IEEE P802.11  
Wireless LANs

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| IEEE 802.11 TGax  July 2016 San Diego Meeting Minutes | | | | |
| Date: 2016-08-17 | | | | |
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Abstract

TGax meeting minutes from the IEEE 802.11 July 2016 San Diego meeting, July 24th – 29th, 2016.

Minutes/motions from the ad hoc groups are contained in the following documents:

* PHY Ad Hoc
  + <https://mentor.ieee.org/802.11/dcn/16/11-16-1040-00-00ax-tgax-july-2016-san-diego-phy-ad-hoc-meeting-minutes.docx>
* MAC Ad Hoc
  + [https://mentor.ieee.org/802.11/dcn/16/11-16-1000-02-00ax-july-2016-san-diego-tgax-mac-ad-hoc-meeting-minutes.docxMU Ad Hoc](https://mentor.ieee.org/802.11/dcn/16/11-16-1000-02-00ax-july-2016-san-diego-tgax-mac-ad-hoc-meeting-minutes.docxMU%20Ad%20Hoc)
* MU Ad Hoc
  + <https://mentor.ieee.org/802.11/dcn/16/11-16-1027-00-00ax-mu-ad-hoc-meeting-minutes-july-2016.docx>
* SR Ad Hoc
  + <https://mentor.ieee.org/802.11/dcn/16/11-16-1022-00-00ax-tgax-spatial-reuse-ad-hoc-group-meeting-minutes.docx>

**IEEE 802.11 Task Group ax**

**July 2016 San Diego Meeting**

**Manchester Grand Hyatt, San Diego, CA**

**July 24th – 29th, 2016**

**TGax Chair Osama Aboul-Magd (Huawei Technologies)**

**Vice Chair Simone Merlin (Qualcomm)**

**Vice Chair Ron Porat (Broadcom)**

**TGax Secretary Yasuhiko Inoue (NTT)**

**TGax Technical Editor Robert Stacy (Intel)**

**Monday, July 25th, 2016, AM1 TGax Ad Hoc Session (8:00-10:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @8:05
   1. This is TGax ad hoc session since this session is placed before the WG opening plenary.
2. **Announcement**
   1. Agenda Doc.11-16/0779r0 on the server. Rev. 1 is the working document.
   2. Meeting Protocol: Chair asked to state name and affiliation when speaking for the first time.
   3. Attendance reminder.
      1. The attendance server: https://imat.ieee.org/
3. **The chair reviewed the mandatory 5 slides of P&P.**
   1. Instructions for the WG Chair.
   2. Participants, Patents, and Duty to Inform.
   3. Patent Related Links.
   4. Call for potentially essential patents.
      1. **Chair asked if anyone is aware of potentially essential patents.**
      2. **No potentially essential patents reported.**
   5. Other Guidelines for IEEE WG Meetings.
4. **Agenda items for the week**
   1. Approve TG and Telecons minutes since May meeting.
   2. Resolution of comments received on draft D0.1
   3. Ad Hoc group meetings
   4. Technical Presentations and related straw polls and/or motions
   5. Schedule Telecon times.
5. **General Flow of the meeting**
   1. Slides 13 and 14 of the 16/0779r1 contain general flow of the meeting.
   2. There are eight meeting slots planed for TGax.

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|  | Monday | Tuesday | | Wednesday | | Thursday |
| AM1 | TGax  (full, ad hoc) |  | | TGax  (full) | |  |
| AM2 |  | TGax  (Ad Hoc) | TGax  (Ad Hoc) |  | | TGax  (full) |
| PM1 |  |  |  | TGax  (Ad Hoc) | TGax  (Ad Hoc) | TGax  (full) |
| PM2 | TGax  (full) | TGax  (Ad Hoc) | TGax  (Ad Hoc) | TGax  (full) | |  |
| PM3 |  | TGax  (Ad Hoc) | TGax  (Ad Hoc) |  | |  |

1. **Agenda for Monday, July 25th, AM1 (8:00 – 10:00 AM).**
   1. Proposed Agenda for Monday AM1:
      1. Call meeting to order
      2. Patent policy, etc.
      3. This is TGax full ad hoc meeting (No motions)
      4. Call for submissions.
      5. Set up agenda for the ad hoc meeting.
      6. Presentations
      7. Adjourn
   2. Chair asked if there are any other items – No items proposed. Meeting will be conducted based on this order.
2. **Call for submissions – we have 90 submissions**
   1. PHY – 26 submissions
      1. 11-16-0816, “Comment Resolution for CID 2183,” Daewon Lee (Newracom)
      2. 11-16-0872, “CR HE-SIG-A Part II,” Ross Jian Yu (Huawei Technologies)
      3. 11-16-0873, “CR HE-SIG-A Part I,” Ross Jian Yu (Huawei Technologies)
      4. 11-16-0891, “LDPC for 1024QAM,” Hongyuan Zhang (Marvell)
      5. 11-16-0892, “Spec Text on LDPC for 1024QAM,” Hongyuan Zhang (Marvell)
      6. 11-16-0893, “11ax Extended Range PPDU,“ Bin Tian (Qualcomm)
      7. 11-16-0894, “HE-LTF Capabilities,” Hongyuan Zhang (Marvell)
      8. 11-16-0895, “Spec Text for HE-LTF Capabilities,” Hongyuan Zhang (Marvell)
      9. 11-16-0896, “11ax Beamformee Capabilities,” Hongyuan Zhang (Marvell)
      10. 11-16-0897, “Spec Text for Beamformee Capabilities,” Hongyuan Zhang (Marvell)
      11. 11-16-0898, “BW Field in HE-MU Format,” Hongyuan Zhang (Marvell)
      12. 11-16-0899, “Spec Text for BW Field in HE-MU Format,” Hongyuan Zhang (Marvell)
      13. 11-16-0900, “PHY Comment Resolution for CID 1052 and 2519,” Bin Tian (Qualcomm)
      14. 11-16-0903, “Gamma phase rotation for HE PPDU,” Yujin Noh (Newracom)
      15. 11-16-0904, “Proposed text for gamma phase rotation for HE PPDU,” Yujin Noh (Newracom)
      16. 11-16-0906, “RU restriction on 20MHz operating STAs,” Joonsuk Kim (Apple)
      17. 11-16-0908, “CR - proposed text on RU restriction of 20MHz STAs,” Joonsuk Kim (Apple)
      18. 11-16-0910, “Minimum Occupied Bandwidth,” Ron Porat (Broadcom)
      19. 11-16-0914, “Bit field finalization of HE-SIG-A,” Lochan Verma (Qualcomm)
      20. 11-16-0915, “Text for bit field finalization of HE-SIG-A,” Lochan Verma (Qualcomm)
      21. 11-16-0920, “PHY comment resolution for CID 1659,493,494,” Xiaogang Chen (Intel)
      22. 11-16-0922, “PHY CR 1024 QAM,” Sriram Venkateswaran (Broadcom)
      23. 11-16-0923, “PHY CR DCM Constellation Mapping,” Sriram Venkateswaran (Broadcom)
      24. 11-16-0928, “CR on Section 26.3.9.8 - HE-SIG-B,” Kaushik Josiam
      25. 11-16-0937, “11ax Comment Resolutions for Clauses 26.3.2-26.3.9.3-26.3.9.4-26.3.9.5-26.3.10.2- 26.3.10.13,” Rui Cao (Marvell)
      26. 11-16-0964, “Considerations on MAC-PHY interactions during SR operations,” Jing Ma (NICT)
   2. MAC – 34 submissions
      1. 11-16-0828, “HE Fragmentation - part 1,” Alfred Asterjadhi (Qualcomm)
      2. 11-16-0829, “Comment Resolution for Section 10.24.10 Block Ack/GCR block ack,” Reza Hedayat (Newracom)
      3. 11-16-0844, “CC0-Intra\_PPDU\_PS,” Alfred Asterjadhi (Qualcomm)
      4. 11-16-0856, “Issue of Buffer Status reporting,” Stephane Baron (Canon)
      5. 11-16-0860, “comment resolution on A-MPDU format, » Yongho Seok (Newracom)
      6. 11-16-0861, “comment resolution on mu acknowledgment procedure,” Yongho Seok (Newracom)
      7. 11-16-0862, “comment resolution on subclause 25.11,” Yongho Seok (Newracom)
      8. 11-16-0864, “d0.1 comment resolution on clause 6,” Yasuhiko Inoue (NTT)
      9. 11-16-0867, “CIDs for CIDs: Section 9.3.1.9.3 Compressed BA format,” George Cherian (Qualcomm)
      10. 11-16-0868, “CIDs for Section 9.3.1.9.7 Multi STA BAs, ” George Cherian (Qualcomm)
      11. 11-16-0869, “Comment resolution section 9.3 TWT,” Zhou Lan (Broadcom)
      12. 11-16-0871, “Trigger Frame Per User Info Order,” Zhou Lan (Broadcom)
      13. 11-16-0877, “Comment resolution on CID 783 (TXOP Duration field format),” Jeongki Kim (LG Electronics)
      14. 11-16-0878, “Comment resolution on CID 782 (Intra-PPDU PS),” Jeongki Kim (LG Electronics)
      15. 11-16-0881, “Comment resolution on ROMI,” Jayh Park (LG Electronics)
      16. 11-16-0882, “Comment resolution on TOMI,” Jayh Park (LG Electronics)
      17. 11-16-0883, “Comment resolution for CID 152,” Jayh Park (LG Electronics)
      18. 11-16-0884, “Spec. Text for HE Operation element and AID Assign Rule,” Jianhan Liu (MediaTek)
      19. 11-16-0890, “Comment Resolution on NAV Setting of Single and Multiple Protection and Control Response,” Po-Kai Huang (Intel)
      20. 11-16-0913, “SU Multi-TID Rules,” Jarkko Kneckt (Apple)
      21. 11-16-0916, “TID value of ALL ACK signaling,” Woojin Ahn (Wilus Institute)
      22. 11-16-0917, “Text for TID value of ALL ACK signaling,” Woojin Ahn (Wilus Institute)
      23. 11-16-0918, “Discussions on Partial BSS Color,” Geonjung Ko (Wilus Institute)
      24. 11-16-0924, “NAV resetting with RTS/MU-RTS,” Weimin Xing (ZTE)
      25. 11-16-0925, "Spex text on NAV resetting with RTS/MU-RTS,” Weimin Xing (ZTE)
      26. 11-16-0941, “CR HE Fragmentation - part 2,” Ming Gan (Huawei technologies)
      27. 11-16-0942, “CR Service Field,” Ming Gan (Huawei Technologies)
      28. 11-16-0951, “Setting for TXOP Duration Field,” Po-Kai Huang (Intel)
      29. 11-16-0952, “Spec text trigger frame per user info order,” Zhou Lan (Broadcom)
      30. 11-16-0953, “Comment Resolution and Spec Text for Setting for TXOP Duration field,” Po-Kai Huang (Intel)
      31. 11-16-0960, “AP access procedure for UL MU operation,” Jinsoo Ahn (Yonsei Univ.)
      32. 11-16-0961, “Consideration on Multi-STA BlockAck Optimization,” Hanseul Hong (Yonsei Univ.)
      33. 11-16-0962, “EDCA rules follow up 1,” Jing Ma (NICT)
      34. 11-16-0963, “EDCA rules follow up 2,” Jing Ma (NICT)
      35. 11-16-0966, “CID 71 and CID 190 Resolutions,” Jarkko Kneckt (Apple)
      36. 11-16-0998, “2 sets of EDCA parameters,” Laurent Cariou (Intel)
   3. MU – 12 submissions
      1. 11-16-0866, “Comment Resolution of Section 26.3.13 MU-MIMO,” Kome Oteri (InterDigital)
      2. 11-16-0875, “CR for the section 10.3.2.8a CS Condition to Respond CTS,” Kiseon Ryu (LG Electronics)
      3. 11-16-0876, “CR for the section 25.5.2.4 UL MU CS CCA and CS Required Bit,” Kiseon Ryu (LG Electronics)
      4. 11-16-0880, “UL MU Transmission Rules - EDCA backoff,” Jayh Park (LG Electronics)
      5. 11-16-0885, “Comment Resolution on UL MU CS NAV Consideration,” Po-Kai Huang (Intel)
      6. 11-16-0886, “Comment Resolution for some UL MU CS TBD,” Po-Kai Huang (Intel)
      7. 11-16-0887, “Spec Text for MU-RTS restriction on HE MU PPDU,” Po-Kai Huang (Intel)
      8. 11-16-0926, “Soliciting UL\_MU\_ACK,” Raja Banerjea (Qualcomm)
      9. 11-16-0929, “CR - UL MU Operation,” Simone Merlin (Qualcomm)
      10. 11-16-0930, “CR - DL MU Operation,” Simone Merlin (Qualcomm)
      11. 11-16-0938, “Comment Resolution for Sub-clause 25.10.4,” Chittabrata Ghosh (Intel)
      12. 11-16-0958, “UL OFDMA for Unassociated STAs,” Leonardo Lanante (Kyushu Institute of Tech.)
   4. SR – 10 submissions
      1. 11-16-0879, “Comment resolution on SR for VHT PPDUs,” Jeongki Kim (LG Electronics)
      2. 11-16-0889, “Comment Resolution for Spatial Reuse (Intra BSS detection),” Young Hoon Kwon (Newracom)
      3. 11-16-0901, “Clarification of SR Fields in HE Trigger Based PPDU,” Daewon Lee (Newracom)
      4. 11-16-0902, “Proposed Text Changes for SR Fields in HE Trigger-Based PPDU,” Daewon Lee (Newracom)
      5. 11-16-0905, “SR Fields Clarification,” Ron Porat (Broadcom)
      6. 11-16-0919, “Discussions on SR Fields in HE Trigger-based PPDU,” Geonjung Ko (Wilus Institute)
      7. 11-16-0310, “DSC Proposal Text,” Graham Smith (SR Technologies)
      8. 11-16-0945, “Clarifications for OBSS\_PD-based SR parameters,” Laurent Cariou (Intel)
      9. 11-16-0946, “Proposed text changes for OBSS\_PD-based SR parameters,” Laurent Cariou (Intel)
      10. 11-16-0957, “Comment Resolutions on OBSS\_PD Conditions in 25.9.3,” James Wang (MediaTek)
   5. TG – 8 submissions
      1. 11-16-0835, “EIFS,” Alfred Asterjadhi (Qualcomm)
      2. 11-15-1095, “OFDMA Performance in 11ax,” Suhwook Kim (LG Electronics)
      3. 11-16-0870, “Conclusing MAC Trigger Padding,” Zhou Lan (Broadcom)
      4. 11-16-0907, “20MHz HE devices,” Joonsuk Kim (Apple)
      5. 11-16-0909, “CR – proposed text on 20 MHz devices,” Joonsuk Kim (Apple)
      6. 11-16-0949, “MAC trigger frame padding follow up,” Zhou Lan (Broadcom)
      7. 11-16-0965, “On High Efficiency WLAN (HEW) TG PAR Scope,” Osama Aboul-Magd (Huawei Technologies)
3. **Ad Hoc meeting scheduling**
   1. Ad Hoc slot assignment
      1. MAC … as many as possible, PHY … as many as possible, SR … 1, MU … 1.
   2. Chair asked if there are any objections to approve the TGax schedule as follow.
      1. There are no objections. The TGax schedule is approved.

