IEEE 802.18

Radio Regulatory-TAG

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| Radio Regulatory Technical Advisory Group Minutes | | | |
| Date: 04nov21 | | | |
| 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, 04nov21

1. Chair calls the meeting to order at 15:02 et
2. Chair presents slides 2 – 6 of 802.18-21/0130r01, 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. EU Items
      2. Other Regions Items
      3. ITU-R Items
      4. General Discussion Items
   5. Actions required.
      1. Anything new today
      2. 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/21/18-21-0129-00-0000-minutes-28oct21-rrtag-teleconference.docx> 29-Oct-2021 15:11:12 ET, with editorial privilege for the 802.18 chair.

Moved by: Al Petrick (Skyworks)

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

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** (<28hrs from when this slide was presented) \* $US 75.00 for all
        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.
        11. On 11th: have overlap with 802.15 TG14 and last 30mins of .11az and .11bh,
     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 will be required.**
        3. .18 will be our normal weekly times and call-in, Thursday’s 20th and 27th Jan21,
           1. **and the .18 chair declares this an accredited interim and will have voting participation credit.**
     3. For **March 2022** Plenary – Orlando
        1. Decision point will be EC call 02dec21.
        2. Will have a mentor epoll during November plenary like before, if it is a in-personwould 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 call #112 13-17dec21; lots of ad hocs (10) before then. (14 total calls)**
      1. Nothing shared.
      2. **28ooct:** BRAN(21)111002r2 and 111036r3 are the keys to knowing which 111x meeting is on which topic. 111j is on both EN 301 893 and EN 303 687. More details below.
         1. Some comments on TVWS, EC working with multiple consultants, with multiple output from them, this is challenging.
         2. ENAP has ended on EN 303 722, one country with technical comments. should be able to resolve okay. meeting is scheduled to resolve then a 2nd ENAP will be needed.
         3. 6 GHz, EN 303 687, discussions continue on NB FH, still trying to understand the compromise made.
         4. 5 GHz going smoothly. Have heard some question on radars thought not to BRAN at this time. Just need to be aware as some specific companies seem to not be following the rules.

• ETSI TC BRAN ad hoc meeting #111a  
 Dedicated to ENAP comment resolution for EN 303 722  
 Proposed agenda in BRAN(21)111a001  
 2021-11-04T09:00+01:00 until 2021-11-04T12:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42763>>  
  
• ETSI TC BRAN ad hoc meeting #111b  
 Dedicated to TS 103 754  
 Proposed agenda in BRAN(21)111b001  
 2021-11-02T09:00+01:00 until 2021-11-02T11:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42764>>  
  
• ETSI TC BRAN ad hoc meeting #111c  
 Dedicated to TS 103 754  
 Proposed agenda in BRAN(21)111c001  
 2021-12-01T09:00+01:00 until 2021-12-01T11:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42765>>  
  
• ETSI TC BRAN ad hoc meeting #111d  
 Dedicated to TR 103 721  
 Proposed agenda in BRAN(21)111d001  
 2021-11-16T10:00+01:00 until 2021-11-16T12:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42766>>  
  
• ETSI TC BRAN ad hoc meeting #111e  
 Dedicated to EN 303 687  
 Proposed agenda in BRAN(21)111e001  
 2021-11-23T09:30+01:00 until 2021-11-23T12:30+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42767>>  
  
• ETSI TC BRAN ad hoc meeting #111f  
 Dedicated to EN 303 687  
 Proposed agenda in BRAN(21)111f001  
 2021-11-30T09:30+01:00 until 2021-11-30T12:30+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42768>>  
  
• ETSI TC BRAN ad hoc meeting #111g  
 Dedicated to EN 303 687  
 Proposed agenda in BRAN(21)111g001  
 2021-12-03T09:30+01:00 until 2021-12-03T12:30+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42769>>  
  
• ETSI TC BRAN ad hoc meeting #111h  
 Dedicated to EN 301 893  
 Proposed agenda in BRAN(21)111h001  
 2021-11-23T16:00+01:00 until 2021-11-23T19:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42770>>  
  
• ETSI TC BRAN ad hoc meeting #111i  
 Dedicated to EN 301 893  
 Proposed agenda in BRAN(21)111i001  
 2021-12-01T15:00+01:00 until 2021-12-01T18:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42771>>  
  
• ETSI TC BRAN ad hoc meeting #111j  
 Dedicated to EN 301 598  
 Proposed agenda in BRAN(21)111j001  
 2021-11-03T09:00+01:00 until 2021-11-03T12:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42772>>  
  
• ETSI TC BRAN ad hoc meeting #112a  
 Dedicated to EN 301 893 and EN 303 687  
 Proposed agenda in BRAN(21)112a001  
 2022-01-10T10:00+01:00 until 2022-01-10T16:00+01:00  
 <<https://portal.etsi.org/Meetings.aspx#/meeting?MtgId=42773>>

* 1. **CEPT –** [**<ECC>**](https://cept.org/ecc/groups/ecc/client/introduction/) **(and more) next call, #57 02-05Nov21**
     1. Anything to share today? nothing
     2. 14oct: after the .18 call last , ECC will take up discussion of a WI on upper 6GHz for RLAN.
  2. **CEPT – ECC** [**<SE45>**](https://cept.org/ecc/groups/ecc/wg-se/se-45/client/introduction/) **call #15 – Jan2022 - not posted yet**
     1. Anything to share today? nothing
     2. **28oct:** Final report moved up to Jan, 2024. [https://www.cept.org/ecc/groups/ecc/wg-se/se-45/client/meeting-documents/?flid=29448](https://urldefense.com/v3/__https:/www.cept.org/ecc/groups/ecc/wg-se/se-45/client/meeting-documents/?flid=29448__;!!F7jv3iA!mB5ZQo9Bo-O1jA0inWo-_d60J1NcmgnJyTx4AUxwq_CZ4dHwBd3V_qaPd4dmr9DaaQ$)
        1. Heard two docs,
           1. the (21)008 JRC taken onboard – JRC Ispra Italy campus 40 sq km under JRC control. Hosts European Microwave Signature Laboratory (EMSL), a truncated 20m sphere,
           2. the (21)010 Scenarios ANFR doc gets heavy questioning.
        2. Next meeting January – CBTC rail side needs to get more technical about what exists today into 2024.
  3. **CEPT – ECC** [**<WGFM>**](https://cept.org/ecc/groups/ecc/wg-fm/client/introduction/)  **next meeting #101 07-11Feb22, Tentative, ECO (no virtual)**
     1. Anything to share today? nothing
  4. nice site: CEPT 6 GHz status across the countries: <https://docdb.cept.org/implementation/16737>

