IEEE 802.18

Radio Regulatory-TAG

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| Radio Regulatory Technical Advisory Group Minutes | | | |
| Date: 07oct21 | | | |
| Name | Affiliation | Address | Email |
|  |  |  |  |
| Author and Officer presiding: | | | |
| Jay Holcomb,  Chair, RR-TAG | Itron | Liberty Lake, (Spokane) WA | jholcomb@ieee.org |

Co-Vice-chairs are [Al Petrick (Skyworks Solutions)](mailto:apetrick@ieee.org) and [Stuart Kerry (OK-Brit/Self)](mailto:stuart@ok-brit.com)

Abstract

Minutes of the IEEE 802 RR-TAG teleconference

These are the Minutes of the IEEE 802 RR-TAG teleconference Thursday, 07oct21

1. Chair calls the meeting to order at 15:02 et
2. Chair presents slides 2 – 6 of 802.18-21/0122r01, the call to order and administrative items
   1. Includes IEEE 802 meeting and participant’s guidelines and requirements.
3. Chair presents slides 7, the agenda:
   1. Call to Order
      1. Attendance is not on IMAT (w/VC & webex)
      2. Remember to mute when not speaking, thanks.
      3. Please request Q in the chat window.
   2. Administrative items
      1. Someone to take some notes, Peter E
      2. Attendance & monitor chat window, Stuart K
   3. Approve agenda, last minutes & announcements.
   4. Discussion items
      1. ITU-R WP 5A liaisons ballot
      2. ITU-R Items
      3. EU Items
      4. Other Regions Items
      5. General Discussion Items
   5. Actions required.
      1. Start EC approvals on WP 5A Liaisons if approved
      2. Anything new today
      3. ongoing: WRC-23 AI Viewpoints & Freq. table fill in
   6. AOB
   7. Adjourn
4. Chair presents slides 8 - 9 Administrative – Motions and more
   1. **Motion: To approve the agenda as presented on previous slide**

Moved by: Stuart Kerry (OK-Brit, self)

Seconded by: Hassan Yaghoobi (Intel)

Discussion? None

Vote: Approved by unanimous consent

* 1. **Motion:** To approve the minutes in document <https://mentor.ieee.org/802.18/dcn/21/18-21-0121-00-0000-minutes-30sep21-rrtag-teleconference.docx> 01-Oct-2021 09:59:35 ET, with editorial privilege for the 802.18 chair.

Moved by: Al Petrick (Skyworks)

Seconded by: Ben Rolfe (Blind Creek Assoc)

Discussion? None

Vote: Approved by unanimous consent

* 1. **Administrative moving forward** 
     1. For **Nov 2021** Plenary – (was Vancouver) – EC call on 07Sep21 approved to be electronic/virtual.
        1. Also approved was the $50 / $75 / $125 meeting fee like we have been doing.
        2. **Early Registration: Until Thursday 11:59 PM UTC October 21, 2021** \* $US 50.00 for all attendees
        3. Standard Registration: Until Friday 11:59 PM UTC November 5, 2021 \* $US 75.00 for all attendees
        4. Late Registration: After Friday 11:59 PM UTC November 5, 2021 \* $US 125.00 for all attendees
        5. Registration Fees are Non-Transferable and Non-Refundable
        6. **REGISTRATION WEBSITE:** [**https://cvent.me/4xn8Ql**](https://urldefense.com/v3/__https:/cvent.me/4xn8Ql__;!!F7jv3iA!mIj7hYJYj38R6agYT--N_zFo-0q_cZUBHvvk_La3dCCECpGaAxZZLZ_IZg53vVm76Q$)
        7. Meetings will take place between November 5-19, 2021.
        8. The dates and times of specific WG and TAG meetings will be provided by the Working Group Chairs.
        9. Information is available at <https://ieee802.org/802tele_calendar.html>
        10. .18 at this point will be our normal weekly times and call-in, Thursday's 11th and 18th Nov21.
     2. For **Jan 2022 Electronic Wireless Interim – (was Panama)** - Opening is Friday 14Jan21 10:00et
        1. WCSC Sept. call, the Jan 2022 Wireless Interim will be electronic/virtual.
        2. Also approved was the $50 / $75 / $125 meeting fee like coming up at the Sept. Wireless Interim
        3. .18 will be our normal weekly times and call-in, Thursday’s 20th and 27th Jan21, and will have voting participation credit.
     3. For **March 2022** Plenary – Orlando
        1. Decision point will be EC call 07dec21.
        2. Will have a poll during November plenary like before, if it is a face-to-face would you go?

1. Chair presents slides 10 - 11, **EU items to share**
   1. General EU info: [<ojeu>](https://eur-lex.europa.eu/oj/direct-access.html) [<HStds>](https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/) <https://www.etsi.org/deliver/etsi_en/>
      1. Remember – BRAN documents can be found in the 802.11 private area documents (daily refresh)
         1. for reference, ad hoc meetings can make decisions, rapporteur meetings cannot.
   2. **ETSI –** [<BRAN>](https://portal.etsi.org/tb.aspx?tbid=287&SubTB=287) **next meeting #111 27sep-01oct21;** 
      1. Anything to share today? yes
         1. Had a compromise on 6GHz, EN 303 687. see BRAN (21)111033r3. NB FH would be included in the standard. Will continue discussions on channel access requirements.
         2. There are 10 ad hoc meetings before the next plenary, 3 of the them on the NB FH discussion.
         3. EN 301 893 5 GHz had a nice cleanup of the standard.
         4. Now a rapporteur for TR 103 721 5.8 GHz coexistence
         5. EN 303 753 3rd 60GHz std. to address the C2 band. discussion LBT or beam forming antennas,
         6. EN 303 722 2nd 60GHz ENAP still ongoing
         7. BRAN is working on dates for 2023 and 2024 meetings.
         8. EN 301 598 TVWS in EC assessment. Results are in and waiting for them to be shared.
         9. Administrations were clear to get the 6GHz std out soonest.
         10. User Access Restrictions are pretty much agreed upon for 5 and 6 GHz, on the heels of TVWS.
      2. 16sep: One of the 60GHz standards, EN 303 753, rapporteur meeting on 21sep21
         1. Agenda for #111 is on the BRAN site and the 802.11 members area.
      3. 09sep:
         1. EN 301 598 – TVWS – approved and next is EC assessment. then to ENAP and heading for the OJEU.
         2. EN 301 893 5 GHz - had 2 calls, cleaning up the standards. Working to conclude in meeting #112 in Dec.
         3. EN 303 687 6 GHz - have had 3 ad hoc meetings, 1 was on client-to-client communications with some values still being discussed. 2 were on NB FH and discussions continue.
         4. EN 303 753, 1 of the 60GHz stds has a call today/10th and then #2 is 21sep21
         5. EN 303 722 another 60GHz standard is waiting on ENAP.
         6. (not discussed though: EN 302 567 – another 60GHz (.11ad and .11ay) has passed 2nd ENAP, it is now an approved standard, next is to EC to approve for the OJEU.)
         7. Next plenary starts on 27sept. Looking at 4 – 90min sessions each day.
      4. after the call, for next week: 2 rapporteur meetings on 13&20oct21, to discuss HS EN 303 687 and NB FH w/adaptivity (LBT)
   3. **CEPT –** [**<ECC>**](https://cept.org/ecc/groups/ecc/client/introduction/) **(and more) next calls, #57 02-05Nov21**
      1. after the .18 call, so for next week, ECC will take up discussion of a WI on upper 6GHz for RLAN.
   4. **CEPT–ECC** [**<SE24>**](https://cept.org/ecc/groups/ecc/wg-se/se-24/client/introduction/) **next virtual meeting, #M105 10-12Jan22**
      1. Anything to share today? nothing today
      2. 16sep: ECC report 327 is back from public review and will be will agreed upon at next SE meetings. Proposed changes will be in the regulations, just how is tbd. Expected by early 2022.
      3. 02sep: Looking at UWB radiodetermination applications in 116 – 260GHz for vehicular use.
   5. **CEPT – ECC** [**<SE45>**](https://cept.org/ecc/groups/ecc/wg-se/se-45/client/introduction/) **next call #14 28-29Oct21**
   6. Anything to share today? yes, Last time only took 1st day, may happen again. Be there on 28th if you want to hear what is going on.
   7. **CEPT – ECC** [**<WGFM>**](https://cept.org/ecc/groups/ecc/wg-fm/client/introduction/)  **next web meeting #100 04-08Oct21**
      1. At the end of the WGFM meeting, 08Oct21, FM 57 will be dissolved.
   8. **CEPT – ECC** [**<FM57>**](https://cept.org/ecc/groups/ecc/wg-fm/fm-57/client/introduction/) **last call #16 14-15Sep21; next call: \_n/a \_**
      1. **Will remove FM57 from agenda after today, as it is to be dissolved in a few hours.**
      2. 16sep: 1) Resolution of public consultation comments on Draft ECC report 330; re: WAS/RLAN use of the 5725-5850MHz band (CEPT work item FM57\_03).
         1. Output of the resolution meeting [TEMP01R3](https://urldefense.com/v3/__https:/cept.org/ecc/groups/ecc/wg-fm/fm-57/client/meeting-documents/file-history/?fid=66192__;!!F7jv3iA!mCTImXbqHUEmXdRE-Le21C7Pv9EfUbqFt7Qxar2NoKB6LSyy2y7L_Bb1pSadyKV1TA$) will be sent to the next WGFM meeting.
         2. 2) A request from WGFM on how to establish a list of countries that either do or do not permit the use of the band 5725-5850 MHz above 25mW EIRP for the purposes of CDC operation.
         3. [TEMP02R2](https://urldefense.com/v3/__https:/cept.org/ecc/groups/ecc/wg-fm/fm-57/client/meeting-documents/file-history/?fid=66233__;!!F7jv3iA!mCTImXbqHUEmXdRE-Le21C7Pv9EfUbqFt7Qxar2NoKB6LSyy2y7L_Bb1pSbuZpWorA$) approved at FM57 and sent to WGFM in response detailing a template that could be used as part of an ECO table for enabling CDC operation whilst protecting incumbent services in countries where CDC is not allowed.
         4. The work that FM57 was created for (e.g. 6GHz Regulation and 5.8GHz ECC report) is now complete and the FM57 group will be closed at the next WGFM meeting.
   9. nice site: CEPT 6 GHz status across the countries: <https://docdb.cept.org/implementation/16737>
2. Chair presents slides 13, **Other regions (outside EU-Stds and USA), items to share**
   1. Tunisia – ANF – has a public consultation on allocating the lower part of the 6GHz band , 5925-6425Mz for WLAN. Comments due 30oct21.
      1. There are 4-5 questions, also includes asking about the upper band to 7125MHz, for the full 1200 MHz.
   2. Anything else to share today? nothing heard
   3. **reminders**
   4. **Malaysia MCMC has recently begun a public consultation that seeks public view on the possibility of allocating 6 GHz spectrum to unlicensed use.**
      1. Malaysia MCMC has recently begun a public consultation that seeks public view on the possibility of allocating 6 GHz spectrum to unlicensed use.
         1. Deadline for submitting comments is 5:00pm Selangor Darul Ehsan local time, **October 11, 2021. (23sept out of .18)**
         2. For details, you would refer to the 15-page document at:
         3. <https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/PC_WiFi.pdf>
         4. Consultation is in mentor: <https://mentor.ieee.org/802.18/dcn/21/18-21-0103-00-0000-malaysia-mcmc-consultation-wlan-in-the-6ghz-band.docx>
      2. Brazil – ANATEL - Public Consultation 46
         1. This public consultation aims to reassess the limits of undesirable emissions from very low power devices operating in the 5,925 MHz to 7,125 MHz band.
         2. The deadline for submission of comments is 30th November 2021. For more information on this public consultation, please refer to this [link](https://sistemas.anatel.gov.br/SACP/Contribuicoes/TextoConsulta.asp?CodProcesso=C2513&Tipo=1&Opcao=andamento) and is in Portuguese language only.
3. Chair presents slides 13-15, **ITU-R items to share**
   1. Status on Liaison to ITU-R WP 1A on VLC, the EC approved on Tuesday. Wednesday did have an editorial request from an EC member which will be done. Then will make clean copy for Mentor and the ITU-R liaison to upload to WP 1A.
      1. Will do quick review of editorial: [https://mentor.ieee.org/802.18/dcn/21/18-21-0109-07-0000-liaison-response-to-itu-r-wp-1a-on-vlc-standards.docx](https://mentor.ieee.org/802.18/dcn/21/18-21-0109-06-0000-liaison-response-to-itu-r-wp-1a-on-vlc-standards.docx)
   2. Anything else to share? nothing heard
   3. **WRC-23 agenda items, the list is on the ITU-R website at:** 
      1. <https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-23-studies.aspx> (updated 26Aug20)
         1. <https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000D0041PDFE.pdf>
         2. <https://mentor.ieee.org/802.18/dcn/20/18-20-0107-01-0000-res-811-wrc-19-wrc-23-agenda-items.docx>
   4. **IEEE 802 viewpoints on WRC-23 agenda items.** 
      1. Doc for viewpoints updated (actions items in notes on this slide in agenda): <https://mentor.ieee.org/802.18/dcn/21/18-21-0039-01-0000-ieee-802-viewpoints-on-wrc-23-agenda-items.pptx>
      2. Soon, will review actions noted at the July Plenary. y.
      3. Reference:
         1. btw- the initial AIs to consider IEEE 802 viewpoints:
            1. 1.1 -800-4 990 MHz and Resolution 223. Connection w/ITS going there?
            2. 1.2 -300-3 400MHz, 3 600-3 800MHz, 6 425-7 025MHz, 7 025-7 125MHz and 10.0-10.5GHz for International Mobile Telecommunications (IMT) and resolution 245.
            3. 1.5 -470-960 MHz in Region 1-consider possible regulatory actions, Resolution **235.**
            4. 10 **-**recommend to the Council items for inclusion in the agenda for the next WRC
   5. For miscellaneous links for ITU-R, SGs, WPs and calendars, see back up slides later.
   6. **Liaison from ITU-R WP5A re: M.1801-2, see** **<https://mentor.ieee.org/802.18/dcn/21/18-21-0058-00-0000-request-for-input-itu-r-m-1801-2.docx>**
   7. **Liaison from ITU-R WP5A re: M.1450-5, see** **<https://mentor.ieee.org/802.18/dcn/21/18-21-0057-00-0000-request-for-input-itu-r-m-1450-5.docx>** 
      1. WP 5A next meeting is 15-26nov21 (probably upload to WP5A 26oct21; **out of .18 then 07oct** for EC 10 day)
         1. **Deadline for contribution 1600 hours UTC Monday, 8 November 2021**
      2. Documents 57 and 58 are assigned to the ITU ad hoc group for processing. ad hoc has met on these.
      3. **and from there the liaison contributions have been uploaded now to .18 mentor and .18 will vote on them today, 07oct.**
      4. <https://mentor.ieee.org/802.18/dcn/21/18-21-0116-02-0000-proposed-modifications-to-itu-r-m-1450-5.docx>
      5. <https://mentor.ieee.org/802.18/dcn/21/18-21-0117-02-0000-proposed-modifications-to-itu-r-m-1801-2.docx>
      6. Will review and have r03 clean versions for approval pending any other updates.
   8. **ITU-R liaisons – Motion for ITU-R M.1450 & M.1801 submissions**
      * 1. **Motion:** Move to approve documents [https://mentor.ieee.org/802.18/dcn/21/18-21-0116-0](https://mentor.ieee.org/802.18/dcn/21/18-21-0116-01-0000-proposed-modifications-to-itu-r-m-1450-5.docx)3[-0000-proposed-modifications-to-itu-r-m-1450-5.docx](https://mentor.ieee.org/802.18/dcn/21/18-21-0116-01-0000-proposed-modifications-to-itu-r-m-1450-5.docx) and <https://mentor.ieee.org/802.18/dcn/21/18-21-0117-03>[-0000-proposed-modifications-to-itu-r-m-1801-2.docx](https://mentor.ieee.org/802.18/dcn/21/18-21-0117-00-0000-proposed-modifications-to-itu-r-m-1801-2.docx) for ITU-R M.1450-5 and M.1801-2 updated edits, respectively. For review and approval by the LMSC (EC) for submission to ITU-R WP 5A via ITU-R Liaison before contribution deadline for WP 5A’s next meeting. The Chair of 802.18 is authorized to make editorial changes as necessary.
        2. **Voters: \_14\_** (w/chair)
        3. **\_17\_** on the call
        4. **Moved by:** Hassan Yaghoobi (Intel)
        5. **Seconded by:** Dorothy Stanley (HPE)
        6. **Discussion?** none
        7. **Vote: \_13\_Y / \_0\_N / \_0\_A**
        8. **Motion - Passes**
4. Chair presents slides 16 - 17, **General Discussion Items**
   1. **FCC NOI on Spectrum Requirements for the Internet of Things**
      1. The Commission adopted a [Notice of Inquiry](https://www.fcc.gov/document/spectrum-requirements-internet-things) seeking comment on current and future spectrum needs to enable better connectivity relating to the Internet of Things (IoT). (ET Docket No. 21-353)
         1. <https://docs.fcc.gov/public/attachments/DOC-375610A1.pdf>
         2. In mentor: <https://mentor.ieee.org/802.18/dcn/21/18-21-0108-01-0000-fcc-noi-on-spectrum-for-the-internet-of-things.docx>
      2. **Dates have been set: Comment Date: November 1, 2021**; **Reply Comment Date: November 16, 2021**
      3. **802.18 would need to approve 14oct21, next week.**
      4. **Some questions maybe of interest to IEEE 802, e.g.,**
         1. please refer to portions of paragraph 6 re IEEE: Standards groups such as 3GPP, IEEE, and others are also involved with IoT development. Are these standards providing sufficient guidance for IoT implementation in already existing spectrum bands?
            1. If the growing need for IoT connectivity is not being met with the current and planned licensed spectrum resources, what steps can the Commission take to address this important use in the future?
         2. please refer to paragraphs 10 and 11 asking the role of unlicensed spectrum and whether additional unlicensed spectrum should be considered.
      5. Can someone get some text together and we could have some ad hocs next week? no response
   2. **FCC NPRM on 60GHz on Radar Sensing Technology** 
      1. Allowing Expanded Flexibility and Opportunities for Radar Operation in the 57-64 GHz band
         1. Proceeding: [https://www.fcc.gov/ecfs/search/filings?q=((proceedings.name:((21%5C-264\*))%20OR%20proceedings.description:((21%5C-264\*))))&sort=date\_disseminated,DESC](https://www.fcc.gov/ecfs/search/filings?q=((proceedings.name:((21%5C-264*))%20OR%20proceedings.description:((21%5C-264*))))&sort=date_disseminated,DESC)
         2. It is on Mentor: r02 is the July OET versions (r01 is the later Federal Register version). <https://mentor.ieee.org/802.18/dcn/21/18-21-0079-02-0000-fcc-nprm-allowing-expanded-flexibility-for-radar-operation-in-57-64-ghz-band.docx>
         3. Reply comments due 18Oct21, draft reply comments are at: <https://mentor.ieee.org/802.18/dcn/21/18-21-0110-08-0000-reply-comments-of-ieee-802-60-ghz-motion-sensing-fcc-nprm-et-21-264.docx>
      2. **EC Ballot started last Friday,** 
         1. One EC member requested editorial updates. Updates reviewed and all are okay. Will be posted as rev09.
         2. Currently: 4 approved, 1 disapproved (need 50% return (need 2 more) and 2/3 approval)
         3. Ballot closes next Monday the 11th.
5. Chair presents slide 18, **General Discussion Items – ongoing fyi - MSGs 6 GHz**
   1. The WInnforum “6 GHz Committee”, all groups meet every 2 weeks except interference-weekly (168 people)
      1. <https://www.wirelessinnovation.org/6ghz-multistakeholder-committee>
      2. For access to documents from the committee, can request to be an observer from MSG below.
      3. New org: 2 (now) focus areas:
         1. ) AFC Functional Specification -WG – includes: Interference-TG, Incumbent Info-TG, security (new) and Protocols 3GPP-TG
         2. 2) AFC Test and Certification-WG
      4. Anything to share this week? yes. WInnforum met with FCC and WBT and delivered report RC-1010, and asking FCC when will the ULS database be updated? and answer was don’t know. could be late 2022 and maybe into 2023.
      5. **16sep:** The members of the Wireless Innovation Forum have balloted and approved a new document entitled “Recommendations for Addressing Blank, Uncollected, Erroneous, or Conflicting Database Elements for Incumbent Systems in the U.S. U-NII 5 & 7 Bands for the Purpose of Automated Frequency Coordination Systems” (document number WINNF-RC-1010-V1.0.0). This document and the associated appendix are publicly available here: <https://6ghz.wirelessinnovation.org/work-group-products>
   2. 2. From the FCC R&O, an informal MSG (“Group”) has also been formed. (260+ people)
      1. <https://groups.wirelessinnovation.org/wg/6MSG/dashboard>.
      2. Work stream 1-interference protection and resolution (CableLabs, EPRI, Lake Cty, APCO) Meets biweekly, from 28Jan21-10:00 et,
      3. Work stream 2 - correct incumbent data (ULS) (Comsearch, APCO)
      4. Work stream 3 - AFC and how it provides protection, etc. (Charter, Google, UTC)
      5. Overall Co-chairs: NPSTC, UTC, WFA, WISPA.
      6. Anything to share this week?
      7. **23sep:** Work stream 1 – draft final report is still in 0.x revs, indicating the final v1.0 is a ways out and the schedule is heading right.
         1. This group met last week 24Sept21
6. Chair presents slide 19, **General Discussion Items – ongoing fyi - Table of IEEE 802 Stds Frequency Ranges**
   1. **Problem statement**
      1. It is difficult for 802 wireless standards developers to quickly and accurately identify all the frequency bands by the family of 802 wireless standards in a regularly maintained database.
      2. The primary application is to simplify identification of potential frequency bands for coexistence assessment.
   2. **Initial Audiences:** 
      1. 1) 802 wireless standards developers
      2. 2) 802.19 wireless coexistence working group
   3. **Ad hoc calls** 
      1. **The spreadsheet is going, always look for latest:**
      2. <https://mentor.ieee.org/802.18/dcn/21/18-21-0036-08-0000-frequency-table-template.xlsx>
   4. **From ad hoc call on 28sept21**
      1. Updated most of the 802.15 cells/rows, less UWB ones.
      2. And proposing to swap columns D&E to get the clause numbers for the current standard by the current standards. and clarified what goes in the clause cell.
   5. The activity is entering the phase to fill in the sheet now, so more intense and time consuming.
   6. The **next meeting will be 26oct21.** (call-in in backup slides here)
7. Chair presents slide 20 **Actions Required**
   * **Chair prep and start 10-day LMSC/EC ballot for ITU-R WP 5A Liaisons.**

ongoing:

* + For IEEE 802 viewpoints on WRC-23 AIs, reach out to those identified, looking for input on the viewpoints.
  1. **Proactive Spectrum Sharing – Contact Rich Kennedy if you can help or have inputs. or want to join the task force.**

1. Chair presents slide 21 Any Other Business
   1. none heard
2. Chair presents slide 22, Adjourn.
   1. **Next “weekly” teleconference (sched’d to 13jan22): 14oct –*15:00–<15:55* et** 
      1. Call in info: <https://mentor.ieee.org/802.18/dcn/16/18-16-0038-19-0000-teleconference-call-in-info.pptx>
      2. Also, see back up slide in the agenda.
      3. All late changes/cancellations will be sent out to the 802.18 list server.
   2. Overall IEEE 802 schedule: <http://ieee802.org/802tele_calendar.html>
      1. or 802.18’s: [IEEE 802.18 TAG Calendar](https://calendar.google.com/calendar/embed?src=c2gedttabtbj4bps23j4847004%40group.calendar.google.com&ctz=America%2FNew_York)
   3. Adjourn:
      1. Any objection to Adjourn.
      2. None heard, Adjourn at 15:54et
   4. **The next IEEE 802 plenary will be electronic in November 2021**
   5. **The IEEE 802.18 (wireless) interim will be electronic in Jan 2022**
   6. Thank You
3. Attendance

|  |  |  |  |
| --- | --- | --- | --- |
| **Voting Attendees:** | |  | **7-Oct** |
| **Auluck** | Vijay | Self | **x** |
| **Ecclesine** | Peter | Cisco Systems, Inc. | **x** |
| **Hiertz** | Guido | Ericsson GmbH | **x** |
| **Holcomb** | Jay | Itron Inc. | **x** |
| **Kain** | Carl | USDOT, Noblis, Inc. | **x** |
| **Kerry** | Stuart | OK‐Brit, Self | **x** |
| **Levy** | Joseph | InterDigital, Inc. | **x** |
| **Nikolich** | Paul | Self, HPE, Huawei, Wyebot, UNH BCoE, YAS BBV, Origin Wireless | **x** |
| **Petrick** | Al | Skyworks Solutions Inc. | **x** |
| **Pirhonen** | Riku | NXP Semiconductors | **x** |
| **Rolfe** | Benjamin | Blind Creek Associates | **x** |
| **Stanley** | Dorothy | Hewlett Packard Enterprise | **x** |
| **Yaghoobi** | Hassan | Intel Corporation | **x** |
| **Yucek** | Tevfik | Qualcomm Incorporated | **x** |
|  |  |  |  |
| **Non-Voting Attendees:** | |  |  |
| **da Silva** | Claudio | Facebook | **x** |
| **Fang** | Yonggang | MediaTek | **x** |
| **Jeffries** | Timothy | FutureWei Technologies, Inc. | **x** |