IEEE P802.11  
Wireless LANs

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| UHR SG July August 2023 teleconference minutes | | | | |
| Date: 2023-07-24 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Ross Jian Yu | Huawei | Building F3, Huawei Industrial Base, Shenzhen, Guangdong, China |  | ross.yujian@huawei.com |
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|  |  |  |  |  |

Abstract

This document contains the minutes for UHR SG July August 2023 teleconference.

Revision history:

* Rev0: initial version.
* Rev1: minutes added for the 2nd call
* Rev2: minutes added for the 3rd call

Abbreviations:

* A: Answer
* C: Comment

# 1st Conf. Call: July 24th 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:

* + - 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**.

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**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>

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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 [11-23-1311r](https://mentor.ieee.org/802.11/dcn/23/11-23-1311-00-0uhr-uhr-sg-july-august-2023-teleconference-agendas.docx)0

Discussion:

* + - C: would like to present r1.
  + Agenda approved with unanimous consent.
* Announcements:

None

* Submissions
  + [11-23/1138r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1138-01-0uhr-features-to-consider-for-efficient-relay-operation.pptx) Features to consider for efficient Relay operation Dongguk Lim (LG Electronics)
    - C: Slide 7, in this figure, CSI is useful for relay STA instead of AP. Why this feedback is sent to AP?
    - A: My assumption is that non-AP associates to AP. All the control is done by the AP.
    - C: In what kind of operation does the AP need the feedback?
    - A: Regarding the feedback info, we can consider CSI or other info. The AP can decide transmit parameter, MCS, RU or bandwidth etc., which is applied to the relay link.
    - C: we can further discuss offline.
    - C: slide 5, the trigger to the non-AP STA is also coming from the AP?
    - A: yes.
    - C: the association of the non-AP is to the AP?
    - A: yes. Relay STA doesn’t have any AP funcation.
    - C: The AID assignment is with respect to the AP?
    - A: in my assumption, relay STA is a non-AP STA, associated to the AP.
    - C: Relay STA is a non-AP STA, later on, when the relay STA wants to servce the non-AP STA. Does it need some AP function?
    - C: we can do offline discussion.
    - C: slide 6, relay STA may use MIMO or BF to STA 1 or STA n?
    - A: yes. We can consider BF or MIMO for the relay link. Need more discussion.
    - C: my concern is that the relay STA, as a non-AP STA, may not have BFer capability. We can discuss more what capability does the relay STA need to have.
    - C: Do you consider channel information in your relay selection? Or do you treat them independently?
    - A: Relay STA is located near the AP. I assume relay STA has good channel condition. The channel between AP and relay STA is good. That’s my assumption. We should consider relay STA is near the AP, it has the good condition.
    - C: you are considerting RSSI as a measurement whether the STA 1 and 2 is close to the relay or far from the relay. Is it true?
    - A: The procedure in slide 5, the non-AP STA transmits UL PPDU, the relay STA measures the RSSI based on measuring the UL PPDU. One way is to use RSSI as an example. We can consider more metrics and need more discussion.
    - C: RSSI measurement is not enough. The AP will get the RSSI from the STA and relay together?
    - A: yes.
    - C: we can continue discussion.
  + [11-23/1139r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1139-00-0uhr-relay-transmission-in-uhr.pptx) Relay transmission in UHR Dongguk Lim (LG Electronics)
    - C: slide 9, for UL Relay transmission, how can you guarantee non-AP STA can receive trigger from the AP?
    - A: The non-AP STA is an associated STA, it can receive some signaling from the AP. AP can exchange frames with non-AP STA, which is located at the boundary.
    - C: You are assuming the AP can reach the non-AP STA. But cannot receive directly from STA1?
    - A: Even STA can receive from AP. By relay operation, we can apply high MCS.
    - C: it is a tradeoff. Either use low MCS to receive from AP directly or from the relay, use higher MCS but longer time.