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|  | Monday | Tuesday | | Wednesday | | Thursday |
| AM1 | TGax  (full, ad hoc) |  | | TGax  (full) | |  |
| AM2 |  | TGax  (MAC) | TGax  (PHY) |  | | TGax  (full) |
| PM1 |  |  |  | TGax  (PHY) | TGax  (MAC) | TGax  (full) |
| PM2 | TGax  (full) | TGax  (SR) | TGax  (MU) | TGax  (full) | |  |
| PM3 |  | TGax  (MAC) | TGax  (PHY) |  | |  |

1. **Presentations**
   1. **Bo Sun (ZTE) presented “Proposed Resolutions to comments on 26.2.2” based on the submission 11-16-0813-03 (on behalf of Ke Yao).**
      1. Summary
         1. Resolutions for the CIDs 1780, 370, 1923, 2517 and 1610 are proposed.
         2. TBDs are removed.
         3. Three parameters for the TXVECTOR and RXVECTOR are added.
      2. Discussion
         1. A member asked for offline discussion on additional parameters.
         2. There are two other related submissions.
      3. Next step
         1. Bo Sun to work with the authors of related submissions.
   2. **Alfred Asterjadhi (Qualcomm) presented “EIFS,” based on the submission 11-16-0835-00.**
      1. Summary
         1. The title of the document is EIFS, however it is mostly related to
      2. Discussion
         1. No discussion.
   3. **Jeongki Kim (LG Electronics) presented “Comment Resolution on CID 783 (TXOP Duration Field),” based on the submission 11-16-0877-00.**
      1. Summary
         1. Text for TXOP Duration field was proposed.
      2. Discussion
         1. No discussion.
         2. Jeongki to work with Alfred.
   4. **Po-Kai Huang (Intel) presented “Setting for TXOP Duration Field,” based on the submission 11-16-0951-00.**
      1. Summary
         1. Size of TXOP Duration field in HE-SIG-A has been decided.
         2. The setting rule of TXOP Duration field remains TBD and is discussed in this contribution.
         3. Spec text contained in 16/953r0 which related to CID 2596 was also presented.
      2. Discussion
         1. A member has a suggestion on the proposed text.
         2. A member commented that there will be more than one STA responding to a Trigger and all of them should have the same TXOP duration.
         3. Another member asked for evaluation results such as channel access or throughput since preamble and MAC header have different length for TXOP.
         4. A member pointed out that all 1s could be all 0s.
   5. **Bo Sun (ZTE) presented “Proposed Resolutions to comments on 26.2.2” based on the submission 11-16-0813-04.**
      1. Update: TXOP Duration is covered by Jeongki’s submission 16/877r1.
2. **AoB**
   1. Chair asked if we have any business that can be conducted
3. **Adjournment**
   1. **TGax ad hoc session adjourned @ 10:00 AM.**

**Monday, July 25th, 2016, PM2 TGax Full Session (16:00-18:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @16:00
   1. About 120 people are in the room.
2. **Announcement**
   1. Agenda Doc.11-16/0779r1 on the server. Rev. 2 is the working document.
   2. Meeting Protocol: Chair asked to state name and affiliation when speaking for the first time.
   3. Attendance reminder.
      1. The attendance server: https://imat.ieee.org/
3. **The chair reviewed the mandatory 5 slides of P&P.**
   1. Instructions for the WG Chair.
   2. Participants, Patents, and Duty to Inform.
   3. Patent Related Links.
   4. Call for potentially essential patents.
      1. **Chair asked if anyone is aware of potentially essential patents.**
      2. **No potentially essential patents reported.**
   5. Other Guidelines for IEEE WG Meetings.
4. **Agenda Setting**
   1. Proposed Agenda for this time slot:
      1. Call meeting to order
      2. Patent policy, etc.
      3. Call for submissions
      4. Set Ad Hoc Groups schedule and approve agenda
      5. Comment Resolution Tutorial – Adrian Stephens
      6. Summary from May 2016 meeting
      7. TG motions
         1. Approve TG meeting and Telecon minutes since May meeting.
         2. Approve resolutions of comments, if needed.
      8. Comment Resolution Status – Robert Stacey
      9. Timeline
      10. Presentations and Comment Resolution
          1. TXOP Duration Issues (Jeongki Kim and Bo Sun)
          2. 11-16/0965; On HEW TG PAR Scope
          3. 11-15/1095; OFDMA Performance in 11ax
          4. …
      11. Recess
   2. Chair asked if there is any addition, modification to the agenda?
      1. One additional submission reported.
      2. TGax Schedule
      3. Nothing reported. The agenda was approved.
5. **Comment Resolution Tutorial by Adrian Stephens.**
   1. Adrian Stephens, WG Chair, presented “**802.11 Comment Resolution – a Tutorial**,” based on the document 11-13-0230r3.
      1. Summary
      2. Discussion
         1. Numbering of Motions – CR resolution motions should be numbered.
         2. Comment Resolution:
            1. Structure: Comment/Discussion/Proposed Text/Some Analysis
            2. For the sake of people to understand the process to come to conclusion, it is recommended.
6. **Call for presentations**
   1. Done during the AM1 today.
7. **Set Ad Hoc Groups schedule and approve agenda**
   1. Done during AM1.
   2. TGax Schedule for the week:

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|  | Monday | Tuesday | | Wednesday | | Thursday |
| AM1 | TGax  (full ad hoc) |  | | TGax  (full) | |  |
| AM2 |  | TGax  (PHY) | TGax  (MAC) |  | | TGax  (full) |
| PM1 |  |  |  | TGax  (PHY) | TGax  (MAC) | TGax  (full) |
| PM2 | TGax | TGax  (SR) | TGax  (MU) | TGax  (full) | |  |
| PM3 |  | TGax  (PHY) | TGax  (MAC) |  | |  |

1. **Summary from May 2016 Meeting**
   1. Received about 70 submissions. Majority of the submission were requesting changes to the TG Specification Framework document. Few submissions were addressing comment resolution mainly for the PHY clause.
   2. Agreed to terminate the Specification Framework process. The frame of reference is Draft D0.1.
      1. Future submissions shall bring text to continue developing the TG draft
   3. Approved the resolutions of about 200 comments, most of them addressing the PHY clause
   4. Revisited the timeline and accepted a new modified timeline – next slide.
   5. The TG had a series of telecons where resolutions of about 227 comments were discussed.
   6. Submissions Covered During Teleconferences
      1. <https://mentor.ieee.org/802.11/dcn/16/11-16-0725-03-00ax-comment-resolution-on-9-3-1-23.docx> (6 CIDs)
      2. <https://mentor.ieee.org/802.11/dcn/16/11-16-0773-02-00ax-comment-resolution-section-25-6-he-sounding.docx> (15 CIDs)
      3. <https://mentor.ieee.org/802.11/dcn/16/11-16-0774-01-00ax-comment-resolution-on-9-3-1-23-ruallocation.docx> (14 CIDs)
      4. <https://mentor.ieee.org/802.11/dcn/16/11-16-0780-01-00ax-comment-resolution-on-9-3-1-23-phy-tbd.docx> (31 CIDs)
      5. [https://mentor.ieee.org/802.11/dcn/16/11-16-0775-01-00ax-comment-resolution-on-section-26-3-12-4-phy-mu-mimo-power-pre-correction.docx (7](https://mentor.ieee.org/802.11/dcn/16/11-16-0775-01-00ax-comment-resolution-on-section-26-3-12-4-phy-mu-mimo-power-pre-correction.docx%20(7) CIDs)
      6. <https://mentor.ieee.org/802.11/dcn/16/11-16-0766-00-00ax-he-variant-ht-control-ul-mu-response.docx> (28 CIDs)
      7. <https://mentor.ieee.org/802.11/dcn/16/11-16-0798-00-00ax-he-variant-ht-control-general.docx> (33 CIDs)
      8. <https://mentor.ieee.org/802.11/dcn/16/11-16-0815-02-00ax-comment-resolution-mu-rts-scrambler-seed.docx> (5 CIDs)
      9. <https://mentor.ieee.org/802.11/dcn/16/11-16-0819-01-00ax-cids-for-section-9-3-1-9-blockack-frame-format.docx> (9 CIDs)
      10. <https://mentor.ieee.org/802.11/dcn/16/11-16-0806-00-00ax-he-variant-ht-control-buffer-status-report.docx> (24 CIDs)
      11. <https://mentor.ieee.org/802.11/dcn/16/11-16-0807-00-00ax-comment-resolution-on-mu-rts-cts-procedure.docx> (27 CIDs)
          1. Note: A new revision is expected to accommodate Mark’s comments
      12. <https://mentor.ieee.org/802.11/dcn/16/11-16-0808-00-00ax-comment-resolution-on-trigger-frame-format-mu-rts-variant.docx> (14 CIDs)
          1. Note: A new revision is expected to accommodate Mark’s comments
      13. <https://mentor.ieee.org/802.11/dcn/16/11-16-0813-00-00ax-cr-on-secition-26-2-2-txrxvector-parameters.doc> (4 CIDs)
          1. Note: We need to revisit this document again to try to cose a couple of TBDs
      14. <https://mentor.ieee.org/802.11/dcn/16/11-16-0836-00-00ax-comment-resolution-on-section-9-4-1-phy-mu-mimo-compressed-beamforming-report.docx> (10 CIDs)
          1. Note: Adds significant amount of text and introduces new frame.
   7. Chair asked if there is any comment – No comment.
2. **TG Motions**
   1. **Motion: Approve TGax minutes of meetings and teleconferences from May 2016 interim meeting to today:** 
      * [**https://mentor.ieee.org/802.11/dcn/16/11-16-0686-00-00ax-tgax-may-2016-waikoloa-meeting-minutes.docx**](https://mentor.ieee.org/802.11/dcn/16/11-16-0686-00-00ax-tgax-may-2016-waikoloa-meeting-minutes.docx)
      * [**https://mentor.ieee.org/802.11/dcn/16/11-16-0768-05-00ax-tgax-teleconference-minutes-from-june-to-july-2016.docx**](https://mentor.ieee.org/802.11/dcn/16/11-16-0768-05-00ax-tgax-teleconference-minutes-from-june-to-july-2016.docx)
      * [**https://mentor.ieee.org/802.11/dcn/16/11-16-0755-00-00ax-tgax-may-2016-waikoloa-phy-ad-hoc-meeting-minutes.docx**](https://mentor.ieee.org/802.11/dcn/16/11-16-0755-00-00ax-tgax-may-2016-waikoloa-phy-ad-hoc-meeting-minutes.docx)
      * [**https://mentor.ieee.org/802.11/dcn/16/11-16-0716-00-00ax-mu-ad-hoc-meeting-minutes-may-2016.docx**](https://mentor.ieee.org/802.11/dcn/16/11-16-0716-00-00ax-mu-ad-hoc-meeting-minutes-may-2016.docx)
      1. [**https://mentor.ieee.org/802.11/dcn/16/11-16-0701-00-00ax-combined-spatial-reuse-mac-ad-hoc-group-meeting-minutes.docx**](https://mentor.ieee.org/802.11/dcn/16/11-16-0701-00-00ax-combined-spatial-reuse-mac-ad-hoc-group-meeting-minutes.docx)
      2. **Moved: Bo Sun, Second: Robert Stacy**
      3. Discussion: No discussion.
      4. **Result: The motion was accepted with no objection.**
3. **Comment Resolution Status (Editor Report)**
   1. Robert Stacy presented “TGax Editor’s Report,” based on the submission 11-16-995r0
   2. Discussion
      1. C: There was a request to change MU database maintainer.
      2. Q: What about the comments discussed during the teleconference?
      3. A: Those resolutions are not motioned. They will be incorporated after motions.
      4. Chair is wondering if September is the realistic time to produce draft 1.0.
4. **From IEEE 802.11 Operation Manual**
   1. [**https://mentor.ieee.org/802.11/dcn/14/11-14-0629-14-0000-802-11-operations-manual.docx**](https://mentor.ieee.org/802.11/dcn/14/11-14-0629-14-0000-802-11-operations-manual.docx)
   2. Motions modifying drafts may be made at appropriate times during meetings.

Complex technical changes to a draft shall be in a submission that has been accepted by document control according to document formats specified in section 3.7 of this document and has been made available electronically for a period of not less than four active 802.11 WG session hours. The TG chair determines if a technical change is sufficiently complex to require a submission.

* 1. When a CRC is following the “Accelerated process” for completion of a WG letter ballot, and is not meeting during an 802.11 WG session, any submission containing changes to the draft shall be on the server and announced to the appropriate TG reflector no less than 72 hours before any motion is made related to that submission.

NOTE – when a CRC is meeting coincident with an 802.11 session, it is subject to the four hour rule described in the previous paragraph.

* 1. Comment:
     1. This rule is applied once the draft gets 75% approval – it is not applied to TGax right now.
     2. It is good to follow this practice even though the rule is not applied to us.

1. **Timeline**
   1. Slide 27 of the agenda document
      * **May 2014: start of the TG**
      * **Nov. 2014: First draft of the TG SFD was approved**
      * **Jan. 2016: proposed TG draft**
      * **March 2016: Draft D0.1 was approved and CC started**
      * **September 2016: Draft 1.0 and WG letter ballot**
      * **March 2017: Draft 2.0 and recirculation**
      * **July 2017: MDR (Mandatory Document Review)**
      * **November 2017: Formation of SB pool**
      * **March 2018: Sponsor Ballot**
      * **December 2018: RevCom**
2. **Presentations**
   1. **Jeongki Kim (LG Electronics) presented “,” based on the submission 11-16-0877-04.**
      1. Summary
         1. The presenter had offline discussion with some members after AM1 and the document was revised.
            1. Text for TXOP\_DURATION was updated.
      2. Discussion
         1. A member asked for the revision number of the document. 🡪 Rev. 4.
         2. Chair suggested to upload r5 modifying that part.
   2. **Bo Sun (ZTE) presented “” based on the submission 11-16-0813-04.**
      1. Summary
         1. The document was updated based on the Jeongki’s document 11-16-0877-04.
      2. Discussion
         1. Chair asked if there is any objection for the proposed resolution. There is no objection.
   3. **Osama Aboul-Magd (Huawei Technologies) presented “PAR” based on the submission 11-16-0965-00.**
      1. Summary
         1. This submission attempts to start the discussion on how to verify the TG PAR scope.
         2. No straightforward way to see 4 times improvement.
         3. Options:
            1. Do nothing 🡪 likely to cause problem.
            2. To change the PAR 🡪 will be the last choice.
            3. Run simulations based on the scenarios we agreed and show that we have a mode of operation to achieve our goal.
      2. Discussion
         1. If we do not have simulation, we can show some analysis result.
         2. There are some submissions showing the simulation results.
         3. Should we form a team to do this work?
            1. A member mentioned that his team can do this work.
            2. Another member mentioned document 15/333 contains some analysis.
         4. Q: Will the simulation scenario document be updated? – Yes, if it is needed.
   4. **Suhwook Kim (LG Electronics) presented “OFDMA Performance in 11ax,” based on the submission 11-15-1095-09.**
      1. Summary
         1. TCP traffic is considered in this version.
         2. TCP timeout has a significant impact on the system performance.
      2. Discussion
         1. Q: Is the OFDMA based on the 802.11ax spec? 🡪 Yes.
            1. Then, we do not have four times improvement.
         2. C: Bluray needs 50 M bit/s throughput. 🡪 Chair suggested offline discussions.
3. **AoB**
   1. Ad Hoc schedule for tomorrow
      1. AM2
         1. PHY
         2. MAC
      2. PM2
         1. MU.
         2. SR.
      3. PM3
         1. PHY
         2. MAC
4. **TGax meeting recessed @ 18:01.**

**Tuesday, July 26th, 2016, AM2 TGax Ad Hoc Sessions (10:30-12:30)**

* PHY Ad hoc – Seaport D & E.
  + Agenda: 11-16-1007
* MAC Ad hoc – Seaport G.
  + Agenda: 11-16-997

**Tuesday, July 26th, 2016, PM2 TGax Ad Hoc Sessions (16:00-18:00)**

* MU Ad hoc – Seaport D & E.
  + Agenda: 11-16-1012
* SR Ad hoc – Seaport G.
  + Agenda: 11-16-1016

**Tuesday, July 26th 2016, PM3 TGax Ad Hoc Session (19:30-21:30)**

* PHY Ad hoc – Seaport D & E.
  + Agenda: 11-16-1007
* MAC Ad hoc – Seaport G
  + Agenda: 11-16-997

**Wednesday, July 27th 2016, AM1 TGax Full Sessions (8:00-10:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @8:02
   1. About 120 people are in the room.
2. Announcements/Reminder
   1. Chair asked participants to state name and affiliation when speaking for the first time during the session.
   2. Chair reminded that the meeting is conducted under IEEE 802 and 802.11 P&P.
   3. Chair reminded attendance.
3. Agenda Setting
   1. Proposed agenda for this session
      1. Call Meeting to order
      2. IEEE 802 and 802.11 IPR Policy and procedure.
      3. Progress from Ad Hocs
      4. Presentations
         1. 11-16/0907: 20 MHz HE Devices – Joonsuk kim
         2. 11-16/0909: Text for 20 MHz - Joonsuk Kim
         3. 11-16/0870 and 11-16/0949 – Zhou Lan
         4. 11-16/0971 – Graham Smith
         5. 11-16/0957 – James Wang
         6. 11-16/0947 – Laurent Cariou
      5. Recess
   2. Chair asked if there is any objection to proceed with this agenda. 🡪 No objection.
   3. The agenda for Wednesday AM1 was approved.
4. Progress from Ad Hoc groups
   1. PHY: 8 submissions remaining.
   2. MAC: heard half dozen presentations.
   3. MU: 6 submissions left – all of them are comment resolutions.
   4. SR: 6 presentations heard.
5. Presentations
   1. **Joonsuk Kim (Apple) presented “20 MHz-only Device in 11ax,” based on the submission 11-16-0907r2.**
      1. Summary
         1. The 20 MHz only device is for low power, low complexity and better connectivity for wearable devices, home network connectivity, etc.
      2. Discussion
         1. Slide 12, Mandatory/Optional table: A member commented that we have not discussed M/O in TGax. 🡪 This table is just an example.
      3. Straw Polls
         1. Straw Poll #1: Do you support following Mandatory and Optional features on bandwidth?

* In 2.4GHz,
* 20MHz is mandatory for AP and non-AP
* 40MHz is optional for AP and non-AP [signaled in capability field]
* In 5GHz,
* 20/40/80MHz is mandatory for AP
* Non-AP can be either 20MHz-only, 80MHz, 160MHz or 80+80MHz capable [signaled in capability field]
* 11ax spec document shall not allow STAs that are 40MHz capable but not 80MHz capable
  + - * 1. Result: Y/N/A = 80/0/14
      1. Straw Poll #2: Do you support 20MHz-only non-AP STAs operate in primary 20MHz channel as a mandatory mode?
         1. Result: Y/N/A = 76/0/8.
      2. Straw Poll #3: Do you support 20MHz-only non-AP STAs support tone mapping of tone-26 RU, tone-52 RU, tone-106 RU and tone-242 RU for
* 20, 40\* MHz OFDMA in 2.4GHz and 5GHz band
* 80\*, 80+80\*, 160\* MHz OFDMA in 5GHz band
* [Note\*] Some of RUs are restricted for operation [1]
  + - * 1. Result: 72/0/11.
    1. **Joonsuk presented “Spec text for 20 MHz-only devices in 11ax,” based on 11-16-0909-01.**
       1. Discussion
          1. A member suggested that text should refer to the all of relevant channel width such as 80 MHz, 160 MHz and 80+80 MHz.
          2. Another member commented for clarification purpose that a 20 MHz only device does not support VHT operation.
       2. Next step:
          1. Joonsuk to upload updated version (r2) of this document incorporating the comments and suggestions. A motion to adopt 16/909r2 will be conducted during PM2 session.
  1. **Zhou Lan (Broadcom) presented “MAC trigger frame padding follow up,” based on the submission 11-16-0949-01.**
     1. Summary
        1. TBDs related to MAC trigger frame padding are resolved.
        2. Related CIDs: 2890, 2896 and 1643.
        3. Spec text (11-16-0870-00) also proposed.
     2. Discussion
        1. A member asked for the purpose of MAC padding. 🡪 For a Trigger frame, the receiver needs some time to process and prepare for the next action.
     3. Straw Polls
        1. Straw Poll #1: Do you support to direct TGax editor to adopt doc 11-16-0870r0 into TGax Draft per editing instruction in doc.11-16-0870r0 to conclude MAC trigger padding TBDs?
           1. Result: No objection.
        2. Straw Poll #2: Do you support to adopt the resolution text for comment CID 2890, 2896, 1634 as provided in 11-16-0870r0?
           1. Result: No objection.
  2. **Graham Smith (SR Technologies) presented “Resolution on CID 69 and others,” based on the submission 11-16-0971-02.**
     1. Summary
        1. 16/971r2 contains the proposed text for 11ax Draft with respect to dynamic sensitivity control (DSC) so as to satisfy CID 69.
        2. Other CIDs #9, 187, 188, 208, 209, 225, 257, 463, 464, 651, 703, 704, 953, 994, 1016, 2332, 2336, 2912, 2724, and 2742 are also resolved.
     2. Discussion
        1. A member commented on the relationship between the information in preamble and DSC.
        2. Another member expressed concern that we already have two operations to change the sensitivity and detect the OBSS packet, therefore additional mode could increase the complexity. 🡪 The presenter responded that this proposal is much simpler.
        3. There is an opinion that spatial reuse technique should only be applied to the OBSS cases, and this proposal is not aligned to that direction.
        4. Some members are supportive for this proposal.
        5. There was a comment that determination of threshold should clarified.
     3. Straw Polls – Chair suggested to defer the straw poll.
  3. **James Wang (MediaTek) presented “Comment Resolution on OBSS\_PD Conditions in 25.9.3,” based on the submission 11-16-0957-01.**
     1. Summary
        1. The resolution for CID #706 on Clause 25.9.3 is provided.
        2. Spec text for this sub-clause is proposed.
     2. Discussion
        1. A member mentioned that there still are three TBDs in the text. 🡪 Those TBDs are resolved by CR for different CIDs.
        2. A member has some comments on the text of P50, L1 and would like to work offline with James. The commenter also mentioned that the equation has to be updated.
        3. Another member commented that we have not seen that this algorithm actually works and he is not convinced.

1. AOB
   1. As a general policy, given a motion on an explicitly listed CID X that is resolved in an explicitly specified doc (say with revision R), if the proposed comment resolution within the doc for CID X refers to a revision earlier than R (e.g. R-1, due to an oversight by the comment resolver), the chair indicated he was OK if the database editors modified the comment resolution to refer to revision “R” in accordance with the intent of the motion.
   2. No concerns were raised by the members.
2. Recess
   1. TGax full session is in recess until PM2 today.

**Wednesday, July 27th 2016, PM1 TGax Ad Hoc Sessions (13:30-15:30)**

* PHY ad hoc 🡪 Seaport D & E.
  + Agenda: 11-16-1007
* MAC ad hoc 🡪 Seaport G
  + Agenda: 11-16-0997

**Wednesday, July 27th 2016, PM2 TGax Full Sessions (16:00-18:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @16:00
2. Announcements
   1. Chair asked participants to state name and affiliation when speaking for the first time during the session.
   2. Chair reminded that the meeting is conducted under IEEE 802 and 802.11 P&P.
   3. Chair reminded attendance.
3. Agenda Setting
   1. Proposed Agenda for this session:
      1. Meeting call to order
      2. Announcement
      3. Agenda setting
      4. Presentations
         1. 11-16/947: Laurent Cariou
         2. 11-16/957: James Wang (??)
      5. TG Motions
      6. Recess
   2. Chair asked for comments and/or suggestions for the comments. 🡪 Heard none.
   3. The agenda for Wednesday PM2 was approved.
4. Presentations
   1. Laurent Cariou (Intel) presented “Clarification for OBSS\_PD-based SR parameters,” based on the submission 11-16-0945-01.
      1. Summary
         1. Proposed to fill the TBDs in the spec by defining default parameters for OBSS\_Pdmin/max and PWRref which the AP can adaptively change.
         2. Proposed to clarify that SR\_disallow in HE-SIGA only disallow SRP-based SR
      2. Discussions
         1. C (Slide 15): Background of choosing these parameters are not clear enough. Do not understand why 3 spatial streams is the break point.
         2. A member commented that it is not clear how a device sets the power reference. 🡪 Default parameters in slide 15 are out-of-box conditions.
         3. Another member commented that it is not clear what we can get from SR. Simulation works are needed.
         4. There was a comment that what we need to specify is the rules for SR. In the original DSC, the TPC is not effective.
      3. Laurent presented the spec text “Proposed Text Changes for OBSS\_PD-based SR parameters,” based on the submission 11-16-0947-04.
         1. Discussions
            1. A member commented on the SR disallow mode: There will be certain condition that a STA sets SR disallow flag. It is not clear what will be motivation for a STA to set this parameter.
            2. Another member commented that the condition(s) to disallow SPR-based SR shall be provided.
            3. A member pointed out that there are some TBDs.
5. TG Motions
   1. **SR Motion #9: Move to include the text in doc 11-16/0971r2 related to DSC in the next revision of the TG draft**
      1. **Moved by Graham Smith, Seconded by Sean Coffey.**
      2. Discussions
         1. A member commented that the document 16/971r2 contains fundamental flaw.
         2. Another member mentioned that it is beneficial to include text in the draft.
         3. There was an opinion that the proposed text is more appropriate to be considered in TGmc.
         4. There was a comment that this proposal violates the PAR.
      3. **Result: After long discussions, motion was withdrawn.**
   2. **SR Motion #10: Move to accept the proposed text changes in document “11-16/0947r4, for OBSS\_PD-based SR parameters” and include the changes in the next revision of the TG draft**
      1. **Moved by Laurent Cariou, Seconded by Ron Porat.**
      2. Discussions
         1. Some members expressed objection to conduct this motion since not enough information is provided.
         2. Chair determined this motion to be recorded vote.
      3. **Result: Y/N/A = 59/21/29, motion fails.**
         1. **The vote record is provided in the Appendix A.**
6. AoB

No time to conduct any other business.

1. Recess
   1. TGax is in recess until the start of Thurday AM2 (10:30 AM).

**Thursday, July 28th, 2016, AM2 TGax full Session (10:30-12:30)**

1. **The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chairperson of the TGax, @10:32 AM**
   1. Agenda 16/0779r5 is on the server. Rev. 6 is the working document.
2. **Announcement/Reminder**
   1. Chair reminded IEEE 802 and 802.11 IPR P&P.
   2. Chair asked people to state name and affiliation when addressing for the first time in the session.
   3. Chair reminded people to do attendance.
3. **Agenda for this session**
   1. Thursday AM2 and PM1
      1. Call Meeting to order
      2. Announcement/Reminder
         1. IEEE 802 and 802.11 IPR Policy and procedure.
         2. Attendance
      3. Agenda Setting
      4. Presentations (if any)
      5. TG Motions
      6. Timeline update
      7. Goals for September 2016
      8. Conference Calls Schedule
      9. AOB
      10. Adjourn
   2. Chair asked if there are any modifications to the agenda.
   3. Agenda approved without objections.
4. **Presentations – No presentation left.**
5. **Motions**
   1. **SR Motion**
      1. **SR Motion #11: Move to accept the proposed text changes in document 11-16/0902r3 and include the changes in the next revision of the TG draft.**
         1. **Moved by Daewon Lee, Seconded by Ron Porat**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
   2. **PHY Motions**
      1. **PHY Motion #158: Move to include the spec text change as shown in doc 11/16-0892r0 to the next revision of the TG draft.**
         1. **Moved by Hongyuan Zhang, Seconded by Bo Sun.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection**
      2. **PHY Motion #159: Move to include the spec text changes as shown in doc 11/16-0895r0 in the next revision of the TG draft, which reflects Straw Polls 1~3 in doc 11-16/0894r0.**
         1. **Moved by Hongyuan Zhang, Seconded by Bo Sun.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      3. **PHY Motion #160: Move to include the spec text changes as shown in doc 11/16-0897r1 in the next revision of the TG draft.**
         1. **Moved by Hongyuan Zhang, Seconded by Bo Sun.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      4. **PHY Motion #161: Move to include the spec text changes as shown in doc 11/16-0899r0 (reflects the content of SP1 in doc 11-16/0898r0) to the next revision of the TG draft**
         1. **Moved by Hongyuan Zhang, Seconded by Bo Sun.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      5. **PHY Motion #162: Move to add the spec text changes to D0.2 on Table 26-20 – Fields in the HE-SIG-A for an HE SU PPDU and HE Extended Range SU PPDU as shown in doc 11/16-0915r0**
         1. **Moved by Bin Tian.**
         2. **Result: This motion was not conducted.**
      6. **PHY Motion #163: Move to include the spec text change as shown in doc 11/16-0909r2 in the next revision of the TG draft.**
         1. **Moved by Joonsuk Kim, Seconded by Bo Sun.**
         2. **Discussion - No discussion.**
         3. **Result: Motion passes with no objection.**
      7. **PHY Motion #164: Move to include the spec text changes in doc 11-16/0915r2 in the next revision of the TG draft.**
         1. **Moved by Brian Hart, Seconded by Bo Sun.**
         2. **Discussion – No discussion.**
         3. **Result: Motion accepted with no objection.**
      8. **PHY Motion #165: Move to add to the next revision of the TG draft:**
         * **Add at the end of section 26.3.7.1 the following sentence:**
         * **In a HE MU PPDU transmission, at least Nx4x26 tones (contiguous or non-contiguous), where N is the number of 20MHz channels’ legacy preambles present, shall be occupied throughout the signaled BW**
         1. **Moved by Ron Porat, Seconded by Bo Sun.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
   3. **MU Motions**
      1. **MU Motion #57: Move to add the following to the next revision of the TG draft:**
      * ***Insert the following at the end of 10.22.2.2:***
        + **When an HE STA successfully receives the corresponding acknowledgement frame in response to the MPDU sent in HE trigger based PPDU, the backoff for the associated EDCAF resumes the backoff counter countdown**
      * ***Insert the following at the end of 10.22.2.2:***
        + **When an HE STA does not receive the corresponding acknowledgement frame in response to the MPDU sent in HE trigger based PPDU, the backoff for the associated EDCAF resumes the backoff counter countdown**
      * ***Insert the following at the end of 10.22.2.2:***
        + **If an HE STA does not successfully receive the corresponding acknowledgement frame in response to the MPDU sent in an HE trigger based PPDU, the short retry counters and long retry counters for the associated EDCAF are not changed**
        1. **Moved by Kiseon Ryu, Seconded by Simone Merlin.**
        2. **Discussion – No discussion.**
        3. **Result: Motion passes with no objection.**
   4. **MAC Motions**
      1. **MAC Motion #85: Move to add the following text to the TG draft:**
         * **The Queue Size subfield is an 8-bit field that indicates the amount of buffered traffic, for a given TC or TS at the STA sending this frame.**
         * ***An HE non-AP STA uses the Queue Size subfield to indicate the amount of buffered traffic intended for the STA identified by the receiver address of the frame containing the QoS Control field.***
         1. **Moved by Pascal Vigar, Seconded by Stephane Baron.**
         2. **Discussion - No discussion.**
         3. **Result: Motion passes with no objection.**
      2. **MAC Motion #86: Move to add the following text to the TG draft:**
         * **Add to clause #9.3.1.23**
         * **“Per User Info fields with AID = 0 shall be allocated only after Per User Info fields with AID not equals to 0, if any, and before the MAC padding field, if present.”**
         1. **Moved by Zhou Lan, Seconded by Reza Hedayat.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
   5. **CR Motions**
      1. **CR Motion #15: Move to approve resolutions of CIDs, 9, 228, 2219, 2422, 2691, 2900 in doc 11-16/0725r3.**
         1. **Moved by Raja Banerjea, Simone Merlin.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      2. **CR Motion #16: Move to approve resolutions to CIDs, 55, 1000, 1221, 1915, 2234, 802,1695, 1222, 182, 971,2713, 702, 1916, 2233, 223 in doc 11-16/0773r2.**
         1. **Moved by Raja Banerjea, Robert Stacy.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      3. **CR Motion #17: Move to accept resolutions to CIDs, 262,1083, 102, 612, 660, 830, 864, 1716, 2215, 2301, 2376, 372, 719, 864 in doc 11-16/0774r1.**
         1. **Moved by Raja Banerjea, Simone Merlin.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      4. **CR Motion #18: Move to approve resolutions to CIDs, 101,103, 104,374,375, 377, 558, 561, 661, 662, 664, 688, 1296, 1299, 1301, 1717, 1718, 1882, 2113, 2114, 2174, 2217, 2302, 2421, 227, 720, 663,1303,1305,1306 in doc 11-16/0780r1**
         1. **Moved by Raja Banerjea, Simone Merlin.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      5. **CR Motion #19: Move to approve resolutions to CIDs, 340, 341, 342, 343, 1023, 2734, and 2889 in doc 11-16/0775r2**
         1. **Moved by Lochan Verma, Seconded by Sameer Vermani.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      6. **CR Motion #20: Move to approve resolutions of CIDs, 855, 1064, 1, 784, 90, 94, 654, 453, 1181, 2249, 2297, 2208, 2406, 2576, 2901, 2902, 2903, 2405, 2904, 1254, 1255, 1256, 1202, 1714, 1761, 1762, 1881, 1418 in doc 11-16/766r1**
         1. **Moved by Alfred Asterjadhi, Seconded by Young Hoon Kwon.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      7. **CR Motion #21: Move to approve resolutions of CIDs, 1126, 1127, 1179, 58, 89, 361, 2248, 1877, 1878, 792, 686, 687, 793, 1133, 91, 92, 362, 363, 2296, 1712, 1713, 1250, 1253, 1711, 2204, 2205, 2206, 211, 364, 1231, 134, 1750, 1244 in doc 11-16/0798r0**
         1. **Moved by Alfred Asterjadhi, Seconded by Simone Merlin.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      8. **CR Motion #22: Move to approve resolutions to CIDs, 14, 127, 370, 371, 2602 in doc 11-16/0815r2**
         1. **Moved by Young Hoon Kwon, Seconded by Yongho Seok.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      9. **CR Motion #23: Move to approve resolutions to CIDs, 961, 1137, 804, 212, 2212, 2412, 2413, 1136, 1493 in doc 11-16/0819r1**
         1. **Moved by Alfred Asterjadhi, Seconded Yasuhiko Inoue.**
         2. **Discussion – No discussion.**
         3. **Result: Motion passes with no objection.**
      10. **CR Motion #24: Move to approve resolutions to CIDs, 824, 93, 1067, 2388, 45, 178, 254, 438, 680, 769, 770, 771, 817, 818, 1062, 1065, 1066, 1550, 2189, 2190, 2191, 2272, 2711, 147 in doc 11-16/0806r0**
          1. **Moved by Alfred Asterjadhi, Seconded by Matt Fischer.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      11. **CR Motion #25: Move to approve the resolutions to CIDs, 963, 128, 214, 2171, 2428, 692, 124, 2906, 2840, 2603, 2599, 1209, 2264, 15, 13, 126, 1071, 693, 1768, 401, 1727, 403, 1644, 2281, 2282, 2279, 160 in doc11-16/0807r2**
          1. **Moved by Po-Kai Huang, Seconded by Yongho Seok.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      12. **CR Motion #26: Move to accept the resolutions of CIDs, 1311, 2223, 110, 2587, 8, 2222, 1068, 1310, 1312, 2588, 2601, 2894, 1204, 2907 in doc 11-16/0808r2.**
          1. **Moved by Po-Kai Huang, Seconded by Kiseon Ryu.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      13. **CR Motion #27: Move to approve resolutions to CIDs, 2517, 1780, 1923, and 1610 in doc 11-16/0813r5.**
          1. **Moved by Bo Sun, Seconded by Hongyuan Zhang.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      14. **CR Motion #28: Move to approve resolutions to CIDs, 112, 380, 381, 456, 539, 689, 690, 1154, 1316, 1862 in doc 11-16/0836r1.**
          1. **Moved by Lochan Verma, Seconded by Sriram Venkateswaran.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      15. **CR Motion #29: Move to approve resolution to CID 2183 in document 11-16/0816r1.**
          1. **Moved by Daewon Lee, Seconded by Young Hoon Kwon.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      16. **CR Motion #30: Move to approve the resolutions to CIDs, 2007, 2005, 2123, 2747, 2746, 2244, 842, 846, 526, 910 in doc 11-16/0872r2.**
          1. **Moved by Ross Jian Yu, Seconded by Bo Sun.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      17. **CR Motion #31: Move to approve resolutions to CIDs, 302, 2040, 2132, 2680, 2039, 2038, 1001,479, 2150 in doc 11-16/0873r1.**
          1. **Moved by Ross Jian Yu, Seconded by Bo Sun.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      18. **CR Motion #32: Move to approve resolutions to CIDs, 2032, 2549, 2133, 2548, and 1009 in doc 11-16/1021r2**
          1. **Moved by Ross Jian Yu, Seconded by Bo Sun.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      19. **CR Motion #33: Move to approve the resolutions to CIDs, 1052, 2519 in doc 11-16/0900r1**
          1. **Moved by Robert Stacy, Seconded by Sriram Venkateswaran.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      20. **CR Motion #34: Move to approve the resolution to CID 854 in doc 11-16/0908r1.**
          1. **Moved by Joonsuk Kim, Seconded by Yongho Seok.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      21. **CR Motion #35: Move to approve the resolutions to CIDs, 1659, 493, 494 in doc 11-16/0920r3**
          1. **Moved by Xiaogang Chen, Seconded by Bo Sun.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      22. **CR Motion #36: Move to approve the resolutions to the CIDs, 1782, 2082, 2083 in doc 11-16/0922r2**
          1. **Moved by Sriram Venkateswaran, Seconded by Bo Sun.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      23. **CR Motion #37: Move to approve the resolutions to CIDs, 836 883 884 1930 2247 292 525 904 906 908 1984 1990 1995 1988 1994 1058 1992 1991 1985 1989 1684 523 1857 271 1412 1195 1996 2532 2120 2098 293 1987 1993 2748 2749 in doc 11-16/0937r7.**
          1. **Moved by Rui Cao, Seconded by Bo Sun.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      24. **CR Motion #38: Move to approve resolutions to CIDs, 482, 1867, 2084, 2085 in doc 11-16/0923r1.**
          1. **Moved by Sriram Venkateswaran, Seconded by none.**
          2. **Discussion - This motion needs presentation.**
          3. **Result: This motion was skipped (not conducted).**
      25. **CR Motion #39: Move to approve resolutions to CIDs, 22, 23, 24, 136, 414, 415, 587, 694, 21, 1213, 2615, 1442, 1443, 1756, 1769, 2231 in doc 11-16/0829r3.**
          1. **Moved by Reza Hedayat, Seconded by Brian Hart.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      26. **CR Motion #40: Move to approve resolutions to CIDs, 1275, 1270, 1269, 1139, 97, 2213, 1809, 1808, 1807, 1806 in doc 11-16/0867r2.**
          1. **Moved by George Cherian, Seconded by Brian Hart.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      27. **CR Motion #41: Move to approve resolutions to CIDs, 76, 194, 258, 259, 1598, 1773, 2849 in doc 11-16/0844r2.**
          1. **Moved by Alfred Asterjadhi, Seconded by Brian Hart.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      28. **CR Motion #42: Move to approve resolutions to CIDs, 1482, 1481, 1480, 1479, 1478, 1476, 1475, 1474, 1473, 30, 1225, 1486, 967, 750, 697, 696, 1793, 424, 167, 2629, 2628, 2627, 2626, 2269, 1484, 1485, 1794, 1662, 1487, 2197, 2464, 2465, 1470, 165, 1217 in doc 11-16/0828r0.**
          1. **Moved by Alfred Asterjadhi, Seconded by Brian Hart.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      29. **CR Motion #43: Move to approve resolutions to CIDs, 2484, 2483, 2482, 2481, 2430, 2429, 2489 in doc 11-16/0860r1.**
          1. **Moved by Yongho Seok, Seconded by Brian Hart.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      30. **CR Motion #44: Move to approve the resolutions to CIDs, 73, 210, 192, 642, 1593, 1919, 643, 1595, 2259, 2260 in doc 11-16/0862r3.**
          1. **Moved by Yongho Seok, Seconded by Young Hoon Kwon.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      31. **CR Motion #45: Move to approve resolutions to CIDs, 2608, 2607, 2606, 2488, 2487, 1399, 2841 in doc 11-16/0861r2.**
          1. **Moved by Yongho Seok, Seconded by Brian Hart.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      32. **CR Motion #46: Move to approve the resolution to CID 2596 in doc 11-16/0953r2 and includes the text changes in the TG draft.**
          1. **Moved by Po-Kai Huang, Seconded by Young Hoon Kwon.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      33. **CR Motion #47: Move to approve resolutions to CIDs, 705, 2437, 2436, 2439, 2440 in doc 11-16/0879r2.**
          1. **Moved by Jeongki Kim, Seconded by Young Hoon Kwon.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      34. **CR Motion #48: Move to approve resolutions to CIDs, 62, 640, 2434, 2438, 703, 2435, 66, 257, 447, 186, 2661, 2662, 776, 2660, 1577, 2332, 2718 in doc 11-16/0889r1.**
          1. **Moved by Young Hoon Kwon, Seconded by Yongho Seok.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      35. **CR Motion #49: Move to approve resolutions of CIDs, 1070, 2226, 693, 125, 2650, 2651 in doc 11-16/0875r2.**
          1. **Moved by Kiseon Ryu, Seconded by Po-Kai Huang.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      36. **CR Motion #50: Move to approve the resolutions of CIDs, 768, 829, 978, 1546, 1295, 2710, 2709, 2187, 2647, 2266 in doc 11-16/0876r2.**
          1. **Moved by Kiseon Ryu, Seconded by Po-Kai Huang.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      37. **CR Motion #51: Move to approve the resolutions of CIDs, 2890, 2896, 1634 in doc 11-16/0870r0.**
          1. **Moved by Zhou Lan, Seconded by Young Hoon Kwon.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      38. **CR Motion #52: Move to approve resolution to CID 783 in doc 11-16/0877r5.**
          1. **Moved by Jeongki Kim, Seconded by Kiseon Ryu.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      39. **CR Motion #53: Move to approve resolutions of CIDs, 162, 2444, 2443, 2623 in doc 11-16/0835r1.**
          1. **Moved by Alfred Asterjadhi, Seconded by Po-Kai Huang..**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      40. **CR Motion #54: Move to approve resolutions to CIDs 507, 949, 1005, 1785, 1862 in doc 11-16/0866r4.**
          1. **Moved by Kome Oteri, Seconded by Xiaofei Wang.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
      41. **CR Motion #55: Move to approve resolutions to CIDs, 482, 1867, 2084, 2085 in doc 11-16/0923r1.**
          1. **Moved by Sriram Venkateswaran, Seconded by Ron Porat.**
          2. **Discussion – No discussion.**
          3. **Result: Motion passes with no objection.**
6. **AOB**
   1. A member informed the group that some of the motions was moved by an individual who had lost the voting right. Those motions will be taken care of during PM1 session.
7. **Recess**
   1. TGax is in recess @ 12:28 PM until PM1 (13:30) today.

**Thursday, July 28th, 2016, PM1 TGax full Session (13:30-15:30)**

1. **The meeting called to order by Osama Aboul-Magd (Huawei Technologies)**
   1. The agenda file: 11-16-0977-05.
2. **Announcement**
   1. Chair reminded IEEE 802 and 802.11 IPR P&P.
   2. Chair asked people to state name and affiliation when addressing for the first time in the session.
   3. Chair reminded people to do attendance.
3. **TG Motions (continued)**
   1. **CR Motions (continued)**
      1. **CR Motion #56: Move to approve resolutions of CIDs, 9, 228, 2219, 2422, 2691, 2900 in doc 11-16/0725r3.**
         1. **Moved by Alfred Asterjadhi, Seconded by Simone Merlin.**
         2. **Note - This motion originally was the CR Motion #15 which was moved be a member who had lost the voting right.**
         3. **Discussion – No discussion.**
         4. **Result: Motion passes with no objection.**
      2. **CR Motion #57: Move to approve resolutions to CIDs, 55, 1000, 1221, 1915, 2234, 802,1695, 1222, 182, 971,2713, 702, 1916, 2233, 223 in doc 11-16/0773r2.**
         1. **Moved by Alfred Asterjadhi, Seconded by Simone Merlin.**
         2. **Note – This motion originally was the CR Motion #16 moved by an individual who had lost the voting right.**
         3. **Discussion – No discussion.**
         4. **Result: Motion passes with no objection.**
      3. **CR Motion #58: Move to accept resolutions to CIDs, 262,1083, 102, 612, 660, 830, 864, 1716, 2215, 2301, 2376, 372, 719, 864 in doc 11-16/0774r1.**
         1. **Moved by Alfred Asterjadhi, Seconded by Simone Merlin.**
         2. **Note – This motion originally was the CR Motion #16 moved by an individual who had lost the voting right.**
         3. **Discussion – No discussion.**
         4. **Result: Motion passes with no objection.**
      4. **CR Motion #59: Move to approve resolutions to CIDs, 101,103, 104,374,375, 377, 558, 561, 661, 662, 664, 688, 1296, 1299, 1301, 1717, 1718, 1882, 2113, 2114, 2174, 2217, 2302, 2421, 227, 720, 663,1303,1305,1306 in doc 11-16/0780r1.**
         1. **Moved by Alfred Asterjadhi, Seconded by Simone Merlin.**
         2. **Note – This motion originally was the CR Motion #16 moved by an individual who had lost the voting right.**
         3. **Discussion – No discussion.**
         4. **Result: Motion passes with no objection.**
4. **Presentations**
   1. **George Cherian (Qualcomm) presented “CIDs for: Section 9.3.1.9.7 Multi STA BAs,” based on the submission 11-16-0868-00.**
      1. Summary
         1. This submission proposes resolutions for multiple comments related to TGax D0.1 with the following CIDs (31 CIDs)
            1. 80, 1284, 1182, 1143, 1286, 962, 1287, 831, 508, 367, 100, 99, 98, 999, 1812, 2580, 2458, 2414, 2389, 2232, 2185, 2170, 1285, 1813, 2582, 1811, 1810, 1715, 1291, 1288, 1814.
      2. Discussion
         1. CID #2389 will be resolved in another submission.
      3. Motion
         1. **CR Motion #60: Move to accept resolutions to CIDs, 80, 1284, 1182, 1143, 1286, 962, 1287, 831, 508, 367, 100, 99, 98, 999, 1812, 2580, 2458, 2414, 2232, 2185, 2170, 1285, 1813, 2582, 1811, 1810, 1715, 1291, 1288, 1814 in doc 11-16/0868r1**
            1. **Moved by George Cherian, Seconded by Simone Merlin.**
            2. **Discussion – No discussion.**
            3. **Result: Motion accepted with no objection.**
   2. **Woojin Ahn (Wilus Institute) presented “TID value of ALL ACK signaling,” based on the submission 11-16-0916-01.**
      1. Summary
         1. The TID value for BA information in case of all ACK was discussed.
         2. Without proper TID value setting rule, originator may not distinguish single MPDU ACK and all ACK upon reception of M-BA.
         3. Proposed to Set TID value of All ACK to one of values between 1000-1110.
      2. Discussion – No discussion.
      3. Motion
         1. **MAC Motion #87: Move to include the spec text change as shown in doc 11/16-0917r1 in the TG draft**
            1. **Moved by Woojin Ahn, Seconded by John Son.**
            2. **Discussion**

**This motion will be confirmed if correct clause number is captured.**

* + - * 1. **Result: Motion passes with no objection.**
  1. **Kaushik Josiam (Samsung) presented “Proposed resolutions to comments on clause 26.3.9.8,” based on the submission 11-16-0928-01.**
     1. Summary
        1. The resolutions for the following CIDs are contained in this document.
           1. CIDs #: 306, 310, 311, 477, 1002, 1003, 1010, 1692, 2020, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2036, 2037, 2130, 2151, 2245, 2246, 2543, 2544, 2545, 2546, 2547, 2679, 2681.
     2. Discussion
        1. There were comments on the resolutions for CIDs 1010 and 2151 whether these comments are relevant for DL MU only. The presenter will clarify those points.
     3. Motion
        1. **CR Motion #61: Move to approve resolutions to CIDs, 306, 310, 311, 477, 1002, 1003, 1010, 1692, 2020, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2036, 2037, 2130, 2151, 2245, 2246, 2543, 2544, 2545, 2546, 2547, 2679, 2681 in doc 11-16/0928r2.**
           1. **Moved by Kaushik Josiam, Seconded by Bo Sun**
           2. **Discussion – No discussion.**
           3. **Result: Motion was accepted with no objection.**
  2. **Chittabrata Ghosh (Intel) presented “Resolution for CID 1589, 1590, 2668, and 2669 on Multi-TID Aggregation in Sub-clause 25.10.4,” based on the submission 11-16-0938-00.**
     1. Summary
        1. The resolutions for the following CIDs and relevant text are proposed.
           1. CIDs #1589, 1590, 2668, and 2669.
     2. Discussion
        1. C: Relevant MIB (dot11AMPDUwithMultipleTIDOptionImplemented) needs to be specified in Annex C. 🡪 One of the next action items.
     3. Motion
        1. **CR Motion #62: Move to approve resolutions to CIDs, 1589, 1590, 2668, and 2669 in doc 11-16/0938r0.**
           1. **Moved by Chittabrata Ghosh, Seconded Yasuhiko Inoue.**
           2. **Discussion – No discussion.**
           3. **Result: Motion accepted with no objection.**

1. **Teleconference planning**
   1. Chair suggested weekly conference calls.
      1. Thursday, August 4th, 2016, 20:00 - 22:00 (ET) – already approved.
      2. Thursday, August 11th, 25th & September 8th, 2016, 10:00 - 12:00 (ET)
      3. Thursday, August 18th & September 1st, 2016, 20:00 - 22:00 (ET)
   2. Chair asked if there is any objection to this plan. 🡪 No objection.
2. **Presentations**
   1. **Jarkko Kneckt (Apple) presented “SU Multi-TID rules,” based on the submission 11-16-0913-00.**
      1. Summary
         1. This submission discusses how to use the multi-TID aggregation in SU TXOPs.
         2. Also, the resolutions for CIDs #71 and 190 are provided.
      2. Discussion
         1. There was a discussion on TXOP Limit – Which AC should be assumed? 🡪 The answer was the primary AC.
      3. Motion
         1. **CR Motion #63: Move to approve resolutions to CIDs, 71 and 190 in doc 11-16/966r0**
            1. **Moved by Jarkko Kneckt, Seconded by Alfred Asterjadhi.**
            2. **Discussion – No discussion.**
            3. **Result: Motion accepted with no objection.**
   2. **Jeongki Kim (LG Electronics) presented “Comment resolution on CID 782 (Intra-PPDU PS),” based on the submission 11-16-0878-01.**
      1. Summary
         1. The resolution for the CID #782 and related text are proposed.
         2. Conditions for identification of Intra-BSS PPDU for the VHT case and other cases were added.
      2. Discussion
         1. There was a request to double check the definition of Partial AID. The presenter agreed to do so.
      3. Motion
         1. **CR Motion #64: Move to approve resolution to CID 782 in doc 11-16/0878r1.**
            1. **Moved by Jeongki Kim, Seconded by Kiseon Ryu.**
            2. **Discussion – No discussion.**
            3. **Result: Motion was accepted with no objection.**
3. **AOB**
   1. **No other business that fit with 2 or 3 minutes.**
4. **Adjournment**
   1. TGax adjourned for the week @ 15:28.

**Appendix A. Vote Record for SR Motion #10**

|  |  |
| --- | --- |
| Yes | 59 |
| No | 21 |
| Abstain | 49 |
| Abstain % | 38.0% |
| Approve % | 73.8% |
| Membership valid as of | 2016-07-14 |
| # voting members | 428 |
| # votes | 129 |
| # return | 30 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LastName | FirstName | MI | Affiliation | Vote |
| Aboulmagd | Osama | S | Huawei Technologies Co. Ltd |  |
| Abraham | Santosh | P | Qualcomm Technologies Incorporated |  |
| Abu Surra | Shadi | A | SAMSUNG |  |
| Adachi | Tomoko |  | TOSHIBA Corporation |  |
| Agardh | Kare |  | Sony Mobile Communications |  |
| Ahn | Jinsoo |  | Yonsei University | A |
| Ahn | Seung Hyeok |  | Newracom Inc. |  |
| Ahn | Woojin |  | WILUS | A |
| Akhmetov | Dmitry |  | Intel Corporation |  |
| Aldana | Carlos | H | Intel Corporation |  |
| Alpert | Yaron |  | Intel Corporation | Y |
| An | Song-Haur |  | INDEPENDENT |  |
| Ansley | Carol |  | ARRIS Group | A |
| Aoki | Tsuguhide |  | TOSHIBA Corporation | A |
| Armstrong | Lee | R | US Department of Transportation |  |
| Arndt | Manfred |  | Hewlett Packard Enterprise |  |
| Arnold | James |  | US Department of Transportation |  |
| Asai | Yusuke |  | NTT | A |
| Asterjadhi | Alfred |  | Qualcomm Incorporated | Y |
| Au | Kwok Shum | S | Huawei Technologies Co. Ltd |  |
| Auluck | Vijay |  | Intel Corporation |  |
| Awater | Geert | A | Qualcomm Incorporated |  |
| Azizi | Shahrnaz |  | Intel Corporation | A |
| Bagby | David |  | Calypso Ventures, Inc. | A |
| Baik | Eugene |  | Qualcomm Incorporated |  |
| bang | saehee |  | LG ELECTRONICS |  |
| baron | stephane |  | Canon Research Centre France | A |
| Barr | David |  | Intel Corporation |  |
| Barriac | gwendolyn |  | Qualcomm Incorporated |  |
| Berens | Friedbert |  | FBConsulting Sarl |  |
| Berger | Christian |  | Marvell Semiconductor, Inc. | A |
| Bhandaru | Nehru |  | Broadcom Corporation |  |
| Bharadwaj | Arjun |  | Qualcomm Incorporated |  |
| Bims | Harry |  | Bims Laboratories, Inc. | A |
| Bocus | Mohammud |  | Toshiba of Europe Ltd. |  |
| Bourdoux | Andre |  | IMEC |  |
| Brandt | David |  | Rockwell Automation |  |
| Buffington | John |  | Itron Inc. | N |
| Calcev | George |  | Huawei R&D USA | A |
| Calvert | Chris |  | Landis Gyr Group Worldwide |  |
| cao | fengming |  | Toshiba of Europe Ltd. |  |
| Cao | Rui |  | Marvell Semiconductor, Inc. | Y |
| Capar | Cagatay |  | Ericsson |  |
| Cariou | Laurent |  | Intel Corporation | Y |
| Carney | William |  | Sony Corporation |  |
| CHANG | SANGHYUN |  | SAMSUNG ELECTRONICS |  |
| Chang | Soo-Young |  | California State University, Sacramento (CSUS) |  |
| Chen | Jiamin |  | HUAWEI |  |
| CHEN | KWANG-CHENG |  | National Taiwan University |  |
| Chen | Lidong |  | National Institute of Standards and Technology (NIST) |  |
| Chen | Teyan |  | Huawei Technologies Co. Ltd |  |
| Chen | Xiaogang |  | Intel Corporation | Y |
| Cheng | Paul |  | MediaTek Inc. |  |
| Cheong | Minho |  | Newracom Inc. | Y |
| CHERIAN | GEORGE |  | Qualcomm Incorporated | Y |
| Cherniavsky | Dmitry |  | SiBEAM, Inc. |  |
| Chin | Woon Hau |  | Toshiba of Europe Ltd. |  |
| Chitrakar | Rojan |  | Panasonic Asia Pacific Pte Ltd. | N |
| Cho | Hangyu |  | lg electronics | Y |
| Cho | Joongwon |  | Newracom Inc. |  |
| Choi | Hyeyoung |  | LG ELECTRONICS |  |
| Choi | In-Kyeong |  | Newracom Inc. | N |
| Choi | Jinsoo |  | LG ELECTRONICS | Y |
| Choi | Sangsung |  | Electronics and Telecommunications Research Institute (ETRI) |  |
| Choudhury | Sayantan |  | Nokia |  |
| Chu | Liwen |  | Marvell Semiconductor, Inc. | Y |
| Ciochina | Dana |  | Sony Corporation |  |
| Coffey | John |  | Realtek Semiconductor Corp. | N |
| Cordeiro | Carlos |  | Intel Corporation |  |
| De Ruijter | Hendricus |  | Silicon Laboratories |  |
| de Vegt | Rolf | J | Qualcomm Incorporated |  |
| Debergh | Pierre |  | Orange | Y |
| Ding | Gang |  | Qualcomm Incorporated |  |
| DOAN | DUNG |  | Qualcomm Incorporated |  |
| Dua | Praveen |  | Qualcomm Incorporated |  |
| Eastlake 3rd | Donald | E | Huawei Technologies Co. Ltd |  |
| Ecclesine | Peter |  | Cisco Systems, Inc. |  |
| Edgar | Richard |  | Imagination Technologies Ltd. | A |
| Eitan | Alecsander |  | Qualcomm Incorporated |  |
| Emmelmann | Marc |  | Self Employed |  |
| Erceg | Vinko |  | Broadcom Corporation |  |
| Fan | Zhong |  | TOSHIBA Corporation |  |
| Fang | Ping |  | Huawei Technologies Co. Ltd |  |
| Fang | Yonggang |  | ZTE TX Inc |  |
| Ferdowsi | Vida |  | Newracom Inc. |  |
| Filo | Marcin |  | University of Surrey |  |
| Finn | Norman |  | Cisco Systems, Inc. |  |
| Fischer | Matthew | J | Broadcom Corporation |  |
| Fischer | Michael |  | NXP Semiconductors |  |
| Fuller | Richard |  | OmniTrail Technologies |  |
| Furuichi | Sho |  | Sony Corporation |  |
| Gan | Ming |  | Huawei Technologies Co. Ltd | Y |
| Garcia Villegas | Eduard |  | Universitat Politecnica de Catalyuna (UPC) |  |
| Ghanbarinejad | Majid |  | Huawei R&D USA | A |
| Ghosh | Chittabrata |  | Intel Corporation | Y |
| Ghosh | Monisha |  | InterDigital, Inc. |  |
| Godfrey | Tim |  | Electric Power Research Institute, Inc. (EPRI) |  |
| Grandhe | Niranjan |  | Marvell Semiconductor, Inc. | A |
| Grigat | Michael |  | Deutsche Telekom AG |  |
| Guo | Yuchen |  | Huawei Technologies Co., Ltd |  |
| Hadad | Zion |  | Runcom Technologies LTD. |  |
| Hall | Robert |  | Johnson Controls Inc |  |
| Halls | David |  | Toshiba of Europe Ltd. | A |
| Hamilton | Mark |  | Ruckus Wireless |  |
| HAN | Xiao |  | Huawei Technologies Co. Ltd |  |
| Han | Yunbo |  | HUAWEI |  |
| Handte | Thomas |  | Sony Corporation |  |
| Hansen | Christopher | J | Peraso Technologies Incorporated |  |
| Hao | Peng |  | jiangsu university of science and technology |  |
| Harkins | Daniel | N | Aruba Networks, Inc. |  |
| Hart | Brian | D | Cisco Systems, Inc. | Y |
| Hartman | Chris |  | Apple, Inc. |  |
| Hayes | Victor |  | CONSULTANT |  |
| He | Linhai |  | Qualcomm Incorporated |  |
| he | shiwen |  | Southeast University, China |  |
| Hedayat | Ahmadreza |  | Newracom Inc. | Y |
| Henry | Jerome |  | Cisco Systems, Inc. |  |
| Hiertz | Guido | R | Ericsson AB |  |
| Ho | Duncan |  | Qualcomm Incorporated |  |
| Horisaki | Koji |  | TOSHIBA Corporation |  |
| Hou | Victor |  | Broadcom Corporation |  |
| Hsieh | Jing-Rong |  | HTC Corporation |  |
| Hsu | Chien-Fang |  | MediaTek Inc. |  |
| Hu | Chunyu |  | Broadcom Corporation | Y |
| Huang | He |  | ZTE Corporation |  |
| Huang | Lei |  | Huawei Technologies Co. Ltd |  |
| Huang | Lei |  | Panasonic Asia Pacific Pte Ltd. | N |
| Huang | Po-Kai |  | Intel Corporation | Y |
| Huang | Rongsheng |  | MediaTek Inc. |  |
| Huang | Zhiyong |  | LitePoint Corporation/Teradyne |  |
| Hunter | David |  | WireFi Networks Inc. |  |
| Hurtarte | Jeorge |  | Teradyne, Inc. |  |
| Hwang | Sung Hyun | H | ETRI |  |
| Ibrahim | Brima |  | Broadcom Corporation |  |
| Inoue | Yasuhiko |  | Nippon Telegraph and Telephone Corporation (NTT) | Y |
| Ishihara | Koichi |  | Nippon Telegraph and Telephone Corporation (NTT) |  |
| Ishizu | Kentaro |  | National Institute of Information and Communications Technology (NICT) |  |
| Iwatani | Junichi |  | Nippon Telegraph and Telephone Corporation (NTT) | Y |
| Jauh | Alan |  | MediaTek Inc. |  |
| Jeffries | Timothy |  | Huawei R&D USA |  |
| Ji | Mingyue |  | Broadcom Corporation |  |
| Jiang | Jinjing |  | Marvell Semiconductor, Inc. |  |
| Jin | Liang |  | Spirent Communications |  |
| Jo | Kyungtae |  | LG ELECTRONICS |  |
| Johnsson | Kerstin |  | Intel Corporation |  |
| Jokela | Jari | E |  |  |
| Jones | Allan |  | Activision | Y |
| Jones | Vincent Knowles IV |  | Qualcomm Incorporated |  |
| Josiam | Kaushik |  | SAMSUNG | Y |
| Kain | Carl | W | Noblis, Inc. |  |
| Kakani | Naveen | K | Qualcomm Incorporated |  |
| Kang | Hyunduk |  | Electronics and Telecommunications Research Institute (ETRI) |  |
| Karnam | Mohan |  | Imagination Technologies Ltd. |  |
| Kasher | Assaf | Y | Qualcomm |  |
| Kennedy | Richard | H | Hewlett Packard Enterprise |  |
| Kerry | Stuart | J | OK-Brit |  |
| Khorov | EVGENY |  | IITP RAS | A |
| Khoury | Peter |  | Ruckus Wireless | N |
| KI | SANGWON |  | Newracom Inc. | A |
| Kim | Jeehoon |  | NEWRACOM |  |
| Kim | Jeongki |  | LG ELECTRONICS | Y |
| Kim | Jin Min |  | LG ELECTRONICS |  |
| Kim | Joonsuk |  | Apple, Inc. | A |
| Kim | Kyeongpyo |  | Newracom Inc. | N |
| Kim | Sang Gook |  | LG ELECTRONICS | A |
| Kim | Suhwook |  | LG ELECTRONICS | A |
| Kim | Yongho |  | KNUT | A |
| Kim | Youhan |  | Qualcomm Incorporated | Y |
| Kim | Youn-Kwan |  | The Catholic University of Korea |  |
| Kirimis | Dimitri |  | Newracom Inc. | A |
| Kiryanov | Anton |  | IITP RAS | N |
| Kitazawa | Shoichi |  | ATR Wave Engineering Laboratories |  |
| Kloper | David |  | Cisco Systems, Inc. |  |
| KNECKT | JARKKO |  | Apple, Inc. | Y |
| Ko | Geonjung |  | WILUS Institute | A |
| Kojima | Fumihide |  | National Institute of Information and Communications Technology (NICT) |  |
| Kolze | Tom |  | Broadcom Corporation |  |
| Kotzer | Igal |  | General Motors Company |  |
| Kountz | Dennis |  | Chemours |  |
| Kraemer | Bruce | P | Marvell Semiconductor, Inc. |  |
| Kumar | Rajesh |  | Qualcomm Incorporated |  |
| Kumari | Warren |  | Google |  |
| Kwak | Byung-Jae |  | Electronics and Telecommunications Research Institute (ETRI) |  |
| Kwak | Jin-Sam |  | WILUS Institute | A |
| Kwon | Yong-Jin |  | Newracom Inc. | A |
| Kwon | Young Hoon | H | Newracom Inc. | Y |
| Lalam | Massinissa |  | SAGEMCOM SAS |  |
| Lambert | Paul |  | Marvell Semiconductor, Inc. |  |
| Lan | Zhou |  | National Institute of Information and Communications Technology (NICT) | Y |
| Lanante | Leonardo |  | Kyushu Institute of Technology | Y |
| Lansford | James |  | Qualcomm Incorporated |  |
| Lee | Daewon |  | Newracom Inc. | Y |
| Lee | Jae Seung | S | ETRI | Y |
| Lee | Jehun |  | Newracom Inc. | A |
| LEE | JOONSOO |  | Newracom Inc. | A |
| Lee | Young Ha |  | Newracom Inc. | N |
| Lei | Zhongding |  | Institute for Infocomm Research (I2R) |  |
| Lepp | James |  | BlackBerry |  |
| Levy | Joseph |  | InterDigital, Inc. |  |
| Li | Bo |  | northwestern polytechnical university |  |
| Li | Dejian |  | Huawei Technologies; HiSilicon |  |
| Li | Guoqing |  | Apple, Inc. |  |
| Li | Huan-Bang |  | National Institute of Information and Communications Technology (NICT) |  |
| Li | Jing |  | Huawei Technologies Co. Ltd |  |
| Li | Qinghua |  | Intel Corporation |  |
| Li | Yanchun |  | Huawei Technologies Co. Ltd |  |
| Li | Yunbo |  | Huawei Technologies Co. Ltd | Y |
| Lim | Dong Guk |  | LG ELECTRONICS | A |
| Lin | Meilu |  | HUAWEI |  |
| Lin | Wei |  | Huawei Technologies Co. Ltd |  |
| Lin | Yingpei |  | Huawei Technologies Co. Ltd |  |
| LIU | CHENCHEN |  | Huawei Technologies Co. Ltd |  |
| Liu | Der-Zheng |  | Realtek Semiconductor Corp. |  |
| Liu | Fulei |  | ZTE Corporation |  |
| Liu | Jianhan |  | MediaTek Inc. | Y |
| Liu | Jinnan |  | HUAWEI |  |
| Liu | Le |  | Huawei Technologies Co. Ltd |  |
| Liu | Pei |  | HiSilicon Technologies Co., LTD. |  |
| Liu | Yong |  | Apple, Inc. | Y |
| Liu | Yun |  | Huawei Technologies Co., Ltd |  |
| Liu | Zhiheng |  | China Mobile Communications Corporation (CMCC) |  |
| Loc | Peter |  | Huawei Technologies Co. Ltd | Y |
| Lomayev | Artyom |  | Intel Corporation |  |
| Lou | Hui-Ling |  | Marvell Semiconductor, Inc. |  |
| Lukaszewski | Chuck |  | Aruba Networks, Inc. |  |
| Luo | Jun |  | Huawei Technologies Co. Ltd |  |
| Luo | Yi |  | Huawei Technologies Co. Ltd |  |
| Lv | Kaiying |  | ZTE Corporation |  |
| Ma | Jing |  | National Institute of Information and Communications Technology (NICT) |  |
| Maamari | Diana |  | Huawei R&D USA |  |
| MADHAVAN | NARENDAR |  | TOSHIBA Corporation | A |
| Maeda | Shigeru |  | TOSHIBA Corporation |  |
| Malik | Rahul |  | Qualcomm Incorporated |  |
| Malinen | Jouni | K | Qualcomm Incorporated |  |
| Maltsev | Alexander |  | Intel Corporation |  |
| Mangold | Stefan |  | Itron Inc. |  |
| Mano | Hiroshi |  | Koden Techno Info K.K. |  |
| Marin | James |  | Self Employed |  |
| Matsuo | Ryoko |  | TOSHIBA Corporation |  |
| Mccann | Stephen |  | BlackBerry |  |
| Merlin | Simone |  | Qualcomm Incorporated | Y |
| Mestanov | Filip |  | Ericsson AB |  |
| Miller | James |  | InterDigital, Inc. |  |
| Mobasher | Amin |  | SAMSUNG |  |
| Mohanty | Bibhu |  | Qualcomm Incorporated |  |
| Monajemi | Pooya |  | Cisco Systems, Inc. | Y |
| Montemurro | Michael |  | Research In Motion Limited |  |
| Montreuil | Leo |  | Broadcom Corporation |  |
| Moon | Sungho |  | Newracom Inc. |  |
| Mori | Hiroki |  | TOSHIBA Corporation |  |
| Mori | Kenichi |  | Space-Time Engineering | N |
| Mori | Masahito |  | Sony Corporation |  |
| Morioka | Hitoshi |  | SRC Software |  |
| Morioka | Yuichi |  | Sony Corporation | Y |
| Motozuka | Hiroyuki |  | Panasonic Corporation | N |
| Mueller | Robert |  | Ilmenau University of Technology - TU Ilmenau |  |
| Murakami | Yutaka |  | Panasonic Corporation |  |
| Murthy | Vinay |  | Qualcomm Incorporated |  |
| Myles | Andrew |  | Cisco Systems, Inc. |  |
| Nabetani | Toshihisa |  | TOSHIBA Corporation |  |
| Nagai | Yukimasa |  | Mitsubishi Electric Corporation |  |
| Nagao | Yuhei |  | Radrix Co., Ltd |  |
| Nakano | Hiroki |  | Kyoto University |  |
| Nandagopalan | SAI SHANKAR | S | Ubilite Inc | A |
| Nezou | Patrice |  | Canon Research Centre France |  |
| Ngo | Chiu |  | SAMSUNG |  |
| Noh | Yujin |  | Newracom Inc. | Y |
| Notor | John |  | Notor Research; ARM, Inc. |  |
| Odman | Knut |  | Broadcom Corporation |  |
| Oh | Minseok |  | Kyonggi University |  |
| OH | MIN-SEOK |  | LG Electronics |  |
| Olesen | Robert |  | InterDigital, Inc. | N |
| Oteri | Oghenekome |  | InterDigital, Inc. | N |
| Ozaki | Kazuyuki |  | FUJITSU LABORATORIES LIMITED | A |
| Palm | Stephen |  | Broadcom Corporation |  |
| Pandey | Santosh Ghanshyam | G | Cisco Systems, Inc. |  |
| Pang | Jiyong |  | Huawei Technologies Co. Ltd |  |
| Pare | Thomas |  | MediaTek Inc. | Y |
| Park | Eunsung |  | LG Electronics | A |
| Park | Hyungu |  | Newracom Inc. | A |
| Park | Hyunhee |  | LG ELECTRONICS | A |
| Park | Jeonghwan |  | Newracom Inc. | Y |
| Park | Minyoung |  | Intel Corporation |  |
| Park | Sung-jin |  | LG ELECTRONICS |  |
| Patil | Abhishek |  | Qualcomm Incorporated | A |
| Peng | Xiaoming |  | Institute for Infocomm Research |  |
| Persson | Hakan |  | Ericsson AB |  |
| Petranovich | James | E | ViaSat, Inc. |  |
| petrick | Albert |  | Jones-Petrick and Associates, LLC. | N |
| Pienciak | Walter |  | IEEE |  |
| Pope | Steve |  | Self Employed |  |
| porat | ron |  | Broadcom Corporation | Y |
| Pulikkoonattu | Rethnakaran |  | Broadcom Corporation |  |
| Pyo | Chang-Woo | C | National Institute of Information and Communications Technology (NICT) |  |
| Qi | Emily | H | Intel Corporation |  |
| Qiao | Dengyu |  | Huawei Technologies Co. Ltd | Y |
| Qu | Shouxing |  | BlackBerry |  |
| Rabarijaona | Verotiana |  | National Institute of Information and Communications Technology (NICT) |  |
| Rajakarunanayake | Yasantha |  | MediaTek Inc. |  |
| Rakanovic | Demir |  | u-blox |  |
| Rantala | Enrico-Henrik |  | Nokia | A |
| Rayment | Stephen G | G | Ericsson AB |  |
| Ren | Yazhen |  | Huawei Technologies Co. Ltd |  |
| Riegel | Maximilian |  | Nokia Networks |  |
| Rison | Mark |  | Samsung Cambridge Solution Centre |  |
| Rong | Zhigang |  | Huawei Technologies Co. Ltd | Y |
| Rosdahl | Jon | W | Qualcomm Technologies, Inc. |  |
| Roy | Arnab |  | InterDigital, Inc. |  |
| Ryu | Kiseon |  | LG ELECTRONICS | Y |
| Sadeghi | Bahareh |  | Intel Corporation | Y |
| Sakamoto | Takenori |  | Panasonic Corporation | N |
| Sakoda | Kazuyuki |  | Sony Corporation |  |
| Sambasivan | Sam |  | AT&T |  |
| Sampath | Hemanth |  | Qualcomm Incorporated |  |
| Sarris | Ioannis |  | u-blox |  |
| Sasaki | Shigenobu |  | Niigata University |  |
| Sato | Naotaka |  | Sony Corporation |  |
| Schelstraete | Sigurd |  | Quantenna Communications, Inc. | N |
| Schneider | Daniel |  | Sony |  |
| Scott | Andy |  | NCTA |  |
| Segev | Jonathan |  | Intel Corporation | A |
| Seok | Yongho |  | Newracom Inc. |  |
| Shah | Kunal |  | Silver Spring Networks Inc. |  |
| SHAO | PENG |  | NEC Communication Systems, Ltd. |  |
| Shen | Bazhong |  | Broadcom Corporation |  |
| Sherlock | Ian |  | Texas Instruments Incorporated | Y |
| Shilo | Shimi |  | HUAWEI | A |
| Shimada | Shusaku |  | Schubiquist Technologies |  |
| SHIN | JUNG-CHUL |  | NEWRACOM |  |
| Slater | Robert |  | Motorola Mobility |  |
| Smith | Graham | K | SR Technologies | N |
| Son | Ju-Hyung |  | WILUS Institute | A |
| Song | Hayeong |  | Newracom Inc. | A |
| Song | Nah-Oak |  | Korea Advanced Institute of Science and Technology (KAIST) |  |
| Srinivasa | Sudhir |  | Marvell Semiconductor, Inc. |  |
| Stacey | Robert |  | Intel Corporation | Y |
| Stanley | Dorothy |  | Hewlett Packard Enterprise |  |
| Stephens | Adrian | P | Intel Corporation |  |
| Stott | Noel |  | Ixia | A |
| SU | HONGJIA |  | Huawei Technologies Co. Ltd |  |
| Suh | JUNG HOON | H | Huawei Technologies Co. Ltd | A |
| Sun | Bo |  | ZTE Corporation | A |
| Sun | Chen |  | Sony Corporation |  |
| Sun | Li-Hsiang |  | InterDigital, Inc. | N |
| sun | sheng |  | Huawei Technologies Co. Ltd |  |
| Sun | Yakun |  | Marvell Semiconductor, Inc. |  |
| Sun | Yanjun |  | Qualcomm Incorporated |  |
| Takahashi | Kazuaki |  | Panasonic Corporation |  |
| Takai | Mineo |  | Space-Time Engineering |  |
| Takatori | Yasushi |  | Nippon Telegraph and Telephone Corporation (NTT) |  |
| Tamhane | Sagar |  | Marvell Semiconductor, Inc. |  |
| Tanaka | Yusuke |  | Sony Corporation | Y |
| Taniguchi | Kentaro |  | TOSHIBA Corporation |  |
| Tao | Wu |  | Huawei Technologies Co. Ltd |  |
| Taori | Rakesh |  | Phazr |  |
| Tian | Bin |  | Qualcomm Incorporated | Y |
| Tian | Qingjiang |  | Qualcomm Incorporated |  |
| Tian | Tao |  | Qualcomm Incorporated |  |
| Tinnakornsrisuphap | Peerapol |  | Qualcomm Incorporated |  |
| Tong | Fei |  | Samsung Cambridge Solution Center |  |
| TorabJahromi | Payam |  | Broadcom Corporation |  |
| Tosato | Filippo |  | Toshiba of Europe Ltd. |  |
| Trainin | Solomon | B | Intel Corporation |  |
| Tsai | Chia-Hung |  | MediaTek Inc. | Y |
| tsubaki | toshimitsu |  | Nippon Telegraph and Telephone Corporation (NTT) |  |
| Tuomaala | Esa |  | Nokia |  |
| Urabe | Yoshio |  | Panasonic Corporation | Y |
| Van Nee | Richard | D | Qualcomm Incorporated |  |
| Van Zelst | Allert |  | Qualcomm Incorporated |  |
| Vangelista | Lorenzo |  | Patavina Technologies |  |
| Varshney | Prabodh |  | Nokia |  |
| Venkatachalam Jayara | Venkata Ramanan |  | Qualcomm Incorporated |  |
| Venkatesan | Ganesh |  | Intel Corporation |  |
| Venkateswaran | Sriram |  | Broadcom Corporation | Y |
| Vermani | Sameer |  | Qualcomm Incorporated | A |
| VIGER | Pascal |  | Canon Research Centre France | A |
| Villardi | Gabriel |  | National Institute of Information and Communications Technology (NICT) |  |
| Vlantis | George | A | STMicroelectronics | N |
| Wang | Chao Chun |  | MediaTek Inc. |  |
| Wang | Haiming |  | Southeast University, China |  |
| Wang | Huizhao |  | Quantenna Communications, Inc. | Y |
| Wang | James June | J | MediaTek Inc. | Y |
| Wang | Lei |  | Marvell Semiconductor, Inc. | Y |
| Wang | Qi |  | Broadcom Corporation |  |
| Wang | Xiaofei |  | InterDigital, Inc. | N |
| Wang | Xuehuan |  | Huawei Technologies Co. Ltd |  |
| Ward | Lisa |  | Rohde & Schwarz |  |
| Watanabe | Fujio |  | NTT DoCoMo, Inc. |  |
| Wee | Gaius |  | Panasonic Asia Pacific Pte Ltd. |  |
| Wentink | Menzo | M | Qualcomm Incorporated |  |
| Wilhelmsson | Leif |  | Ericsson AB |  |
| Wong | Eric |  | Apple, Inc. | A |
| Wu | Tianyu |  | MediaTek Inc. | Y |
| Xin | Yan |  | Huawei Technologies Co. Ltd |  |
| Xing | Weimin |  | ZTE Corporation | Y |
| Xue | Qi |  | Qualcomm Incorporated |  |
| Yamada | Akira |  | NTT DoCoMo, Inc. |  |
| Yang | Ou |  | Intel Corporation |  |
| Yang | Rongzhen |  | Intel Corporation |  |
| YANG | RUI |  | InterDigital, Inc. | A |
| Yang | Xun |  | Huawei Technologies Co. Ltd | Y |
| Yang | Yunsong |  | Huawei Technologies Co. Ltd |  |
| YAO | KE |  | ZTE Corporation |  |
| Yee | James |  | MediaTek Inc. | Y |
| Yee | Peter |  | NSA/IAD |  |
| Yokota | Hidetoshi |  | Landis Gyr Group Worldwide |  |
| Yong | Su Khiong | K | Apple, Inc. |  |
| Young | Christopher |  | Broadcom Corporation |  |
| Yu | Bo |  | Marvell Semiconductor, Inc. |  |
| Yu | Chinghwa |  | Spreadtrum Comm. |  |
| Yu | Heejung |  | Yeungnam University |  |
| Yu | Jian |  | Huawei Technologies Co. Ltd | A |
| Yu | Mao |  | Marvell Semiconductor, Inc. |  |
| Yunoki | Katsuo | D | KDDI R&D Laboratories |  |
| Zeleznikar | Alan |  | ARRIS Group | N |
| Zeng | Kun |  | Huawei Technologies Co., Ltd |  |
| Zhang | Hongyuan |  | Marvell Semiconductor, Inc. | Y |
| ZHANG | JIAYIN |  | Huawei Technologies Co. Ltd |  |
| Zhang | Xingxin |  | Huawei Technologies Co. Ltd |  |
| Zhang | Yan |  | Marvell Semiconductor, Inc. |  |
| ZHAO | XIAOWU |  | ZTE Corporation |  |
| Zheng | Jun |  | Broadcom Corporation |  |
| Zheng | Xiayu |  | Marvell Semiconductor, Inc. |  |
| Zhou | Yan |  | Qualcomm Incorporated |  |
| Zhu | Chunhui |  | Huawei Technologies Co. Ltd |  |
| Zhu | Jun |  | Huawei Technologies Co. Ltd | A |
| Zhuo | Lan |  | CESI Group |  |
| Zuniga | Juan Carlos |  | InterDigital, Inc. |  |