1. Chair presents slides 12, **Other regions (outside EU-Stds and USA), items to share**
   1. anything to share today? nothing
   2. **reminders**
      1. **Canada - RABC** –has a similar event with the new Spectrum Management Innovation Committee (for members)
         1. November 23 @ 13:00 - 14:30 EST; <https://www.rabc-cccr.ca/event/spectrum-management-innovation-committee/>
      2. **UK -** [**Department for Digital, Culture, Media & Sport**](https://www.gov.uk/government/organisations/department-for-digital-culture-media-sport); **Wireless Infrastructure Strategy: call for evidence**
         1. <https://www.gov.uk/government/consultations/wireless-infrastructure-strategy-call-for-evidence>
      3. I n July, [the DCMS Secretary of State commissioned Ofcom to undertake analysis to support the development of the strategy](https://www.gov.uk/government/publications/letters-between-dcms-and-ofcom-on-the-future-of-wireless-networks-infrastructure). This complements Ofcom’s strategic review of the mobile market.
         1. Submissions of evidence should be emailed to [wirelessinfrastructurestrategy@dcms.gov.uk](mailto:wirelessinfrastructurestrategy@dcms.gov.uk) by 25 November 2021.
      4. **UK- OFCOM** - We’re delighted to invite you to an upcoming Ofcom spectrum event: Enabling growth and innovation beyond 5G - the role of spectrum management.
         1. This will be held virtually from 3pm (BST-tbd) on 29 November.
      5. **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.
2. Chair presents slide 13, **ITU-R items to share**
   1. Anything to share? some
      1. The IEEE 802 liaison on light communications will be presented to WP 1A at their meeting starting now.
      2. The IEEE 802 liaisons on M.1450 and M.1801 will be presented to WP 5A at there meeting starting on 15nov21.
      3. CITEL – region 2 prepatory meeting on WRC-23 Agenda Items is next week (hosted by Mexico)
   2. **ongoing: 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>
   3. **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.
      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
   4. For miscellaneous links for ITU-R, SGs, WPs and calendars, see back up slides in agenda.
3. Chair presents slides 14 - 15, **General Discussion Items**
   1. **FCC NOI on Spectrum Requirements for the Internet of Things (12-353)**
      1. **The Proceeding OET 21-353:**
         1. <https://www.fcc.gov/ecfs/search/filings?proceedings_name=21-353&sort=date_disseminated,DESC>
         2. NoI in mentor: <https://mentor.ieee.org/802.18/dcn/21/18-21-0108-02-0000-fcc-noi-on-spectrum-for-the-internet-of-things.docx>
         3. **Reply Comment Date:** 
            1. **November 16, 2021, would have to start EC ballot 04Nov, this week.**
   2. Observation from one: this NOI is heavy on more licensed spectrum for carriers….
      1. From that would be important for IEEE 802 to voice our input on unlicensed spectrum is key to IoT operation.
   3. Had ad hocs this week and just ran out of time for final reply comments.
   4. However, we gained a lot of input on the IoT subject and will have a great base to build comments from if this proceeding goes to an NPRM later. Which we need to diligently watch for first signs when the NPRM is to come out and start earlier to put something together.
   5. Here is the link to the National Defence Authorization Act for Fiscal Year 2021 (pages 1410- 1414 in the PDF version, SEC. 9204. INTERNET OF THINGS) from which the NoI is spawned:
      1. <https://www.congress.gov/bill/116th-congress/house-bill/6395>
4. Wireless Telecommunication Bureau Seeks to Supplement the Record on 70/80/90 GHZ Bands
   1. FR Document: [2021-23712](https://www.federalregister.gov/documents/2021/11/02/2021-23712/wireless-telecommunication-bureau-seeks-to-supplement-the-record-on-708090-ghz-bands-notice-of?utm_source=federalregister.gov&utm_medium=email&utm_campaign=subscription+mailing+list); Citation: 86 FR 60436; [PDF](https://www.govinfo.gov/content/pkg/FR-2021-11-02/pdf/2021-23712.pdf?utm_source=federalregister.gov&utm_medium=email&utm_campaign=subscription+mailing+list) Pages 60436-60438 *(3 pages);* [Permalink](https://www.federalregister.gov/documents/2021/11/02/2021-23712/wireless-telecommunication-bureau-seeks-to-supplement-the-record-on-708090-ghz-bands-notice-of?utm_source=federalregister.gov&utm_medium=email&utm_campaign=subscription+mailing+list)
   2. Abstract: In this document, the Commission seeks comment to supplement the record in the rulemaking on a Notice of Proposed Rulemaking to address the potential for use of the 71-76 GHz, 81-86 GHz, 92-94 GHz, and the 94.1-95 GHz (70/80/90 GHz) bands to provide broadband internet access to consumers and communities that may otherwise lack robust, consistent connectivity. **In particular, the Commission seeks comment on whether High Altitude Platform Stations (HAPS) or other stratospheric- based platform...**
   3. Submit comments on or before December 2, 2021. Submit reply comments on or before January 3, 2022.
      1. Out of 802.18 18nov21- 2 weeks from now.
   4. Proceeding: <https://www.fcc.gov/ecfs/search/filings?proceedings_name=20-133&sort=date_disseminated,DESC>
   5. NPRM: <https://mentor.ieee.org/802.18/dcn/21/18-21-0137-00-0000-fcc-seeks-to-supplement-nprm-record-on-70-80-90-ghz-wtb-20-133.docx>
   6. Was sent to .11, .15 & .18. Any feedback today if we should comment? nothing heard
   7. IEEE 802 comments from last year:
      1. <https://mentor.ieee.org/802.18/dcn/20/18-20-0108-06-0000-comments-ieee802-fcc-nprm-20-133-70-80-90ghz-bands-expand-access.docx>
   8. The NPRM from last year:
      1. <https://mentor.ieee.org/802.18/dcn/20/18-20-0104-02-0000-fcc-proposed-rule-modernizing-and-expanding-access-to-the-70-80-90-ghz-bands.docx>
   9. A members input on NPRM from last year.
      1. <https://mentor.ieee.org/802.18/dcn/20/18-20-0105-01-0000-introduction-to-fcc-20-76-a1-modernizing-and-expanding-access-to-the-70-80-90-ghz-bands.pptx>
5. Chair presents slide 16, **General Discussion Items – ongoing fyi - MSGs 6 GHz**
   1. The WInnforum “6 GHz Committee”, all groups meet every 2 weeks except ***Incumbent Information, interference and Test & Certification***-weekly (168 people); some docs: <https://6ghz.wirelessinnovation.org/work-group-products>
      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. Org: 2 focus areas:
         1. ) AFC Functional Specification -WG – includes: Interference-TG, Incumbent Info-TG, security and Protocols 3GPP-TG
         2. 2) AFC Test and Certification-WG
      4. **Anything to share today? nothing today**
      5. **21oct:** TR-1014 (IR3) is in internal ballot, being shared with WFA AFC TG
         1. The process of coordination with the different organization has improve and time to approval is quicker.
         2. <https://www.wi-fi.org/file/afc-specification-and-test-plans> (open to all, just need contact info and privacy agreement)
   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 today? nothing today**
      7. **21oct:** MWG WS#3 received briefing on work underway in WFA AFC
         1. <https://syndicated.wifinowglobal.com/resource/wi-fi-alliance-accelerates-wi-fi-6e-development-with-automated-frequency-coordination/>
6. Chair presents slide 17, **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 call on 26oct21 was cancelled**
      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 23nov21.** (call-in in backup slides here)
7. Chair presents slide 18 **Actions Required**

ongoing:

* + Keep an eye out for FCC NPRM on IoT spectrum.
  + 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 19 Any Other Business
   1. none heard
2. Chair presents slide 20, Adjourn.
   1. **Next “weekly” teleconference (sched’d to 13jan22): 02dec –*15:00–<15:55* et**

**(no call on 25nov21)**

* + 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.
  1. 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)
  2. Adjourn:
     1. Any objection to Adjourn.
     2. None heard, Adjourn at 15:33et
  3. **The next IEEE 802 plenary will be electronic in November 2021, the next 2 weeks.**
  4. **The IEEE 802.18 (wireless) interim will be electronic in Jan 2022**
  5. Thank You

1. Attendance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Voting Attendees:** | |  |  | **4-Nov** |
| 1 | **Auluck** | Vijay | Self | **x** |
| 2 | **Holcomb** | Jay | Itron Inc. | **x** |
| 3 | **Kain** | Carl | USDOT, Noblis, Inc. | **x** |
| 4 | **Kenney** | John | TOYOTA InfoTechnology Center U.S.A. | **x** |
| 5 | **Kerry** | Stuart | OK‐Brit, Self | **x** |
| 6 | **Levy** | Joseph | InterDigital, Inc. | **x** |
| 7 | **Lynch** | Michael | MJ Lynch & Associates, LLC. | **x** |
| 8 | **Petrick** | Al | Skyworks Solutions Inc. | **x** |
| 9 | **Pirhonen** | Riku | NXP Semiconductors | **x** |
| 10 | **Rolfe** | Benjamin | Blind Creek Associates | **x** |
| 11 | **Stanley** | Dorothy | Hewlett Packard Enterprise | **x** |
| 12 | **Yaghoobi** | Hassan | Intel Corporation | **x** |
| 13 | **Yucek** | Tevfik | Qualcomm Incorporated | **x** |
|  |  |  |  |  |
| **Non-Voting Attendees:** | | |  |  |
| 1 | **Fang** | Yonggang | MediaTek | **x** |
| 2 | **Scott** | Andy | NCTA | **x** |