    - C: slide 8, why does AP need to get Ack3?
    - A: I assume all the control for relay operation is done by the AP. The relay cannot do retransmission directly. Based on the ACK from the end user, the AP can decide retransmission.
    - C: does AP need to get Ack1?
    - A: regarding Ack1,2,3, we need more discussion. We can further optimize the procedure. To guarantee the successful of PPDU1, we can have Ack1.
  + [11-23/1146r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1146-01-0uhr-relaying-for-low-latency-traffic-in-uhr.pptx) Relaying for Low Latency Traffic in UHR Serhat Erkucuk (Ofinno)
    - C: I agree with you when the relay and STA have ML, it will help reduce latency. There are challenges to select the link and timing to forward the relay data. But all of these are implementation choice. I want to ask what should we do in the standard. Maybe I miss something.
    - A: Opt 2, we need to define how do we determine the receiver and destination address.
    - C: The receiver address is the STA’s MAC address, and the destination address is the MLD address. Seems to me, it is quite clear. I don’t see an issue here.
    - A: There may be some different addressing issues.
  + [11-23/1090r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1090-00-0uhr-seamless-roaming-follow-up.pptx) Seamless Roaming Follow-up Yelin Yoon (LG Electronics)
    - C: slide 8, confused about the 2nd bullet. It says AP1 and AP4 are co-located. Whether APs are co-located is if they are in the same device. It seems AP1 and AP4 are not in the same device.
    - A: In this case, we are considering all AP MLD are co-located. Consider the logic connection. Even they are physically separated. We also take this into consideration of co-located. It is a little bit different concept from what have talked about.
    - C: we can have more offline discussion.
    - C: slide 8, synchronization, how can you know if the existing mechanisms can still hold?
    - A: I think we need to see the requirement of MLDs. Find out if work out or not. The co-location can be used for AP MLD identification.
    - C: You have a specific order, AP1 is changing to AP2, is this an example? What would be the order? Which link is the first line to change?
    - A: It is just an example. STA1 can do roaming first, or STA2, or at the same time. It depends on how they build the device.
    - C: how does STA1 make sure AP4 is available at that time?
    - A: since AP1 and AP4 are within the same AP MLD. It will transfer the data between them. AP MLD1 will know and notify the STA.
    - C: slide 5, where is the UMAC located? Same device? Or a separate device?
    - A: We are only considering the logic aspect. We haven’t got into the physical part. This is something needs to be discussed as well.
    - C: slide 8, AP MLD 1 and AP MLD 2 are located within the same physical device?
    - A: yes. They are close to each other basically.
    - C: Compared with non-co-located AP MLD. What is the gap?
    - A: the other presentations, they have a bit different meaning towards co-location. In our case, we are using co-location as the methods which devices are physically located.
    - C: My question and a lot of prevous questions, you can have upper MAC, all the lower MACs in each AP MLD. What you have here, could still use that architecture.
    - A: this is one of the options.
  + [11-23/1131r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1131-00-0uhr-thoughts-on-seamless-roaming.pptx) Thoughts on seamless roaming Ryuichi Hirata (Sony Corporation)
    - No Q&A
  + [11-23/0665r1](https://mentor.ieee.org/802.11/dcn/23/11-23-0665-01-0uhr-resource-management-for-multi-ap-coordination.pptx) Resource Management for Multi-AP Coordination Peshal Nayak (Samsung)
    - No Q&A
* AoB:

None

* Adjourned at 11:52 ET

# 2nd Conf. Call: August 7th 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

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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>

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* Agenda

Chair reviews proposed agenda found in [11-23-1311r](https://mentor.ieee.org/802.11/dcn/23/11-23-1311-01-0uhr-uhr-sg-july-august-2023-teleconference-agendas.docx)1

Discussion:

* + - Agenda approved with unanimous consent.
* Announcements:

None

* Submissions
  + [11-23/0668r2](https://mentor.ieee.org/802.11/dcn/23/11-23-0668-02-0uhr-coordinated-measurement.pptx) Coordinated Measurement Kosuke Aio (Sony Corporation)
    - C: agree OBSS channel measurement is needed. Slide 9, I wonder the gap, between explicit and implicit, is large when the number of STA is large. Where does the gap come from?
    - A: The gap arises from NDPA frames, trigger frames.
    - C: The STA transmits RSSI information in OFDMA manner. Many STAs can transmit their information in one time.
    - A: In these evaluations, all the STAs can transmit in OFDMA. But the gap comes from NDPA and BFRP trigger frame. For example, 4 byte per STA in NDPA.
    - C: How about implicit type?
    - A: I use NFRP trigger frame, indicate the number of STAs by the range of AIDs.
    - C: slide 6, in this procedure, AP1, AP2, AP3 are operatig in the same channel?
    - A: yes.
    - C: for seamless roaming, neighboring APs are usually operating in different channels. How to do channel measurement if they are operating in different channels?
    - A: I see your point. It depends on use case and scenario. It may be OK that all APs set different primary channels to avoid conflicit. When AP1 transmits using higher bandwidth such as 160 MHz or more than that. AP1, AP2, AP3 will have overlapping channels. Coordinated measurement will be necessary. Seamless roaming will be useful using higher bandwidth in these scenarios.
    - C: we can have more offline discussion.
  + [11-23/1066r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1066-00-0uhr-m-ap-coordination-agreement-follow-up.pptx) M-AP Coordination Agreement - follow up Arik Klein (Huawei)
    - No Q&A
  + [~~11-23/1193r1~~](https://mentor.ieee.org/802.11/dcn/23/11-23-1193-01-0uhr-nulling-performance-of-coordinated-beamforming.pptx) ~~Nulling Performance of Coordinated Beamforming Xin Li and Yanchun Li (Huawei)~~ 
    - Deferred by the author.
  + [11-23/1085r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1085-00-0uhr-thoughts-on-coordinated-tdma.pptx) Thoughts on Coordinated TDMA Geonhwan Kim (LG Electronics)
    - C: I agree with the problem. For the potential solution, the MU-RTS TXS TF can trigger the shared AP to send CTS-to-self frames. Then I don’t see any problems.
    - A: MU-RTS TXS TF is transmited to shared AP, the non-AP STA associated with the shared AP will set basic NAV.
    - C: MU-RTS TXS TF, if we allow a single AP can be allocated, then MU-RTS TXS TF can only include a single AP address.
    - A: CTS frame issue is the CTS frame only has RA. Shared AP sends CTS, then it includes sharing AP’s MAC address.
    - C: we are pretty much aligned to use existing TXS frame as much as possible. Slide 5, 2nd bullet, AP will negotiate operating channel and banwdith, how are they negotiated?
    - A: This negotiation can be done before the C-TDMA procedure.
    - C: we can do further offline discussion.
  + [11-23/0860r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0860-00-0uhr-further-thoughts-on-coordinated-twt.pptx) Further thoughts on coordinated TWT Rubayet Shafin (Samsung Research America)
    - C: For AP to AP communication, you mention the AP can monitor other AP’s beacon information.
    - A: I just highlight all the options, monitoring AP’s beacon may not be the preferred option. We can talk about the details later.
    - C: We need some mechanism to enable AP to AP communication.
    - C: Slide 5, in the figure, you assume the communication is possible between the shared AP and sharing AP. If AP2 and AP4 are adjacent. Does AP4 respect AP2’s TWT schedule?
    - A: AP2 and AP4 once they hear the announcement from AP1, then AP1, AP2, AP4 can perform C-TWT. If AP4 need to respect AP2’s TWT, need separate negotiation. My intention is AP2 and AP4 just follow AP1’s schedule.
    - C: You seem to also want to cover individual TWT.
    - A: We are trying to have a kind of common framework, which can be used by R-TWT, B-TWT, and I-TWT. If one STA suffers interference, the AP can form a null for that particular STA in that I-TWT. Lower transmission power, SR, or no transmission during that time. The general goal, is to not restrict ourself to R-TWT, B-TWT.
  + [11-23/0226r](https://mentor.ieee.org/802.11/dcn/23/11-23-0226-02-0uhr-coordination-of-r-twt-for-multi-ap-deployment.pptx)2 Coordination of R-TWT for Multi-AP Deployment Abdel Karim Ajami (Qualcomm Inc.)
    - C: Do you envision that coordinated EDCA parameters will be also applied to the associated STAs?
    - A: That’s a good question. Usually the client has other EDCA parameters. For the APs, what type of EDCA they are using. It’s mainly targeting between the APs.
  + [11-23/1087r](https://mentor.ieee.org/802.11/dcn/23/11-23-1087-00-0uhr-announcement-for-r-twt-coordination.pptx)0 Announcement for R-TWT Coordination SunHee Baek (LG Electronics)
    - No Q&A
* AoB:

None

* Adjourned at 11:43 ET

# 3rd Conf. Call: August 14th 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>

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Chair reviews proposed agenda found in [11-23-1311r](https://mentor.ieee.org/802.11/dcn/23/11-23-1311-01-0uhr-uhr-sg-july-august-2023-teleconference-agendas.docx)1

Discussion:

* + - C: would like to present 11-23/1242r1.
    - C: request to defer 11-23/1173r0.
    - Agenda approved with unanimous consent.
* Announcements:

None

* Submissions
  + [11-23/1174r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1174-00-0uhr-txop-preemption-follow-up.pptx) TXOP preemption follow up Kiseon Ryu (NXP)
    - C: slide 6, in this figure, STA2 sends Low lantency indication (LLI) after SIFS. There may be more than one STAs. How does the AP know who is sending LLI?
    - A: It is a good question. Here is just an example. Instead of BSRP TF, the AP can send NFRP trigger frame. Also can have some pre-negotiation beforehand. The AP can figure out which STA can send LLI in advance. Or can use UORA procedure.
    - C: There are several options. Use NFRP for many STAs, or use UORA, or use negotiation. How to do negotiation?
    - A: Several STAs can use for example R-TWT to negotiate. The AP can send trigger to STAs that have already donge negotiation.
    - C: Slide 6, the first two DL PPDUs with yellow color, you have the preemption allowance indication. Do you assume all the STAs have capability to understand the indication?
    - A: UHR STAs have the capability to understand.
    - C: what if some STAs are not UHR STAs.
    - A: non-UHR STAs cannot do preemption.
    - C: you have the PIFS between PPDUs.
  + [11-23/1229r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1229-01-0uhr-preemption-for-low-latency-application-follow-up.pptx) Preemption for low latency application (Follow up) Juan Fang (Intel)
    - C: slide 8, for multiple STAs that have low latency traffic together. My question is that some STAs may not arrive after the registration. For the periodic I agree. For the basic case, how does the STA know low latency would come?
    - A: We may have random channel access.
    - C: Slide 6, for the broken line, the PR could send by the AP?
    - A: Preemption means showing up, will be sent by the STA side.
    - C: The AP transmits multiple PPDUs without soliciting responding frames.
    - A: You mean there are no immediate BA?
    - C: not just BA. You cannot transmit multiple PPDUs without BA negotiation.
    - A: For each DL PPDU, need to indicate whether there should be an immediate BA.
    - C: slide 8, STA2 and STA3 are UHR STAs. They simultaneous transmit PR, how can they do that?
    - A: Upon preceding DL PPDU, after SIFS, they will simultaneously transmit preamble.
    - C: AP determine that it is STA2 and STA3 who send PR?
    - A: AP could not know, just know someone raises the hands. Don’t know who raises the hand. Need the NFRP to know who raises the hand.
    - C: You mention there are some power save restriction.
    - A: we don’t want the STA keeping wake up during the whole TXOP. Still support intra PPDU power save. After the detection of the preemption, could go to sleep mode. That’s what I mean.
    - C: if the preemption is not set until the last PPDU. The STA has to wake up.
    - A: after the first RTS\*, the STA could know if preemption is allowed or not. If preemption is not allowed, the STA could go to sleep if the RTS is not for him. If preemption is allowed, if the preemption bit is 1, the STA could go to sleep until the end of PPDU. If the preemption is 0, the STA could also go to sleep and go to detect the second PPDU.
  + [11-23/1194r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1194-00-0uhr-overlapped-indication-to-support-preemption.pptx) Overlapped indication to support preemption Daniel Verenzuela (Sony Group Corporation)
    - C: slide 10, I guess when we get to MCS 8, 12, 13, the degradation gets much larger.
    - A: It also depends on the spread of the signal.
    - C: I am worrying about the reliability.
    - A: The design can further work to achieve such requirement.
    - C: you mention LL traiffic can be sent without CCA? Which regulatory?
    - A: from ETSI.
  + [11-23/1242r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1242-01-0uhr-considerations-on-inter-ppdu-based-preemption-scheme.pptx) Considerations on Inter-PPDU based Preemption Scheme Juseong Moon (KNUT)
    - No Q&A
* AoB:

None

* Adjourned at 11:20 ET

# Appendix

Attendee List for 1st Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| UHR SG | 7/24 | AbidRabbu, Shaima' | Istanbul Medipol University; Vestel |
| UHR SG | 7/24 | Aio, Kosuke | Sony Corporation |
| UHR SG | 7/24 | Ajami, Abdel Karim | Qualcomm Technologies, Inc |
| UHR SG | 7/24 | Anwyl, Gary | MediaTek Inc. |
| UHR SG | 7/24 | Asai, Yusuke | NTT |
| UHR SG | 7/24 | Baek, SunHee | LG ELECTRONICS |
| UHR SG | 7/24 | Baykas, Tuncer | Ofinno |
| UHR SG | 7/24 | Carney, William | Sony Group Corporation |
| UHR SG | 7/24 | Cha, Dongju | LG ELECTRONICS |
| UHR SG | 7/24 | Chen, You-Wei | MediaTek Inc. |
| UHR SG | 7/24 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| UHR SG | 7/24 | Chiang, James | MediaTek Inc. |
| UHR SG | 7/24 | Cho, Hangyu | LG ELECTRONICS |
| UHR SG | 7/24 | Choi, Jinsoo | LG ELECTRONICS |
| UHR SG | 7/24 | Chung, Chulho | SAMSUNG |
| UHR SG | 7/24 | Coffey, John | Realtek Semiconductor Corp. |
| UHR SG | 7/24 | da Silva, Claudio | Meta Platforms Inc. |
| UHR SG | 7/24 | Derham, Thomas | Broadcom Corporation |
| UHR SG | 7/24 | Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| UHR SG | 7/24 | Erkucuk, Serhat | Ofinno |
| UHR SG | 7/24 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| UHR SG | 7/24 | Fang, Juan | Intel |
| UHR SG | 7/24 | Fischer, Matthew | Broadcom Corporation |
| UHR SG | 7/24 | Fujimori, Yuki | Canon Research Centre France |
| UHR SG | 7/24 | Ghosh, Chittabrata | Apple Inc. |
| UHR SG | 7/24 | Gu, Junrong | Clourney Semiconductor |
| UHR SG | 7/24 | Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd.; Unisoc (Shanghai) Technologies Co., Ltd. |
| UHR SG | 7/24 | GUIGNARD, Romain | Canon Research Centre France |
| UHR SG | 7/24 | Gupta, Binita | Meta Platforms, Inc. |
| UHR SG | 7/24 | Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) |
| UHR SG | 7/24 | Hirata, Ryuichi | Sony Group Corporation |
| UHR SG | 7/24 | Hu, Xiaokun | Ruijie Networks Co., Ltd. |
| UHR SG | 7/24 | huang, kaikai | Nokia |
| UHR SG | 7/24 | Huang, Po-Kai | Intel |
| UHR SG | 7/24 | Jeon, Eunsung | SAMSUNG ELECTRONICS |
| UHR SG | 7/24 | jiang, yiming | Nokia |
| UHR SG | 7/24 | Kamel, Mahmoud | InterDigital, Inc. |
| UHR SG | 7/24 | Kim, Geon Hwan | LG ELECTRONICS |
| UHR SG | 7/24 | Kim, Myeong-Jin | SAMSUNG |
| UHR SG | 7/24 | Kim, Sang Gook | LG ELECTRONICS |
| UHR SG | 7/24 | Kim, Sanghyun | WILUS Inc. |
| UHR SG | 7/24 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| UHR SG | 7/24 | Klein, Arik | Huawei Technologies Co., Ltd |
| UHR SG | 7/24 | Klimakov, Andrey | Huawei Technologies Co., Ltd |
| UHR SG | 7/24 | Lanante, Leonardo | Ofinno |
| UHR SG | 7/24 | LEE, JOONSOO | Newracom Inc. |
| UHR SG | 7/24 | Lee, Wookbong | Apple Inc. |
| UHR SG | 7/24 | Li, Weiyi | Spreadtrum Communication USA, Inc |
| UHR SG | 7/24 | Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 7/24 | Lim, Dong Guk | LG ELECTRONICS |
| UHR SG | 7/24 | Lou, Hanqing | InterDigital, Inc. |
| UHR SG | 7/24 | Lu, kaiying | MediaTek Inc. |
| UHR SG | 7/24 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 7/24 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| UHR SG | 7/24 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| UHR SG | 7/24 | Ma, Yunsi | HiSilicon (Shanghai) Technologies Co., LTD. |
| UHR SG | 7/24 | Maguluri, Anilkumar | Synaptics |
| UHR SG | 7/24 | Mantha, Abhishek | Broadcom Corporation |
| UHR SG | 7/24 | McCann, Stephen | Huawei Technologies Co., Ltd |
| UHR SG | 7/24 | Minotani, Jun | Panasonic Corporation |
| UHR SG | 7/24 | Motozuka, Hiroyuki | Panasonic Holdings Corporation |
| UHR SG | 7/24 | Naik, Gaurang | Qualcomm Technologies, Inc |
| UHR SG | 7/24 | Namvar, Nima | Charter Communications |
| UHR SG | 7/24 | Nayak, Peshal | Samsung Research America |
| UHR SG | 7/24 | Noh, Si-Chan | Newracom Inc. |
| UHR SG | 7/24 | Ozbakis, Basak | VESTEL Electronics Corp. |
| UHR SG | 7/24 | Park, Minyoung | Intel |
| UHR SG | 7/24 | Patil, Abhishek | Qualcomm Incorporated |
| UHR SG | 7/24 | Patwardhan, Gaurav | Hewlett Packard Enterprise |
| UHR SG | 7/24 | Petrick, Albert | InterDigital, Inc. |
| UHR SG | 7/24 | Qi, Yue | Samsung Research America |
| UHR SG | 7/24 | Quan, Yingqiao | Spreadtrum |
| UHR SG | 7/24 | Rafique, Saira | Istanbul Medipol University, Vestel |
| UHR SG | 7/24 | Ratnam, Vishnu | Samsung Research America |
| UHR SG | 7/24 | RISON, Mark | Samsung Cambridge Solution Centre |
| UHR SG | 7/24 | Ryu, Kiseon | NXP Semiconductors |
| UHR SG | 7/24 | Sahoo, Anirudha | National Institute of Standards and Technology |
| UHR SG | 7/24 | Schelstraete, Sigurd | MaxLinear |
| UHR SG | 7/24 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 7/24 | Shafin, Rubayet | Samsung Research America |
| UHR SG | 7/24 | Shen, Andy | Futurewei Technologies |
| UHR SG | 7/24 | Shilo, Shimi | Huawei Technologies Co., Ltd |
| UHR SG | 7/24 | Shirakawa, Atsushi | SHARP CORPORATION |
| UHR SG | 7/24 | Smith, Luther | Cable Television Laboratories Inc. (CableLabs) |
| UHR SG | 7/24 | Son, Ju-Hyung | WILUS Inc. |
| UHR SG | 7/24 | Song, Hao | Intel |
| UHR SG | 7/24 | Sosack, Robert | Molex Incorporated |
| UHR SG | 7/24 | Strobel, Rainer | MaxLinear |
| UHR SG | 7/24 | Sun, Bo | Sanechips |
| UHR SG | 7/24 | Taori, Rakesh | Infineon Technologies |
| UHR SG | 7/24 | Tsujimaru, Yuki | Canon Inc. |
| UHR SG | 7/24 | Val, Inaki | MaxLinear, Inc. |
| UHR SG | 7/24 | VIGER, Pascal | Canon Research Centre France |
| UHR SG | 7/24 | Wang, Lei | Futurewei Technologies |
| UHR SG | 7/24 | Wei, Dong | NXP Semiconductors |
| UHR SG | 7/24 | Wullert, John | Peraton Labs |
| UHR SG | 7/24 | Yang, Jay | Nokia |
| UHR SG | 7/24 | Yang, Jimmy | Moxa Inc. |
| UHR SG | 7/24 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 7/24 | Yee, James | MediaTek Inc. |
| UHR SG | 7/24 | Yi, Yongjiang | Spreadtrum Communication USA, Inc |
| UHR SG | 7/24 | Yoon, Yelin | LG ELECTRONICS |
| UHR SG | 7/24 | Zhang, Jiayi | Ofinno |
| UHR SG | 7/24 | Zhang, Yan | Apple Inc |
| UHR SG | 7/24 | Zhao, Yue | Huawei Technologies Co., Ltd |
| UHR SG | 7/24 | Zhou, Lei | H3C Technologies Co., Limited |

Attendee List for 2nd Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| UHR SG | 8/7 | Aio, Kosuke | Sony Corporation |
| UHR SG | 8/7 | Ajami, Abdel Karim | Qualcomm Technologies, Inc |
| UHR SG | 8/7 | Anwyl, Gary | MediaTek Inc. |
| UHR SG | 8/7 | Asterjadhi, Alfred | Qualcomm Technologies, Inc |
| UHR SG | 8/7 | Baek, SunHee | LG ELECTRONICS |
| UHR SG | 8/7 | Cao, Rui | NXP Semiconductors |
| UHR SG | 8/7 | Carney, William | Sony Group Corporation |
| UHR SG | 8/7 | Cha, Dongju | LG ELECTRONICS |
| UHR SG | 8/7 | Chen, Shuqiao | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| UHR SG | 8/7 | Chiang, James | MediaTek Inc. |
| UHR SG | 8/7 | Cho, Hangyu | LG ELECTRONICS |
| UHR SG | 8/7 | Choi, Jinsoo | LG ELECTRONICS |
| UHR SG | 8/7 | Chu, Liwen | NXP Semiconductors |
| UHR SG | 8/7 | CHUN, JINYOUNG | LG ELECTRONICS |
| UHR SG | 8/7 | Chung, Chulho | SAMSUNG |
| UHR SG | 8/7 | Coffey, John | Realtek Semiconductor Corp. |
| UHR SG | 8/7 | da Silva, Claudio | Meta Platforms Inc. |
| UHR SG | 8/7 | Derham, Thomas | Broadcom Corporation |
| UHR SG | 8/7 | Erkucuk, Serhat | Ofinno |
| UHR SG | 8/7 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| UHR SG | 8/7 | Fang, Juan | Intel |
| UHR SG | 8/7 | Fang, Yonggang | MediaTek Inc. |
| UHR SG | 8/7 | feng, Shuling | MediaTek Inc. |
| UHR SG | 8/7 | Fischer, Matthew | Broadcom Corporation |
| UHR SG | 8/7 | Fujimori, Yuki | Canon Research Centre France |
| UHR SG | 8/7 | Ghosh, Chittabrata | Apple Inc. |
| UHR SG | 8/7 | Gu, Junrong | Clourney Semiconductor |
| UHR SG | 8/7 | Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd.; Unisoc (Shanghai) Technologies Co., Ltd. |
| UHR SG | 8/7 | Haider, Muhammad Kumail | Meta Platforms Inc. |
| UHR SG | 8/7 | Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) |
| UHR SG | 8/7 | Hu, Xiaokun | Ruijie Networks Co., Ltd. |
| UHR SG | 8/7 | huang, kaikai | Nokia |
| UHR SG | 8/7 | Huang, Po-Kai | Intel |
| UHR SG | 8/7 | Inohiza, Hirohiko | Canon |
| UHR SG | 8/7 | Jang, Insun | LG ELECTRONICS |
| UHR SG | 8/7 | Jeon, Eunsung | SAMSUNG ELECTRONICS |
| UHR SG | 8/7 | Kakani, Naveen | Qualcomm Incorporated |
| UHR SG | 8/7 | Kamel, Mahmoud | InterDigital, Inc. |
| UHR SG | 8/7 | Kim, Geon Hwan | LG ELECTRONICS |
| UHR SG | 8/7 | Kim, Jeongki | Ofinno |
| UHR SG | 8/7 | Kim, Sang Gook | LG ELECTRONICS |
| UHR SG | 8/7 | Kim, Sanghyun | WILUS Inc. |
| UHR SG | 8/7 | Kim, Youhan | Qualcomm Technologies, Inc. |
| UHR SG | 8/7 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| UHR SG | 8/7 | Klein, Arik | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Klimakov, Andrey | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Kuo, Chih-Chun | MediaTek Inc. |
| UHR SG | 8/7 | Lanante, Leonardo | Ofinno |
| UHR SG | 8/7 | LEE, JOONSOO | Newracom Inc. |
| UHR SG | 8/7 | Levy, Joseph | InterDigital, Inc. |
| UHR SG | 8/7 | Li, Weiyi | Spreadtrum Communication USA, Inc |
| UHR SG | 8/7 | Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 8/7 | Lim, Dong Guk | LG ELECTRONICS |
| UHR SG | 8/7 | Lin, Wei | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Lou, Hanqing | InterDigital, Inc. |
| UHR SG | 8/7 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR SG | 8/7 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| UHR SG | 8/7 | Ma, Yunsi | HiSilicon (Shanghai) Technologies Co., LTD. |
| UHR SG | 8/7 | Minotani, Jun | Panasonic Corporation |
| UHR SG | 8/7 | Namvar, Nima | Charter Communications |
| UHR SG | 8/7 | Nayak, Peshal | Samsung Research America |
| UHR SG | 8/7 | Nezou, Patrice | Canon Research Centre France |
| UHR SG | 8/7 | Noh, Si-Chan | Newracom Inc. |
| UHR SG | 8/7 | Park, Sungjin | Senscomm |
| UHR SG | 8/7 | Patil, Abhishek | Qualcomm Incorporated |
| UHR SG | 8/7 | Petrick, Albert | InterDigital, Inc. |
| UHR SG | 8/7 | Qi, Yue | Samsung Research America |
| UHR SG | 8/7 | Quan, Yingqiao | Spreadtrum |
| UHR SG | 8/7 | Ryu, Kiseon | NXP Semiconductors |
| UHR SG | 8/7 | Schelstraete, Sigurd | MaxLinear |
| UHR SG | 8/7 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 8/7 | Shafin, Rubayet | Samsung Research America |
| UHR SG | 8/7 | Shen, Andy | Futurewei Technologies |
| UHR SG | 8/7 | Shilo, Shimi | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Song, Hao | Intel |
| UHR SG | 8/7 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Taori, Rakesh | Infineon Technologies |
| UHR SG | 8/7 | Tsodik, Genadiy | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Tsujimaru, Yuki | Canon Inc. |
| UHR SG | 8/7 | Wei, Dong | NXP Semiconductors |
| UHR SG | 8/7 | Wilhelmsson, Leif | Ericsson AB |
| UHR SG | 8/7 | Wu, Kanke | Qualcomm Incorporated |
| UHR SG | 8/7 | Yamada, Ryota | SHARP CORPORATION |
| UHR SG | 8/7 | Yang, Jimmy | Moxa Inc. |
| UHR SG | 8/7 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| UHR SG | 8/7 | Yi, Yongjiang | Spreadtrum Communication USA, Inc |
| UHR SG | 8/7 | Yoon, Yelin | LG ELECTRONICS |
| UHR SG | 8/7 | Yu, Jian | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Zhang, Yan | Apple Inc |
| UHR SG | 8/7 | Zhao, Yue | Huawei Technologies Co., Ltd |
| UHR SG | 8/7 | Zhou, Lei | H3C Technologies Co., Limited |
| UHR SG | 8/7 | Zhou, Pei | TCL |

Attendee List for 3rd Conf. Call:

Attendee List for 4th Conf. Call: