .11bd need more spectrum for ITS functionality than the NPRM has, although many 802.11 members like the NPRM proposals as is.
   7. A member reports from 802.11bd they have had two sessions so far and are drafting comments as for sure the NPRM impacts their work. They are open and will accept any inputs
      1. Based on last night’s discussion at the IEEE 802.11 TGbd meeting (EVE1), working draft comments has been updated and uploaded: “Draft TGbd Comments on FCC NPRM Docket 19-138” <https://mentor.ieee.org/802.11/dcn/20/11-20-0104-01-00bd-draft-tgbd-comments-on-fcc-nprm-docket-19-138.docx>,
   8. Reviewed rev02 that was just posted.
   9. The base line of the working draft is from previous and approved IEEE 802 comments filed on previous dockets.
   10. With that we reviewed the marked-up changes and added notes to be considered.
       1. Later found out some of the black text was also updated.
   11. One note to mention we want to represent IEEE 802 and IEEE 802.11 as a whole, so how to partition the 75MHz, considering Wi-Fi and DSRC both being 802.11 standards.
   12. The lean is similar to the 6 GHz challenges, to not say specifically, but here is what we have that the standards will provide.
   13. We're in a special situation now. There were lots of previous discussions on sharing and 2 proposals came out of that including the re-banding proposal.
       1. All understand there are different points of view and maybe 802.18 should remain silent on the partitioning of the band.
          * 1. Silence seemed okay but would like the text on pg 4 section IV for support of the full band to be reworded to not mention the full 75 MHz for ITS. This was acknowledged by the author as the point was meant to be 802.11 as a whole and will make use of the full 75 MHz spectrum and the text will be clarified.
   14. To achieve traffic safety will need more spectrum not less as proposed by NPRM. Need to work on this more.
   15. Some concern brought up that there is text actually promoting 5G. It was acknowledged to tone that down and it will be re-worded to more accurately reflect the situation.
   16. For backward compatibility - not everyone understands the difference between co-existence, compatibility and interoperability. .11bd has agreed on definitions of co-ex, compatibility and interop and those have been incorporated in the doc.
       1. A point here is the FCC needs to reference a published standard, but if the .11bd comes out next year, then how does that get reflected in the FCC rules?
       2. Also wants to point out that co-ex is not the right word here. One use is for safety the other for unlicensed. they are not equal functions.
   17. Choosing LTE V2X as the V2X technology does not speed up the market adoption of V2X.
   18. There are many more pieces from the detailed discussions. Here is link of what was uploaded at this time, there will be later revisions of this:
       1. <https://mentor.ieee.org/802.11/dcn/20/11-20-0104-03-00bd-draft-tgbd-comments-on-fcc-nprm-docket-19-138.docx>
   19. Next 802.11bd will work on this updated working draft with these inputs and at the 802.18 meeting on Thursday will review any further updates.
   20. See agenda later slides for details and some historical points discussed previously.
4. **Chair presents slide 23-24, General discussion items** 
   1. Ofcom consultation on changes to the licence exemption for Wireless Telegraphy Devices, LMSC ballot started 6th, with processes to get it going. Some editorial edits requested; ballot has passed with early close.
      1. Plan to email this afternoon, the 14th or tomorrow.
   2. National Body adoption of IEEE standards.
      1. IEEE SA has created a new program that will be implemented in the first quarter of 2020. The program will be a more streamlined process for National Body adoption of IEEE standards. The non-editable template agreement will permit country-specific changes and translations. Countries would be able to adopt IEEE standards as national body standards, and include changes they would like to make that, for example, might include changes due to geography, infrastructure, regulatory requirements, etc. In order to determine which standards will be available under this program, IEEE SA will need your input on whether there are standards developed under your Standards Committee where country-specific changes could substantially impact the standard's implementation worldwide (e.g., functionality or interoperability). Please inform your Program Manager by 24 January 2020 of any relevant standards.
      2. At this point LMSC members responding are not for this and we are heading to not participate.
      3. General feedback from 802.18 teleconference attendees is the some, not to participate
5. **Chair presents slide 25, Topics covered in Teleconferences since Nov.** 
   1. Have had 2 approvals
      1. ACMA compliance priorities 20-21
      2. Ofcom changes to license exempt
   2. EU happenings in general, BRAN, SE45 and FM57 the focus.
   3. WRC-19 wrapped up, didn’t get all we were hoping for, a detailed summary is available, would like to do a high-level summary table, but 5.9 GHz NPRM has taking priority.
   4. WRC-23 AIs are there and want to get to them after the 5.9 GHz issue.
   5. FCC 6GHz proceeding lots of filings, looking like March open meeting now, better stated it won’t be January and not looking like February.
      1. Utility industry has filed an ex parte regarding their meeting with the FCC on this proceeding showing the RLAN interference will be unacceptable to the 6 GHz incumbents and that the Wi-Fi community has been using incorrect assumptions in their analysis.
   6. FCC general activities, 3.7 GHz, fixed mobile service, 2.5 GHz, digital divide low income,
   7. ISED published update to RSS-210
   8. Japan MIC survey <1GHz
   9. IEEE-EU spectrum position paper may come back to review
6. **Chair presents slide 26, Actions / AOB / Recess**
   1. Actions required:
      * **5.9 GHz NPRM contributions and inputs on draft.**
   2. Agenda for Thursday
      1. ITU-R M.1450/M.1801 update status
      2. 5.9 GHz NPRM working draft comments
      3. (Depending on time start to look at WRC-23 AIs?)

* 1. AOB before recess to Thursday AM1.
     1. None heard.
  2. Recessed until Thursday AM1(8:30 local), at 12:08 local

1. **Chair presents 27, Thursday, 16 Jan 20, Agenda**
   1. **Chair called to order at 08:33 local**
   2. **Reminder we are still under all IEEE policies as shown on Tuesday.**
      1. Attendance server is open.
   3. **Remember to state your name, affiliation, employer and/or clients first time you speak.**
      1. Someone to take a few notes: Hassan Yaghoobi (Intel)
      2. Reminder there is no 802.18 reciprocal credit from other WGs.
   4. **Items from Tuesday or new**
      1. ITU-R M.1430/M.1802 status
      2. 5.9 GHz NPRM
   5. Any updates to the agenda? \_none heard\_
   6. **Actions Required**
   7. **AOB**
   8. **Adjourn**
2. **Chair presents slide 28, ITU-R M.1450/M.1801 status**
   1. **Update needed on ITU-R M.1450 (Characteristics of broadband RLANs) (and M.1801)**
   2. 802.11 Ad Hoc is meeting this week.
      1. See: <http://www.ieee802.org/11/email/stds-802-11/msg04021.html> for 802.11 Ad Hoc info.
   3. **And see for the information for this week, with summary:** 
      1. <https://mentor.ieee.org/802.11/dcn/20/11-20-0184-01-0itu-overview-of-target-itu-recommendations-and-outline-of-required-updates.pptx>
      2. Recommendation ITU-R M.1450-5: Characteristics of broadband radio local area networks (02/2014)
         1. Table 2: “Characteristics including technical parameters associated with broadband RLAN standards” Need to add new STDs and update to the previous STDs (references, 5.1GHz, etc.)
         2. Annex 1: “Obtaining additional information on RLAN standards” needs updates
         3. Annex 2 TABLE 3: “General technical requirements applicable in certain administrations and/or regions” Recommend no update for now; to be done by 5A directly
      3. Recommendation ITU-R M.1801-2: Radio interface standards for broadband wireless access systems, including mobile and nomadic applications, in the mobile service operating below 6 GHz (02/2013)
         1. Annex 1: “Broadband radio local area networks” may need update (TBD)
         2. Annex 1: “1 IEEE 802.11” needs updates; Consider removing detailed bands or frequency ranges; like other technologies up-level to high-level ranges
         3. Annex 9 TABLE 5: “Key technical parameters” add key technical parameters for the new IEEE 802.11 STDs
      4. Plan to get recommendation to 802.18 for review at the March Plenary.
3. **Chair presents slides 29-30, 5.9 GHz NPRM**
   1. We looked at but did not review in detail the latest updates to the working draft comments from 802.11bd
      1. <https://mentor.ieee.org/802.11/dcn/20/11-20-0104>
   2. Instead we had more open discussion
   3. An input was to agree on a few areas between .11 and .18 and transpose the work in .11bd to specific comments on focus areas. And respond to questions in the NPRM.
   4. Was an input the NPRM is the best we can get we should support it.
   5. With chairs of .11 and .18 present, need to look at 802 as a whole and focus on what we can agree on, pass on what we don’t have agreement on,
   6. The areas to focus on:
      1. OOBE
      2. 30MHz for ITS (includes safety, advocate DSRC…)
      3. Standards terminology, important to bring up and clarify.
      4. 802.11-2016 is an open standard, and meets government rules that must be a published stds. (can request FCC later to update to latest published stds.)
   7. Also it came up can the lower 45 MHz be used for other ITS services, (e.g. non-safety)?
   8. **Starting to look at 4 focus areas:**
   9. **OOBE**
      1. Text is being worked on, 1-2 weeks out. There are some choses and details that need to be worked through.
      2. Can we challenge the -27dB/MHz? No question in NPRM is asking about that, however.
      3. Needs more analysis. (studies by NTIA before) (in-car WiFi systems will wipe out the 30MHz).
      4. With that unlicensed cannot interfere with licensed ITS.
      5. Could work on answer to NPRM on the same slope line from U-NII3?
   10. **30MHz for ITS (includes safety, advocate DSRC…)** 
       1. Can the 45 MHz un-licensed be used for some ITS applications? Yes.
          1. This will help as .11bd was planning on more than 30MHz, and need to review the split.
          2. Note there is likely going to be interference from Radar and satellite
       2. There is text in the BD doc, will adjust per discussion today.
   11. **Standards terminology**
       1. BD doc has this.
   12. **802.11-2016 is an open standard, and meets government rules, must be a published stds. (could request FCC later to update to latest published stds.)** 
       1. Actually, maybe can reference 802.11-2020 depending on timing of when the R&O does come out.
       2. How can we bring up .11bd and .11ax technology that is coming, backward compatible?
       3. Could do an ex parte later, though some feedback R&O could likely come out before 2020 election, then timing won’t work well.
   13. Need to be cautious of the timeline, even though the 30-day comment period has not started it could anytime and we need around 10-14 days to get through approval process, after comments are done.
4. **Chair presents slide 31, Actions required** 
   * **Comment contributions for 5.9 GHz NPRM**
   1. Soon (after 5.9 GHz):

* **Start to consider what are IEEE 802 viewpoints are for WRC-23 agenda items.** 
  1. Ongoing:
     1. WPT use of license-exempt bands and UWB in cell phones
     2. Digital Divide, how can we help?

1. **Chair presents slide 32 Any Other Business**
   1. March plenary/Atlanta registration is open, elections and 40th anniversary.
   2. Straw Polls
      1. How many people would like to come back to this venue?
      2. Yes- 12
      3. No - 3
   3. Liked the Social – 10
   4. Disliked the Social – 2
   5. Did not go to Social – 8
2. **Chair presents slide 33, Adjourn**
   1. Next teleconference: 23Jan2020 – 15:00 – <15:55 ET
      1. Call in info: <https://mentor.ieee.org/802.18/dcn/16/18-16-0038-14-0000-teleconference-call-in-info.pptx> (or latest)
      2. All late changes/cancellations will be sent out to the 802.18 listserver.
   2. Adjourn:
      1. Agenda complete, any objection to Adjourn.
      2. None heard, Adjourn at 09:59 local.
   3. Next Plenary:
   4. The next face to face meeting (after next week) of the 802.18 RR-TAG will be at the IEEE 802, 15-20 March 2020 Plenary in Hilton Atlanta, Atlanta, GA, USA
   5. Normal time slots, Tuesday AM2 and Thursday AM1 (8:30 start)–remember no reciprocal from other WGs
   6. **Thank You and Safe Travels**

Meeting attendance for RR-TAG (Tuesday, 14-Jan-2020, AM2 10:20 - 12:30) – 40 attendees, 24 voters

|  |  |  |  |
| --- | --- | --- | --- |
| Last Name | First Name | Current Involvement Level | Affiliation |
| Bender | Klaus | Observer | Utilities Technology Council |
| Berkema | Alan | Observer | HP Inc. |
| Boldy | David | Voting Member | Broadcom Corporation |
| Clanney | Nathan | Observer | Siemens Mobility, Inc. |
| de Vegt | Rolf | Voting Member | Qualcomm Incorporated |
| Ecclesine | Peter | Voting Member | Cisco Systems, Inc. |
| Gagne | Michael | Observer | AURA Network Systems |
| Godfrey | Tim | Voting Member | Electric Power Research Institute, Inc. (EPRI) |
| Hiertz | Guido | Voting Member | Ericsson GmbH |
| Holcomb | Jay | Voting Member | Itron Inc. |
| Ikegami | Tetsushi | Voting Member | Meiji University |
| Inoue | Yasuhiko | Voting Member | Nippon Telegraph and Telephone Corporation (NTT) |
| Jeffries | Timothy | Voting Member | Huawei Technologies Co. Ltd |
| Jones | Vincent Knowles IV | Voting Member | Qualcomm Incorporated |
| Juntunen | Juha | Observer | Meteor Communications Corp. |
| Kain | Carl | Voting Member | Noblis, Inc. |
| Kenney | John | Voting Member | TOYOTA InfoTechnology Center U.S.A. |
| Kerry | Stuart | Voting Member | OK-Brit |
| Lepp | James | Voting Member | BlackBerry |
| Li | Huan-Bang | Voting Member | National Institute of Information and Communications Technology (NICT) |
| Lynch | Michael | Voting Member | MJ Lynch & Associates, LLC. |
| Nelson | Kathleen | Observer | Ondas Networks |
| Palm | Stephen | Voting Member | Broadcom Corporation |
| Palmer | Clark | Observer | Meteorcomm LLC |
| rocha | alessandra | Observer | Wimax forum |
| Salazar Cardozo | Ruben E | Voting Member | Landis+Gyr AG |
| Sand | Stephan | Voting Member | German Aerospace Center (DLR) |
| Sarris | Ioannis | Voting Member | u-blox |
| Schiessl | Sebastian | Observer | u-blox |
| Serang | Daoud | Observer | CML Microcircuits |
| Shaul | yossef | Observer | Autotalks |
| Sherlock | Ian | Voting Member | Texas instruments |
| Smith | Frederick | Observer | Chevron Corporation |
| Smith | William | Observer | BNSF Railway |
| Tanigawa | Masaya | Observer | Buffalo Inc. |
| Tedrow | Craig | Observer | General Electric |
| Verso | Billy | Voting Member | DecaWave |
| Wang | Lei | Voting Member | Huawei R&D USA |
| Ward | Lisa | Aspirant Member | Rohde & Schwarz |
| YAGHOOBI | HASSAN | Voting Member | Intel Corporation |

Meeting attendance for RR-TAG (Thurs, 16-jan-20120, AM1 08:30 - 10:00) \_27\_ attendees, 23\_ voters

|  |  |  |  |
| --- | --- | --- | --- |
| Last Name | First Name | Current Involvement Level | Affiliation |
| Bender | Klaus | Observer | Utilities Technology Council |
| Boldy | David | Voting Member | Broadcom Corporation |
| de Vegt | Rolf | Voting Member | Qualcomm Incorporated |
| Godfrey | Tim | Voting Member | Electric Power Research Institute, Inc. (EPRI) |
| Hiertz | Guido | Voting Member | Ericsson GmbH |
| Holcomb | Jay | Voting Member | Itron Inc. |
| Ikegami | Tetsushi | Voting Member | Meiji University |
| Inoue | Yasuhiko | Voting Member | Nippon Telegraph and Telephone Corporation (NTT) |
| Jeffries | Timothy | Voting Member | Huawei Technologies Co. Ltd |
| Jones | Vincent Knowles IV | Voting Member | Qualcomm Incorporated |
| Kain | Carl | Voting Member | Noblis, Inc. |
| Kenney | John | Voting Member | TOYOTA InfoTechnology Center U.S.A. |
| Kerry | Stuart | Voting Member | OK-Brit |
| Lansford | James | Voting Member | Qualcomm |
| Lepp | James | Voting Member | BlackBerry |
| Li | Huan-Bang | Voting Member | National Institute of Information and Communications Technology (NICT) |
| Lynch | Michael | Voting Member | MJ Lynch & Associates, LLC. |
| Palm | Stephen | Voting Member | Broadcom Corporation |
| Sand | Stephan | Voting Member | German Aerospace Center (DLR) |
| Sarris | Ioannis | Voting Member | u-blox |
| Schiessl | Sebastian | Observer | u-blox |
| Serang | Daoud | Observer | CML Microcircuits |
| Shaul | yossef | Observer | Autotalks |
| Sherlock | Ian | Voting Member | Texas instruments |
| Stanley | Dorothy | Voting Member | Hewlett Packard Enterprise |
| Verso | Billy | Voting Member | DecaWave |
| YAGHOOBI | HASSAN | Voting Member | Intel Corporation |