IEEE P802.11  
Wireless LANs

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| UHR SG November December 2022 teleconference minutes | | | | |
| Date: 2022-12-05 | | | | |
| Author(s): | | | | |
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|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This document contains the minutes for UHR SG November December 2022 teleconference.

Revision history:

* Rev0: add the minutes for teleconference call on Dec. 5th.
* Rev1: add the minutes for teleconference call on Dec. 19th. Corrected typo on the date of the 1st call.

Abbreviations:

* A: Answer
* C: Comment

# 1st Conf. Call: Dec 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:
    - 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 [11-22-2089r](https://mentor.ieee.org/802.11/dcn/22/11-22-2089-00-0uhr-uhr-sg-november-december-2022-teleconference-agendas.docx)0
  + Discussion:
    - None
  + Agenda approved with unanimous consent.
* Announcements:
  + None
* Submissions

Technical: M-AP

* + [11-22/1899r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1899-00-0uhr-multi-ap-operation-for-low-latency-traffic-delivery-follow-up.pptx) Multi-AP Operation for Low Latency Traffic Delivery - Follow up Liuming Lu (OPPO)
    - C: A general question, you mention some of the signaling may be over the backhaul. Are we going to define something in the .11 spec?
    - A: I think maybe some interface needs to be defined for the backhaul.
  + [11-22/1895r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1895-00-0uhr-thoughts-on-m-ap-coordination-principles.pptx) Thoughts on M-AP Coordination Principles Arik Klein (Huawei)
    - C: slide 6, the definition of the sharing AP is the AP who gains the TXOP. I am curious who the decision maker is for the long term?
    - A: We didn’t tell it here. We will show it in the future. There is long term info needs to be decided. We need different discussion. Once it is done, before the each of the coordinated transmission starts, those parameters of short term may be changed.
    - C: If you have backhaul, the coordination can happen in a quite large space.
    - A: There is still discussion on backhaul. We focus on the part related with WLAN. We want to avoid the relay.
    - C: We understand AP can talk to each other. I see a lot of opportunities there. We could see wireless, hybrid wireless, and pure wire.
    - C: We only mention multi-AP coordination. We don’t mention the trigger requirement to do that. The non-AP STA may oberserve info that the AP may not observe, may need to collect some info.
    - A: There can be. We want to mention here is there are people talking there is coordination within TXOP, the long term coordination mode. We don’t give any further details.
* 11-22/1821r0 and 11-22/1822r0 are deferred upon request.

General views and band support

* + [11-22/1924r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1924-00-0uhr-thoughts-on-uhr-features.pptx) Thoughts on UHR Features Xiaofei Wang (InterDigital)
    - C: slide 6, what do you mean by coordinated multi-link and coordinated handover?
    - A: It depends on how the coordination is setup. For example, multiple MLDs, negotiate on some specific link. For coordinated handover, a STA or an MLD, try to handover, could be ML transfer. Make connection before break scenario.
    - A: the coordination on ML is still not clear to me. We could discuss offline.
    - C: For multi-AP coordination when multiple APs are from the same adiministrive or not, we may need different solutions.
    - A: We should also consider to have some coorperation between different vendors. For mmwave, the question is here we need to analyze the pros and cons.
    - C: the reliability you mention is very high. To get the number of 9s, you need a very high level coordination.
    - A: that is the good point.
    - C: slide 10, what do you mean by multi-amendment aggregation?
    - A: Integration of multiple amendements, for example sensing, here is power saving for another aspect. If we design A-PPDU, we could levearage 11ba design.
    - C: The 8 9s, why it has to be 8 9s?
    - A: This is more detailed discussed in WNG contribution. Can share it to you.
* The chair reviewed the agenda, propose to continue with 11-1820r1 and 11-22/1841r0. The agenda is approved with no objections.
  + [11-22/1820r1](https://mentor.ieee.org/802.11/dcn/22/11-22-1820-01-0uhr-bf-feedback-with-the-optimal-svd.pptx) BF Feedback with the Optimal SVD Aiguo Yan (Zeku)
    - C: For TxBF, it is implemantion specific. The smaller Ng, in order to choose D?
    - A: We want to have the reconstruct SNR as big as possible.
    - C: do you propose smaller Ng?
    - A: The D is only needed to calculate SNR optimistically. BFer does not need to know this D.

* + [11-22/1841r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1841-00-0uhr-follow-up-on-the-low-power-listening.pptx) Follow up on the low power listening Xiaogang Chen (ZEKU)
    - C: Slide 4, is that true the time spends on different colors are different? Or the same?
    - A: 24 hours on the smart phone. The time on sleep is 6%. The listening is 35%. I am curious on the power consumption. How efficient the power has been used.
* Adjourned at 11:57 ET

# 2nd Conf. Call: Dec 19th 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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    - Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or
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  + 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 [11-22-2089r](https://mentor.ieee.org/802.11/dcn/22/11-22-2089-01-0uhr-uhr-sg-november-december-2022-teleconference-agendas.docx)1
  + Discussion:
    - None
  + Agenda approved with unanimous consent.
* Announcements:
  + None
* Submissions

Misc technical

* + [11-22/1970r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1970-00-0uhr-sinr-aware-spatial-reuse.pptx) SINR aware Spatial Reuse Sigurd Schelstraete (MaxLinear)
    - C: For 11ax, we have OBSS PD and PSR. Using PSR, the AP can figure out the transmission is tolerable or not. What are the difference between PSR and your method?
    - A: 2nd control frame, the AP can measure the pathloss. Still doesn’t solve AP2 to STA2, what the MCS should be used. AP1🡪 STA1 also affects AP2🡪 STA2.
    - C: Should AP2 also has the knowledge of the AP1🡪STA1 link?
    - A: the STA suffers the interference.
    - C: You make a good analysis to see SINR is quite importance. I agree with that. In UHR, many people discuss multi-AP. Under multi-AP, the APs could do coordinated spatial reuse. If they know the SINR ahead, could increase the Tput more. Have you considered that?
    - A: It is kind of orthogonal to that. Create the opportunity to do concuurent transmission. Need coordination. This is multi-AP. Some of the protocol is needed.
    - C: if we can do the measurement using multi-AP, we can also do data transmission using multi-AP.
  + [11-22/1931r1](https://mentor.ieee.org/802.11/dcn/22/11-22-1931-01-0uhr-follow-up-on-latency-reduction-with-machine-learning-techniques.pptx) Follow-up on latency reduction with machine learning techniques Ziyang Guo (Huawei)
    - C: Some concept has been discussed in AIML TIG. For standard impact slide, this is very nice slides giving people some high level idea of standard impact. You tell it is a real time report. How often it is?
    - A: The real time report, the info can be carried in the next packet to AP.
    - C: How often?
    - A: it depends on the algorthim design. The AP needs to know the transmission result. When collision occurs, the non-AP STA need to report the transmission result to AP. For example, using the next transmission opportunity. The AP can obtain the tranining data.
    - C: slide 9, the x-asis is time. The channel access, we are dealing time resolution of ms. Here it is second. Second, have you considered the power cost?
    - A: For your first question, here, x-asis is second. The number of associated STA won’t change that frequent. The proposed channel access can adapt to ms channel access. For capacity, we evaluate the complexity. The model is training offline. We only need to know the transmission status. We also use the FFT as a comparison of complexity. I think the NN model used here is very light-weight.
  + [11-22/1923r1](https://mentor.ieee.org/802.11/dcn/22/11-22-1923-01-0uhr-enhanced-trigger-based-uplink-transmission.pptx) Enhanced Trigger-Based Uplink Transmission Kazi Huq (Ofinno)
    - C: Your idea is to eliminate the 2nd trigger frame. How does it can be appilied in the real world if you assume the same allocation. Why would AP do that? How often the sequence will happen?
    - A: The first trigger frame will schedule STA1 for multiple transmission.
    - C: The AP plans for the whole TXOP. One shot for the entire TXOP.
    - C: I remember we have similar thing in 11ax proposed. The concern is that the regulatory has some concern on the fairness. It is better to check the regulatory restrictions.
    - A: Thanks.
  + [11-22/1939r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1939-00-0uhr-ppdu-design-for-short-frames.pptx) PPDU Design for Short Frames Leonardo Lanante (Ofinno)
    - C: What is the use case of the new short frame? Why cannot simply use VHT PPDU and non-HT PPDU?
    - A: control frame, short data frame. A PPDU optimize for short frame. Those doesn’t support some of the features for 11be, for example puncturing.
    - C: It also supports large bandwidth, indicated in U-SIG?
    - A: yes
    - C: How to do the channel estimation?
    - A: using L-LTF.

Technical: M-AP

* + [11-22/1821r1](https://mentor.ieee.org/802.11/dcn/22/11-22-1821-01-0uhr-system-level-simulation-of-co-bf-and-joint-tx.pptx) System Level Simulation of Co-BF and Joint Tx Kosuke Aio (Sony Group Corporation)
    - C: Slide 9, for joint Tx, both AP1 and AP2 are transmitting to the same STA.
    - A: In joint Tx, AP1 and AP2 simultanoues transmit data to STA1 and STA2. The difference between joint transmission and coordinated beamforming is data sharing. For joint Tx, AP1 and AP2 can use MU-MIMO.
    - C: for joint Tx, AP1 and AP2 are both transmitting to the same STA. You need to check the SINR of STA1 and STA2 seperately.
    - A: let’s do offine discussion.
    - C: slide 10, the TxSS per STA means number of SS per STA, right?
    - A: yes.
    - C: It is interesting to see the blue curve, is not smooth. In the simulation, the data sharing part is already considered?
    - A: yes. For CoBF, data sharing is not required. For joint transimissoin, we have considered data sharing overhead in the simulation.
    - C: what data rate are you using for data sharing? Same channel?
    - A: 10Gbps using cable.
* Adjourned at 11:51 ET

# Appendix

* + Attendee List for 1st Conf. Call: Dec. 5th Monday (10:00–12:00 ET)

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| UHR | 12/5 | Aboulmagd, Osama | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Ajami, Abdel Karim | Qualcomm Technologies, Inc |
| UHR | 12/5 | Amalladinne, Vamsi | Qualcomm Incorporated |
| UHR | 12/5 | Ansley, Carol | Cox Communications Inc. |
| UHR | 12/5 | Asai, Yusuke | NTT |
| UHR | 12/5 | B, Hari Ram | NXP Semiconductors |
| UHR | 12/5 | baron, stephane | Canon Research Centre France |
| UHR | 12/5 | Baykas, Tuncer | Ofinno |
| UHR | 12/5 | Bluschke, Andreas | Representing myself |
| UHR | 12/5 | Bredewoud, Albert | Broadcom Corporation |
| UHR | 12/5 | Cao, Rui | NXP Semiconductors |
| UHR | 12/5 | Carney, William | Sony Group Corporation |
| UHR | 12/5 | Chen, You-Wei | MediaTek Inc. |
| UHR | 12/5 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| UHR | 12/5 | CHERIAN, GEORGE | Qualcomm Incorporated |
| UHR | 12/5 | Chng, Shi Baw | BAWMAN LLC |
| UHR | 12/5 | Cho, Hangyu | LG ELECTRONICS |
| UHR | 12/5 | Choi, Jinsoo | LG ELECTRONICS |
| UHR | 12/5 | Chu, Liwen | NXP Semiconductors |
| UHR | 12/5 | CHUN, JINYOUNG | LG ELECTRONICS |
| UHR | 12/5 | Chung, Chulho | SAMSUNG |
| UHR | 12/5 | Coffey, John | Realtek Semiconductor Corp. |
| UHR | 12/5 | Erkucuk, Serhat | Ofinno |
| UHR | 12/5 | Fan, Shuang | ZTE Corporation |
| UHR | 12/5 | Fang, Yonggang | MediaTek Inc. |
| UHR | 12/5 | Fischer, Matthew | Broadcom Corporation |
| UHR | 12/5 | Fujimori, Yuki | Canon Research Centre France |
| UHR | 12/5 | Gidvani, Ravi | SAMSUNG ELECTRONICS |
| UHR | 12/5 | Gu, Xiangxin | Unisoc |
| UHR | 12/5 | GUIGNARD, Romain | Canon Research Centre France |
| UHR | 12/5 | Gupta, Binita | Meta Platforms, Inc. |
| UHR | 12/5 | Gupta, Raghvendra | Broadcom Corporation |
| UHR | 12/5 | Hedayat, Ahmadreza | Apple Inc. |
| UHR | 12/5 | Hernandez, Marco | National Institute of Information and Communications Technology (NICT) |
| UHR | 12/5 | Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) |
| UHR | 12/5 | Ho, Duncan | Qualcomm Incorporated |
| UHR | 12/5 | Hu, Chunyu | Facebook |
| UHR | 12/5 | Hu, Shengquan | MediaTek Inc. |
| UHR | 12/5 | Huang, Lei | Huawei International Pte Ltd |
| UHR | 12/5 | Huang, Po-Kai | Intel |
| UHR | 12/5 | Huq, Kazi Mohammed Saidul | Ofinno |
| UHR | 12/5 | Ik, Jang | Gachon University |
| UHR | 12/5 | Jang, Insun | LG ELECTRONICS |
| UHR | 12/5 | Kain, Carl | USDOT; Noblis, Inc. |
| UHR | 12/5 | Kakani, Naveen | Qualcomm Incorporated |
| UHR | 12/5 | kamath, Manoj | Broadcom Corporation |
| UHR | 12/5 | Kandala, Srinivas | SAMSUNG |
| UHR | 12/5 | Kasher, Assaf | Qualcomm Incorporated |
| UHR | 12/5 | Kim, Jeongki | Ofinno |
| UHR | 12/5 | Kim, Myeong-Jin | SAMSUNG |
| UHR | 12/5 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| UHR | 12/5 | Klein, Arik | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Lalam, Massinissa | SAGEMCOM SAS |
| UHR | 12/5 | Lanante, Leonardo | Ofinno |
| UHR | 12/5 | Li, Yunbo | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Lin, Zinan | InterDigital, Inc. |
| UHR | 12/5 | Liu, Jianhan | MediaTek Inc. |
| UHR | 12/5 | Lorgeoux, Mikael | Canon Research Centre France |
| UHR | 12/5 | Lou, Hanqing | InterDigital, Inc. |
| UHR | 12/5 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR | 12/5 | Ma, Yunsi | HiSilicon (Shanghai) Technologies Co., LTD. |
| UHR | 12/5 | MAO, ZHI | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Martinez Vazquez, Marcos | MaxLinear Corp |
| UHR | 12/5 | Max, Sebastian | Ericsson AB |
| UHR | 12/5 | Montreuil, Leo | Broadcom Corporation |
| UHR | 12/5 | Nezou, Patrice | Canon Research Centre France |
| UHR | 12/5 | Pandey, Sheetal | ZAF Energy |
| UHR | 12/5 | Park, Minyoung | Intel |
| UHR | 12/5 | Patil, Abhishek | Qualcomm Incorporated |
| UHR | 12/5 | Petrick, Albert | InterDigital, Inc. |
| UHR | 12/5 | Pettersson, Charlie | Ericsson AB |
| UHR | 12/5 | Qi, Yue | Samsung Research America |
| UHR | 12/5 | Quan, Yingqiao | Unisoc |
| UHR | 12/5 | Ratnam, Vishnu | Samsung Research America |
| UHR | 12/5 | Redlich, Oded | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Ryu, Kiseon | NXP Semiconductors |
| UHR | 12/5 | Schelstraete, Sigurd | MaxLinear |
| UHR | 12/5 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute International (ATR) |
| UHR | 12/5 | Sherlock, Ian | Texas Instruments Inc. |
| UHR | 12/5 | Shilo, Shimi | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Smith, Luther | Cable Television Laboratories Inc. (CableLabs) |
| UHR | 12/5 | Son, Ju-Hyung | WILUS Inc. |
| UHR | 12/5 | Sun, Bo | Sanechips |
| UHR | 12/5 | Tadahal, Shivkumar | Broadcom Corporation |
| UHR | 12/5 | Tanaka, Yusuke | Sony Group Corporation |
| UHR | 12/5 | Taori, Rakesh | Infineon Technologies |
| UHR | 12/5 | Tsodik, Genadiy | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Tsujimaru, Yuki | Canon Inc. |
| UHR | 12/5 | Val, Inaki | MaxLinear, Inc. |
| UHR | 12/5 | Varshney, Prabodh | Nokia |
| UHR | 12/5 | Verma, Sindhu | Broadcom Corporation |
| UHR | 12/5 | Vermani, Sameer | Qualcomm Incorporated |
| UHR | 12/5 | VIGER, Pascal | Canon Research Centre France |
| UHR | 12/5 | Wang, Qi | Apple, Inc. |
| UHR | 12/5 | Wang, Xiaofei | InterDigital, Inc. |
| UHR | 12/5 | Yamada, Ryota | SHARP CORPORATION |
| UHR | 12/5 | Yan, Aiguo | Zeku |
| UHR | 12/5 | Yang, Jay | Nokia |
| UHR | 12/5 | YANG, RUI | InterDigital, Inc. |
| UHR | 12/5 | Yang, Steve TS | MediaTek Inc. |
| UHR | 12/5 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| UHR | 12/5 | Yee, James | MediaTek Inc. |
| UHR | 12/5 | Yi, Yongjiang | Spreadtrum Communication USA, Inc |
| UHR | 12/5 | Yu, Jian | Huawei Technologies Co., Ltd |
| UHR | 12/5 | Zhang, Jiayi | Ofinno |

* + Attendee List for 2nd Conf. Call: Dec. 19th Monday (10:00–12:00 ET)

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| UHR | 12/19 | Aboulmagd, Osama | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Aio, Kosuke | Sony Corporation |
| UHR | 12/19 | Ajami, Abdel Karim | Qualcomm Technologies, Inc |
| UHR | 12/19 | Akhmetov, Dmitry | Intel |
| UHR | 12/19 | Asai, Yusuke | NTT |
| UHR | 12/19 | Asterjadhi, Alfred | Qualcomm Technologies, Inc |
| UHR | 12/19 | Baek, SunHee | LG ELECTRONICS |
| UHR | 12/19 | Bankov, Dmitry | IITP RAS |
| UHR | 12/19 | Baykas, Tuncer | Ofinno |
| UHR | 12/19 | Bluschke, Andreas | Representing myself |
| UHR | 12/19 | Bredewoud, Albert | Broadcom Corporation |
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| UHR | 12/19 | Chen, You-Wei | MediaTek Inc. |
| UHR | 12/19 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| UHR | 12/19 | Chng, Shi Baw | BAWMAN LLC |
| UHR | 12/19 | Chung, Chulho | SAMSUNG |
| UHR | 12/19 | Coffey, John | Realtek Semiconductor Corp. |
| UHR | 12/19 | DeLaOlivaDelgado, Antonio | InterDigital, Inc. |
| UHR | 12/19 | Erkucuk, Serhat | Ofinno |
| UHR | 12/19 | Fan, Shuang | ZTE Corporation |
| UHR | 12/19 | Fang, Yonggang | MediaTek Inc. |
| UHR | 12/19 | Fischer, Matthew | Broadcom Corporation |
| UHR | 12/19 | Fujimori, Yuki | Canon Research Centre France |
| UHR | 12/19 | Goto, Fumihide | DENSO |
| UHR | 12/19 | Guo, Ziyang | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Gupta, Binita | Meta Platforms, Inc. |
| UHR | 12/19 | Haider, Muhammad Kumail | Meta Platforms Inc. |
| UHR | 12/19 | Handte, Thomas | Sony Group Corporation |
| UHR | 12/19 | Henry, Jerome | Cisco Systems, Inc. |
| UHR | 12/19 | Hernandez, Marco | National Institute of Information and Communications Technology (NICT) |
| UHR | 12/19 | Ho, Duncan | Qualcomm Incorporated |
| UHR | 12/19 | Huang, Lei | Huawei International Pte Ltd |
| UHR | 12/19 | Huang, Po-Kai | Intel |
| UHR | 12/19 | Huq, Kazi Mohammed Saidul | Ofinno |
| UHR | 12/19 | Jang, Insun | LG ELECTRONICS |
| UHR | 12/19 | Jungnickel, Volker | Fraunhofer Heinrich Hertz Institute |
| UHR | 12/19 | Kakani, Naveen | Qualcomm Incorporated |
| UHR | 12/19 | kamath, Manoj | Broadcom Corporation |
| UHR | 12/19 | Kim, Hyungjin | Broadcom Corporation |
| UHR | 12/19 | Kim, Jeongki | Ofinno |
| UHR | 12/19 | Kim, Youhan | Qualcomm Technologies, Inc. |
| UHR | 12/19 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| UHR | 12/19 | Klein, Arik | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Kneckt, Jarkko | Apple, Inc. |
| UHR | 12/19 | Lanante, Leonardo | Ofinno |
| UHR | 12/19 | Levy, Joseph | InterDigital, Inc. |
| UHR | 12/19 | Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR | 12/19 | Lou, Hanqing | InterDigital, Inc. |
| UHR | 12/19 | Lovison, Federico | Cisco Systems, Inc. |
| UHR | 12/19 | Lu, kaiying | MediaTek Inc. |
| UHR | 12/19 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| UHR | 12/19 | Ma, Yunsi | HiSilicon (Shanghai) Technologies Co., LTD. |
| UHR | 12/19 | Mantha, Abhishek | Broadcom Corporation |
| UHR | 12/19 | MAO, ZHI | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Martinez Vazquez, Marcos | MaxLinear Corp |
| UHR | 12/19 | Max, Sebastian | Ericsson AB |
| UHR | 12/19 | Moelker, Dignus-Jan | Broadcom Corporation |
| UHR | 12/19 | Montemurro, Michael | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Montreuil, Leo | Broadcom Corporation |
| UHR | 12/19 | Motozuka, Hiroyuki | Panasonic Holdings Corporation |
| UHR | 12/19 | Mutgan, Okan | Nokia |
| UHR | 12/19 | Nayak, Peshal | Samsung Research America |
| UHR | 12/19 | Palayur, Saju | Maxlinear Inc. |
| UHR | 12/19 | Pandey, Sheetal | ZAF Energy |
| UHR | 12/19 | Park, Minyoung | Intel |
| UHR | 12/19 | Patil, Abhishek | Qualcomm Incorporated |
| UHR | 12/19 | Patwardhan, Gaurav | Hewlett Packard Enterprise |
| UHR | 12/19 | Pettersson, Charlie | Ericsson AB |
| UHR | 12/19 | Quan, Yingqiao | Unisoc |
| UHR | 12/19 | Rai, Kapil | Qualcomm Incorporated |
| UHR | 12/19 | Ratnam, Vishnu | Samsung Research America |
| UHR | 12/19 | Ryu, Kiseon | NXP Semiconductors |
| UHR | 12/19 | Sand, Stephan | German Aerospace Center (DLR) |
| UHR | 12/19 | Schelstraete, Sigurd | MaxLinear |
| UHR | 12/19 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute International (ATR) |
| UHR | 12/19 | Sevin, Julien | Canon Research Centre France |
| UHR | 12/19 | Shen, Andy | Futurewei Technologies |
| UHR | 12/19 | Sherlock, Ian | Texas Instruments Inc. |
| UHR | 12/19 | Shu, Tongxin | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Song, Hao | Intel |
| UHR | 12/19 | Stanley, Dorothy | Hewlett Packard Enterprise |
| UHR | 12/19 | Strobel, Rainer | Maxlinear |
| UHR | 12/19 | Taori, Rakesh | Infineon Technologies |
| UHR | 12/19 | Tsujimaru, Yuki | Canon Inc. |
| UHR | 12/19 | Val, Inaki | MaxLinear, Inc. |
| UHR | 12/19 | Wang, Chao Chun | MediaTek Inc. |
| UHR | 12/19 | Wang, Hao | Tencent |
| UHR | 12/19 | Wang, Lei | Futurewei Technologies |
| UHR | 12/19 | Yamada, Ryota | SHARP CORPORATION |
| UHR | 12/19 | Yan, Aiguo | Zeku |
| UHR | 12/19 | Yang, Jay | Nokia |
| UHR | 12/19 | YANG, RUI | InterDigital, Inc. |
| UHR | 12/19 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| UHR | 12/19 | Yee, James | MediaTek Inc. |
| UHR | 12/19 | Yi, Yongjiang | Spreadtrum Communication USA, Inc |
| UHR | 12/19 | Yu, Jian | Huawei Technologies Co., Ltd |
| UHR | 12/19 | Zhang, Jiayi | Ofinno |
| UHR | 12/19 | Zhou, Lei | H3C Technologies Co., Limited |
| UHR | 12/19 | Zuniga, Juan Carlos | Cisco Systems, Inc. |