IEEE P802.11  
Wireless LANs

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| UHR SG June 2023 teleconference minutes | | | | |
| Date: 2023-06-01 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
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|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This document contains the minutes for UHR SG June 2023 teleconference.

Revision history:

* Rev0: initial version.

Abbreviations:

* A: Answer
* C: Comment

# 1st Conf. Call: June 1st Thursday (10:00–12:00 ET)

* The Chair, Laurent Cariou (Intel), calls the meeting to order.
* IEEE 802 and 802.11 IPR policy and procedure
  + Patent Policy: Ways to inform IEEE:
    - Cause an LOA to be submitted to the IEEE-SA ([patcom@ieee.org](mailto:patcom@ieee.org)); or
    - Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or
    - Speak up now and respond to this Call for Potentially Essential Patents

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the WG Chair. **Nobody speaks/writes up**.

* + Copyright Policy: Participants are advised that
    - IEEE SA’s copyright policy is described in [Clause 7](https://standards.ieee.org/about/policies/bylaws/sect6-7.html#7) of the IEEE SA Standards Board Bylaws and [Clause 6.1](https://standards.ieee.org/about/policies/opman/sect6.html) of the IEEE SA Standards Board Operations Manual;
    - Any material submitted during standards development, whether verbal, recorded, or in written form, is a Contribution and shall comply with the IEEE SA Copyright Policy

**Copyright Policy was presented.**

* + **Patent, Participation, Copyright and policy related subclause:** Please refer to Patent And Procedures**。**
* Attendance reminder.
  + Participation slide: <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180-05-00EC-ieee-802-participation-slide.pptx>
  + Please record your attendance during the conference call by using the IMAT system:
    - 1) login to [imat](https://imat.ieee.org/attendance), 2) select “802.11 Telecons (<Month>)” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “<UHR SG > conference call that you are attending.
  + If you are unable to record your attendance contact Laurent Cariou ([laurent.cariou@intel.com](mailto:laurent.cariou@intel.com)) and Ross Jian Yu ([ross.yujian@huawei.com](mailto:ross.yujian@huawei.com)) for assistance
  + Please ensure that the following information is listed correctly when joining the call:
    - "[voter status] First Name Last Name (Affiliation)"
* Agenda
  + Chair reviews proposed agenda found in [11-23-0934r](https://mentor.ieee.org/802.11/dcn/23/11-23-0934-00-0uhr-uhr-sg-june-2023-teleconference-agendas.docx)0
  + Discussion:
    - C: 799r0 and 798r0 have not been uploaded
    - A: Put at the end of the agenda
    - C: My contribution is missing in the queue. Like to add my contribution in the queue.
    - A: I added it back.
    - C: Thank you
    - Agenda approved with unanimous consent.
* Announcements:
  + None
* Submissions
  + [11-23/0284r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0284-00-0uhr-beacon-design.pptx) Beacon design Liwen Chu (NXP)
    - C: I do have quite a few concerns. For hospital, devices seldom change. 11g devices in medical are still common. We just need to transmit anything. Slide 11, I am not sure how it works. HT element, we still use it for low MCS. Even we don’t need HT element, VHT or HT devices which haven’t tested absence, we expect to see some issues. For UHR onwards, we can test those. Have two beacons is the least worth approach.
    - A: As I mentioned, for some hotspot, we don’t expect this method will be used. For some BSS, the AP announces the old generations will not be allowed to associate this AP. The AP can use this method.
    - C: The EHT device expects HT element. How do you see that working?
    - A: Apply to UHR devices.
    - C: it is UHR+?
    - A: yes.
    - C: Beacon design 2, what will be included in beacon and what will be in beacon extension?
    - A: If the beacon is longer enough, the AP will try to separate.
    - C: beacon extension is for new generation, right?
    - A: yes. UHR.
    - C: what does the last sentence mean? Why do we have two these conditions?
    - A: because of robust low data and short beacon interval. If this AP has no critical update, the AP does not need to transmit beacon extension.
    - C: this beacon is for both beacon and beacon extension?
    - A: in this case, the AP may decide to not transmit beacon extension.
    - C: but still need to transmit something for synchronization?
    - A: yes
  + [11-23/0697r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0697-00-0uhr-qos-enhancements-for-uhr.pptx) QoS enhancements for UHR Dibakar Das (Intel)
    - C: I would prefer HOL per flow, but not per TID. For per flow, we do not out-of-order delivery. Identiy a flow. We need out of order delivery. SN counter, PN counter something specific to that flow or flows.
    - A: Maybe the same thing, but not sure. Let’s figure it offline.
    - C: You have reliability in mind. I am not convinced this will help reliability. Controversially, this scenario assumes there is loss link. What kind of reliability we have for this link already?

A: The MAC relialibity is not affected. We still retransmit the packet. We are not losing anything.

C: when we borrow something, need to verify…

C: Slide 6, what is the retransmit of the hole?

A: this is the baseline.

* + [11-23/0815r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0815-00-0uhr-consideration-of-industrial-automation-scenarios.pptx) Consideration of Industrial Automation Scenarios Akira Kishida (NTT)
    - C: unlicensed band, we should work as much as possible. The KPIs are pretty challenging.
    - A: we should consider what KPI, the target value are suitable for industrial automation.
    - C: As a group, it is good to think about it.
    - A: thank you.
* **SP: Do you agree that continuing consideration of network topologies for industrial automation in the UHR is helpful?**

-Yes

-No

-Abstain

Results: 50Y, 2N, 37A, 69 No answer

* AoB:
  + None
* Adjourned at 11:17 ET

# 2nd Conf. Call: June 5th Monday (10:00–12:00 ET)

* The Chair, Laurent Cariou (Intel), calls the meeting to order.
* IEEE 802 and 802.11 IPR policy and procedure
  + Patent Policy: Ways to inform IEEE:
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**Copyright Policy was presented.**

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* Attendance reminder.
  + Participation slide: <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180-05-00EC-ieee-802-participation-slide.pptx>
  + Please record your attendance during the conference call by using the IMAT system:
    - 1) login to [imat](https://imat.ieee.org/attendance), 2) select “802.11 Telecons (<Month>)” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “<UHR SG > conference call that you are attending.
  + If you are unable to record your attendance contact Laurent Cariou ([laurent.cariou@intel.com](mailto:laurent.cariou@intel.com)) and Ross Jian Yu ([ross.yujian@huawei.com](mailto:ross.yujian@huawei.com)) for assistance
  + Please ensure that the following information is listed correctly when joining the call:
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* Agenda
  + Chair reviews proposed agenda found in [11-23-0934r](https://mentor.ieee.org/802.11/dcn/23/11-23-0934-01-0uhr-uhr-sg-june-2023-teleconference-agendas.docx)1
  + Discussion:
    - Agenda approved with unanimous consent.
* Announcements:
  + None
* Submissions
  + [11-23/0679r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0679-00-0uhr-low-latency-qos-based-on-l4s.pptx) Low Latency QoS based on L4S Lili Hervieu (CableLabs)
    - C: What you talk is above MAC?
    - A: The only thing would be affected is the MAC management of the ECN field. That would be in the MAC layer. Classify it as the L4S or non-L4S traffic.
    - C: you mention queuing delay does not depend on channel access delay?
    - A: There is delay due to EDCA and delay due to buffer. This is what I call queue delay.
    - C: This is also catergorized to channel access delay, right?
    - A: the line is not clear.
    - C: slide 8, in this slide, you show there are two queues. What is the behavior when the transmitter obtains the Tx opportunity? Which queue will be choosed?
    - A: no prioritization. Will depend on how you handle the queue. It depends on your own implementation.
  + [11-23/0610r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0610-01-0uhr-low-latency-traffic-delivery-in-uhr.pptx) Low latency traffic delivery in UHR Si-Chan Noh(Newracom)
    - C: For low latency and normal traffic, are they synchronized?
    - A: Not considered.
    - C: It is concise. Whilst it lacks a lot of details. Usually we do puncture when there exists interference. What would be the effect to the other devices?
    - A: There is a case the STA has a clear channel. Some channels for some STAs could be more efficient when assigned to low latency traffic.
    - C: You want DL and UL mixed together or DL DL, UL UL?
    - A: we assume it is UL UL.
    - C: the AP needs to detect?
    - A: before triggering, the AP needs to decide how to assign the channels.
    - C: why not just assign?
    - A: the puncturing information is not indicated in trigger?
    - C: why not directly indicate or use UORA?
    - A: the STA from OBSS cannot use that channel. The AP assign the channel to other STAs. The STA can use that channels.
    - C: as previuos commenter mentions, you may abuse some concept of preamble puncturing.
    - C: I think the previous commenter has asked a good question. Can you go to slide 4, we have multiple STAs have low traffic? How do they access the punctured channel?
    - A: in that case, out of the scope of this scheme. Need to discuss that separately.
  + [11-23/0312r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0312-00-0uhr-thoughts-on-secure-control-frames.pptx) Thoughts on Secure Control frames Alfred Asterjadhi (Qualcomm Inc.)
    - C: Regarding the motivation, for reliability and security, but does this add latency or delay?
    - A: In ideal case, no. When you refer to the extra padding, I guess the extra padding is 10us or 100s of us. The extra security, if you think don’t care which I do, you can turn it off.
    - C: MIC and PN of the trigger frame? Why don’t you encrypt the common info and user info?
    - A: that is an interesting thought. We target to increase reliability. Whether we need to encrypt it or not is an open question. Trying to see what is the goal from reliability point of view.
  + [11-23/0352r1](https://mentor.ieee.org/802.11/dcn/23/11-23-0352-01-0uhr-enhanced-security-discussion.pptx) enhanced security discussion Liwen Chu (NXP)
    - C: In the previous presentation, the author focuses on trigger frame. In your scheme, is that a specific control frame you focus?
    - A: Because we assume currently at least BA issue needs to be protected. At least for BA and trigger. For other frames, we can further discuss.
    - C: Simliar as the previous presenter, yes?
    - A: yes.
    - C: slide 3, you mention under MLO, CGTK should be per link?
    - A: for each transition key, PN related to that key, this PN will be applied to a single frame. Let’s say control transient key in two links, it is difficult to give PN under the same key if they use the same key for control frames in multiple links.
    - C: is there any distinction between the data and control frames?
    - A: data and control frames should be separated.
    - C: you use different keys?
    - A: Yes.
    - C: slide 6, you talk some devices needs padding? We can choose in hardware that doesn’t need padding. Wants to reduce ovheread. What level of padding do you assume?
    - A: currently not sure. Try to avoid padding. We cannot assume all the devices do not need padding. The additional encryption of the frame and descryption of the responding frame.
    - C: do you have a sense? xx us or 1ms?
    - A: it is up to the group to decide. But I think it is needed. Agree should keep it less if possible.
    - C: We are in a SG. We should narrow down the details. You suspect there may be legacy, they may not process successfully?
    - A: this is not the main reason. The reason is that if you look at baseline, each generation 11ax, 11be, we have this PPDU format selection. For trigger frame, explicty say it can be transmitted in non-HT PPDU. For other frames, it has restrictions on when can be carried in non-HT and non-HT duplicate PPDU. MU-BAR and M-BA will be carried in non-HT PPDU. We cannot use trigger frame method to have this padding field, per STA info to add. We need to use MPDU delimiter, in that sense, we need to change the PPDU format selection rule.
    - C: you are saying if the BA, CBA or the BAR is not transmitted in non-HT, we need to change the PPDU format selection rule.
    - A: yes.
    - C: slide 4, for Opt1, do you assume to protect all the fields or a particular field?
    - A: the whole frame.
  + [11-23/0356r1](https://mentor.ieee.org/802.11/dcn/23/11-23-0356-01-0uhr-mac-header-protection.pptx) MAC Header Protection Abhishek Patil (Qualcomm)
    - No Q&A
* AoB:
  + None
* Adjourned at 11:48 ET

# 3rd Conf. Call: June 12th Monday (10:00–12:00 ET)

# 4th Conf. Call: June 19th Monday (10:00–12:00 ET)

# 5th Conf. Call: June 26th Monday (10:00–12:00 ET)

# Appendix

* + Attendee List for 1st Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| UHR SG | 6/1 | AbidRabbu, Shaima' | Istanbul Medipol University; Vestel |
| UHR SG | 6/1 | Aio, Kosuke | Sony Corporation |
| UHR SG | 6/1 | Asai, Yusuke | NTT |
| UHR SG | 6/1 | Baek, SunHee | LG ELECTRONICS |
| UHR SG | 6/1 | Baykas, Tuncer | Ofinno |
| UHR SG | 6/1 | Bredewoud, Albert | Broadcom Corporation |
| UHR SG | 6/1 | Chen, You-Wei | MediaTek Inc. |
| UHR SG | 6/1 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| UHR SG | 6/1 | Chiang, James | MediaTek Inc. |
| UHR SG | 6/1 | Chng, Baw | BAWMAN LLC |
| UHR SG | 6/1 | CHUN, JINYOUNG | LG ELECTRONICS |
| UHR SG | 6/1 | Chung, Chulho | SAMSUNG |
| UHR SG | 6/1 | da Silva, Claudio | Meta Platforms Inc. |
| UHR SG | 6/1 | Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| UHR SG | 6/1 | Eren, Tuncay | Istanbul Medipol University, Vestel |
| UHR SG | 6/1 | Erkucuk, Serhat | Ofinno |
| UHR SG | 6/1 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| UHR SG | 6/1 | Fang, Yonggang | MediaTek Inc. |
| UHR SG | 6/1 | Fujimori, Yuki | Canon Research Centre France |
| UHR SG | 6/1 | Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 6/1 | GUIGNARD, Romain | Canon Research Centre France |
| UHR SG | 6/1 | Gupta, Binita | Meta Platforms, Inc. |
| UHR SG | 6/1 | Handte, Thomas | Sony Group Corporation |
| UHR SG | 6/1 | Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) |
| UHR SG | 6/1 | Ho, Duncan | Qualcomm Incorporated |
| UHR SG | 6/1 | Hsu, Ostrovsky | Xiaomi Communications Co., Ltd. |
| UHR SG | 6/1 | HUANG, CHIHAN | MediaTek Inc. |
| UHR SG | 6/1 | Huang, Po-Kai | Intel |
| UHR SG | 6/1 | Huq, Kazi Mohammed Saidul | NO AFFILIATION |
| UHR SG | 6/1 | Jang, Insun | LG ELECTRONICS |
| UHR SG | 6/1 | Jen, Elliot YuChih | Samsung Research America |
| UHR SG | 6/1 | Kim, Jeongki | Ofinno |
| UHR SG | 6/1 | Kim, Sang Gook | LG ELECTRONICS |
| UHR SG | 6/1 | Kim, Sanghyun | WILUS Inc. |
| UHR SG | 6/1 | Kim, Youhan | Qualcomm Technologies, Inc. |
| UHR SG | 6/1 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| UHR SG | 6/1 | Klein, Arik | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Koundourakis, Michail | Samsung Cambridge Solution Center |
| UHR SG | 6/1 | Kuo, Chih-Chun | MediaTek Inc. |
| UHR SG | 6/1 | Lalam, Massinissa | SAGEMCOM SAS |
| UHR SG | 6/1 | Lee, Wookbong | Apple Inc. |
| UHR SG | 6/1 | Levy, Joseph | InterDigital, Inc. |
| UHR SG | 6/1 | Li, Weiyi | Spreadtrum |
| UHR SG | 6/1 | Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 6/1 | Li, Ying | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Lim, Dong Guk | LG ELECTRONICS |
| UHR SG | 6/1 | Lin, Zinan | InterDigital, Inc. |
| UHR SG | 6/1 | Lou, Hanqing | InterDigital, Inc. |
| UHR SG | 6/1 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 6/1 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| UHR SG | 6/1 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| UHR SG | 6/1 | Ma, Yunsi | HiSilicon (Shanghai) Technologies Co., LTD. |
| UHR SG | 6/1 | Maguluri, Anilkumar | Synaptics |
| UHR SG | 6/1 | McCann, Stephen | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Minotani, Jun | Panasonic Corporation |
| UHR SG | 6/1 | Miwa, Shinya | Canon Research Centre France |
| UHR SG | 6/1 | Montemurro, Michael | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Mutgan, Okan | Nokia |
| UHR SG | 6/1 | Nayak, Peshal | Samsung Research America |
| UHR SG | 6/1 | Nezou, Patrice | Canon Research Centre France |
| UHR SG | 6/1 | Noh, Si-Chan | Newracom Inc. |
| UHR SG | 6/1 | Park, Minyoung | Intel |
| UHR SG | 6/1 | Park, Sungjin | Senscomm |
| UHR SG | 6/1 | Patwardhan, Gaurav | Hewlett Packard Enterprise |
| UHR SG | 6/1 | Petrick, Albert | InterDigital, Inc. |
| UHR SG | 6/1 | Pettersson, Charlie | Ericsson AB |
| UHR SG | 6/1 | Ptasinski, Henry | Element78 Communications LLC |
| UHR SG | 6/1 | Qi, Yue | Samsung Research America |
| UHR SG | 6/1 | Quan, Yingqiao | Spreadtrum |
| UHR SG | 6/1 | Ratnam, Vishnu | Samsung Research America |
| UHR SG | 6/1 | Redlich, Oded | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Schelstraete, Sigurd | MaxLinear |
| UHR SG | 6/1 | Shen, Andy | Futurewei Technologies |
| UHR SG | 6/1 | Shilo, Shimi | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Sosack, Robert | Molex Incorporated |
| UHR SG | 6/1 | Stanley, Dorothy | Hewlett Packard Enterprise |
| UHR SG | 6/1 | Strobel, Rainer | MaxLinear |
| UHR SG | 6/1 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Taori, Rakesh | Infineon Technologies |
| UHR SG | 6/1 | Tsujimaru, Yuki | Canon Inc. |
| UHR SG | 6/1 | Val, Inaki | MaxLinear, Inc. |
| UHR SG | 6/1 | Verenzuela, Daniel | Sony Corporation |
| UHR SG | 6/1 | Wang, Lei | Futurewei Technologies |
| UHR SG | 6/1 | Wei, Dong | NXP Semiconductors |
| UHR SG | 6/1 | Wullert, John | Peraton Labs |
| UHR SG | 6/1 | Xin, Yan | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Yamada, Ryota | SHARP CORPORATION |
| UHR SG | 6/1 | Yang, Jimmy | Moxa Inc. |
| UHR SG | 6/1 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 6/1 | Yi, Yongjiang | Spreadtrum Communication USA, Inc |
| UHR SG | 6/1 | Yoon, Yelin | LG ELECTRONICS |
| UHR SG | 6/1 | Yu, Jian | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Zhang, Jiayi | Ofinno |
| UHR SG | 6/1 | Zhao, Yue | Huawei Technologies Co., Ltd |
| UHR SG | 6/1 | Zhou, Pei | TCL |

* + Attendee List for 2nd Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| UHR SG | 6/5 | Aio, Kosuke | Sony Corporation |
| UHR SG | 6/5 | Ajami, Abdel Karim | Qualcomm Technologies, Inc |
| UHR SG | 6/5 | Alayedi, Mohanad | Istanbul Medipol University, Vestel |
| UHR SG | 6/5 | Aldana, Carlos | Facebook |
| UHR SG | 6/5 | Anwyl, Gary | MediaTek Inc. |
| UHR SG | 6/5 | Asai, Yusuke | NTT |
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| UHR SG | 6/5 | CHUN, JINYOUNG | LG ELECTRONICS |
| UHR SG | 6/5 | DeLaOlivaDelgado, Antonio | InterDigital, Inc. |
| UHR SG | 6/5 | Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| UHR SG | 6/5 | Erkucuk, Serhat | Ofinno |
| UHR SG | 6/5 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| UHR SG | 6/5 | Fang, Juan | Intel |
| UHR SG | 6/5 | Fang, Yonggang | MediaTek Inc. |
| UHR SG | 6/5 | Gidvani, Ravi | SAMSUNG ELECTRONICS |
| UHR SG | 6/5 | Gu, Xiangxin | Unisoc |
| UHR SG | 6/5 | GUIGNARD, Romain | Canon Research Centre France |
| UHR SG | 6/5 | Gupta, Binita | Meta Platforms, Inc. |
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| UHR SG | 6/5 | Huang, Po-Kai | Intel |
| UHR SG | 6/5 | Iwai, Takashi | Panasonic Corporation |
| UHR SG | 6/5 | Jang, Insun | LG ELECTRONICS |
| UHR SG | 6/5 | Jen, Elliot YuChih | Samsung Research America |
| UHR SG | 6/5 | Jung, Insik | LG ELECTRONICS |
| UHR SG | 6/5 | Kim, Geon Hwan | LG ELECTRONICS |
| UHR SG | 6/5 | Kim, Sanghyun | WILUS Inc. |
| UHR SG | 6/5 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| UHR SG | 6/5 | Klein, Arik | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Lanante, Leonardo | Ofinno |
| UHR SG | 6/5 | Lee, Wookbong | Apple Inc. |
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| UHR SG | 6/5 | Li, Ying | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Lim, Dong Guk | LG ELECTRONICS |
| UHR SG | 6/5 | Lin, Zinan | InterDigital, Inc. |
| UHR SG | 6/5 | Lou, Hanqing | InterDigital, Inc. |
| UHR SG | 6/5 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 6/5 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| UHR SG | 6/5 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| UHR SG | 6/5 | Ma, Yunsi | HiSilicon (Shanghai) Technologies Co., LTD. |
| UHR SG | 6/5 | Maguluri, Anilkumar | Synaptics |
| UHR SG | 6/5 | Minotani, Jun | Panasonic Corporation |
| UHR SG | 6/5 | Monajemi, Pooya | Apple Inc. |
| UHR SG | 6/5 | Mutgan, Okan | Nokia |
| UHR SG | 6/5 | Nayak, Peshal | Samsung Research America |
| UHR SG | 6/5 | Noh, Si-Chan | Newracom Inc. |
| UHR SG | 6/5 | Ouchi, Masatomo | Canon |
| UHR SG | 6/5 | Park, Sungjin | Senscomm |
| UHR SG | 6/5 | Patil, Abhishek | Qualcomm Incorporated |
| UHR SG | 6/5 | Patwardhan, Gaurav | Hewlett Packard Enterprise |
| UHR SG | 6/5 | Petrick, Albert | InterDigital, Inc. |
| UHR SG | 6/5 | Pettersson, Charlie | Ericsson AB |
| UHR SG | 6/5 | Ptasinski, Henry | Element78 Communications LLC |
| UHR SG | 6/5 | Qi, Yue | Samsung Research America |
| UHR SG | 6/5 | Quan, Yingqiao | Spreadtrum |
| UHR SG | 6/5 | Ryu, Kiseon | NXP Semiconductors |
| UHR SG | 6/5 | Sato, Takuhiro | SHARP CORPORATION |
| UHR SG | 6/5 | Schelstraete, Sigurd | MaxLinear |
| UHR SG | 6/5 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 6/5 | Sevin, Julien | Canon Research Centre France |
| UHR SG | 6/5 | Shen, Andy | Futurewei Technologies |
| UHR SG | 6/5 | Shilo, Shimi | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Smith, Luther | Cable Television Laboratories Inc. (CableLabs) |
| UHR SG | 6/5 | Song, Hao | Intel |
| UHR SG | 6/5 | Sosack, Robert | Molex Incorporated |
| UHR SG | 6/5 | Strobel, Rainer | MaxLinear |
| UHR SG | 6/5 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Sun, Bo | Sanechips |
| UHR SG | 6/5 | Tsodik, Genadiy | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Urabe, Yoshio | Panasonic Holdings Corporation |
| UHR SG | 6/5 | Val, Inaki | MaxLinear, Inc. |
| UHR SG | 6/5 | Verenzuela, Daniel | Sony Corporation |
| UHR SG | 6/5 | VIGER, Pascal | Canon Research Centre France |
| UHR SG | 6/5 | Wang, Hao | Tencent |
| UHR SG | 6/5 | Wang, Qi | Apple, Inc. |
| UHR SG | 6/5 | Wang, Xiaofei | InterDigital, Inc. |
| UHR SG | 6/5 | Wu, Tianyu | Apple, Inc. |
| UHR SG | 6/5 | YANG, RUI | InterDigital, Inc. |
| UHR SG | 6/5 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 6/5 | Yee, James | MediaTek Inc. |
| UHR SG | 6/5 | Yi, Yongjiang | Spreadtrum Communication USA, Inc |
| UHR SG | 6/5 | Yoon, Yelin | LG ELECTRONICS |
| UHR SG | 6/5 | Yu, Jian | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Zhang, Jiayi | Ofinno |
| UHR SG | 6/5 | Zhang, Yan | Apple Inc |
| UHR SG | 6/5 | Zhao, Yue | Huawei Technologies Co., Ltd |
| UHR SG | 6/5 | Zhou, Pei | TCL |

* + Attendee List for 3rd Conf. Call:
  + Attendee List for 4th Conf. Call:
  + Attendee List for 5th Conf. Call: