IEEE P802.11  
Wireless LANs

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| UHR SG March 2023 Meeting Minutes | | | | |
| Date: 2023-03-12 | | | | |
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Abstract

This document contains the minutes for the UHR SG March 2023 Meeting Minutes.

Revision history:

* Rev0: initial version.

Abbreviations:

* C: Comment
* A: answer

# 1st Call: Monday, PM2, (16:00-18:00 ET)

* + The Chair, Laurent Cariou (Intel), calls the meeting to order. The Chair notifies the attendees that the agenda is in [11-23-0186r3](https://mentor.ieee.org/802.11/dcn/23/11-23-0186-03-0uhr-uhr-sg-march-2023-meeting-agenda.pptx).
  + Note that this is a hybrid meeting, with some participants in person and some participating online through a webex session
  + Need to pay the registration fee to attend

1. IEEE-SA Policies and Procedure

The chair reviews the IEEE-SA Patent Policy:

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. Speak up now and respond to this Call for Potentially Essential Patents. **Nobody speaks/writes up**.

1. The chair goes through other guidelines for IEEE WG meetings, Patent-related information, Participation in IEEE 802 Meetings, and Copyright. The Chair asks that it be minuted that the **Copyright Policy** was presented.
   * Chair provides an attendance reminder:

3.1. Please record your attendance during the session by using the IMAT system:

* + login to [imat](https://imat.ieee.org/attendance)
  + select “802 Plenary Mixed-mode Session - March 2023”
  + select “C/LM/WG802.11 Attendance” entry
  + click “UHR SG session that you are attending
  1. If you are unable to record your attendance contact Laurent Cariou (laurent.cariou@intel.com) and Ross Jian Yu (ross.yujian@huawei.com) for assistance

1. Agenda:
   * Chair reviews proposed agenda
   * Discussion:
     1. None
   * Agenda approved with unanimous consent.
2. Announcements:
   * None
3. Approval of SG Minutes

Move to approve UHR SG minutes listed below:

* + Jan plenary:
    - <https://mentor.ieee.org/802.11/dcn/23/11-23-0094-00-0uhr-uhr-sg-jan-2023-meeting-minutes.docx>
  + Teleconferences January February:
    - <https://mentor.ieee.org/802.11/dcn/23/11-23-0192-01-0uhr-uhr-sg-jan-feb-2023-teleconference-minutes.docx>

Move: Ross Jian Yu Second: Peshal Nayak

Discussion: None

Result: approved with unanimous consensus

PAR discussion

* + [11-23-0078r](https://mentor.ieee.org/802.11/dcn/23/11-23-0078-04-0uhr-uhr-draft-proposed-par.docx)4 UHR Draft Proposed PAR Laurent Cariou (Intel)
* The author asks people to send comments before Wednesday through email if there are any.
* C: Want to confirm that security improvement is allowed given the current PAR.
* A: No language prevents that.
* C: People in Nescom does not know what 802.11be is. Maybe try to find another language. My second comment is that there is no tail latency, maybe use tail distribution of latency. Third, Nescom wants to avoid wording like high, more or less, they prefer more precise numbers.
* A: In 11ax, we use the previous generation.
* C: In 11ax, we don’t say VHT.
* A: we do mention previous generation.
* C: Osama is right, words like more or less, we need to avoid unless we really need to compare. Maybe use improve, that’s OK. The last sentence of will, that also needs to be avoid. Another thing is about quantify about ultra-high. Provide an explaination is another option to consider.
  + [11-23-0079r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0079-00-0uhr-uhr-draft-proposed-csd.docx) Update on Draft Proposed CSD presented by Lili Hervieu (CableLabs), uploaded by Laurent Cariou (Intel)
* C: You talk about connecting people. I would like to suggest to add things too.
  + 11-23-0244r0 AP Power Save PAR addition proposal Amelia Andersdotter (Sky Group/Comcast) et al
* C: It is straight forward and good for the industry. Should consider the legacy.
* C: power save is a bit separate from reliability. Maybe only keep the last bullet for simplicity.
* C1: maybe simply say power save for clients and APs.
* A: want to emphasize for the AP.
* C: Power save for AP could be seen as ultra high relaiblity.
* A: agree with that.
* C: power save mode for mobile-AP should also be covered.
* C2: AP power save needs to maintain ultra high relaiblity at the same time.
* C: I do agree with C2, if you really want to add the text here, needs to maintain ultra high reliability. Also agree with C1, we don’t need much wording. Just simply say power saving mechanism, should be fine.
  + [11-23-0292r1](https://mentor.ieee.org/802.11/dcn/23/11-23-0292-01-0uhr-kpis-for-industrial-automation-use-cases.pptx) KPIs for Industrial Automation Use Cases Akira Kishida (NTT)
  + C: the latency and reliability is very critical.Giving the exact number, I am not too comfortable with that. We need to be careful with one number.
  + C: putting a number is good for market, but on the other hand, it depends on many parameters. Probably nothing gonna change the work we do here. There is no strong need for that.
* SP1: Do you agree that UHR target improvement for deterministic (periodic) and non-deterministic (sporadic) latency characteristics?
  + -Yes
  + -No
  + -Abstain

C: What does this SP mean? The current PAR already includes latency.

A: intends to include both types of latency. I’d like to know how many people think sporadic latency characteristics is also important.

C: You just want to clarify the target latency improvement, one is deterministic and one is non-deterministic, is that ture? What’s the different from the existing scope?

A: this SP does not impact the PAR.

A: for example R-TWT, can only support deterministic. For UHR, we could also improve latency for non-determinsitc latency.

C: similar question, there is no other traffic other than these two. The PAR does not exclude that.

**Result: 73/36/81/128 Y/N/A/No answer**

* SP2: Do you agree that the UHR PAR should have the target number for the latency bound and reliability of industrial automation?
  + NOTE: Use cases of industrial automation are described in the RTA report [2].
  + -Yes
  + -No
  + -Abstain

C: latency bound and reliability is for industrial automation or for a range of applications.

C: Need to find some number that is generic to different use cases. It should be tricky to do that in general manner.

SP2 is widthdrawed.

1. Submissions
   * [11-23-0066r](https://mentor.ieee.org/802.11/dcn/23/11-23-0066-02-0uhr-thoughts-on-utiliizing-mmwave.pptx)2 Thoughts on Utilizing mmWave Mengshi Hu (Huawei)
     + C: Thanks for the simulation results for mmwave. Why you use 40ppm? We can assume tigher requirement on hardware.
     + A: in the spec of 11ax, 11be in sub 7GHz, they use 20ppm oscillator. For Tx and Rx together, we use 40ppm for the simulation.
     + C: It depends on what type of phase noise you use?
     + A: Use 11ad phase noise. We use the zero pole model.
     + C: All these groups define OFDM PHYs in mmwave. They all failed. Have you looked why these previous PHY fails. I just don’t see it. How you make this successful.
     + A: previous PHYs use single carrier preamble, and also need to satisfy OFDM requirement. We just use same PPDU as sub 7GHz. Only upclocking is needed. May need some minor change.
   * Recess at 17:50 ET

# 2nd Call: Wednesday, AM1, (08:00-10:00 ET)

1. The Chair, Laurent Cariou (Intel), calls the meeting to order. The Chair notifies the attendees that the agenda is in [11-23-0186r5](https://mentor.ieee.org/802.11/dcn/23/11-23-0186-05-0uhr-uhr-sg-march-2023-meeting-agenda.pptx).
   1. Note that this is a hybrid meeting, with some participants in person and some participating online through a webex session
   2. Need to pay the registration fee to attend
2. IEEE-SA Policies and Procedure

The chair reviews the IEEE-SA Patent Policy:

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1. The chair goes through Other guidelines for IEEE WG meetings, Patent-related information, Participation in IEEE 802 Meetings, and Copyright. The Chair asks that it be minuted that the **Copyright Policy** was presented.
   * Chair provides an attendance reminder:

3.1. Please record your attendance during the session by using the IMAT system:

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  + select “C/LM/WG802.11 Attendance” entry
  + click “UHR SG session that you are attending

3.2 If you are unable to record your attendance contact Laurent Cariou (laurent.cariou@intel.com) and Ross Jian Yu (ross.yujian@huawei.com) for assistance

1. Agenda:
   * Chair reviews proposed agenda.
   * Discussion:
     1. One comment on version update of the contribution
   * Agenda approved with unanimous consent.
2. Announcements:
   * None
3. Submissions

**mmWave**

* + [11-23-0165r](https://mentor.ieee.org/802.11/dcn/23/11-23-0165-02-0uhr-realistic-rates-on-60ghz-terminals.pptx)2 Realistic Rates on 60GHz terminals Rethna Pulikkoonattu (Broadcom Inc)
  + C: Thanks for analysis. The pure PHY rate comparison, some of the assmuptions I don’t agree. Don’t want to spend time arguing that. The reason is that the spectrum. How many 320MHz you can get? If you look at those data rate, for the 1st generation, it already supports 1/2 Gbps data rate, which is already good enough for majority of applications, low latency.
  + A: I do understand the scenario of offloading. The question is the cost and power consumption.
  + C: I agree there is some challenging, we will work together and balance the performance, power consumption, cost, and the industry can get healthy.
  + C: Regarding the implementation issue, there are some products which can work in 60GHz. We can have far more 320 MHz in mmwave. 6GHz is not allowed in some region, and 480MHz only in some region.
  + A: my argument is regarding the data rate. I do agree that there is some region 6GHz is not possible. Whilst in some region, it does have more spectrum.
  + C: mmwave has lots of spectrum, even using low MCS will increase the Tput. It will be disappointed if we define large bandwidth that is not usable.
  + A: it is much harder for 60 GHz. I am not saying it is not possible. The question is what we need to pay for it. From client side, there is no realistic.
  + C: I suggest you look at some of the implementation of 11ay. Some companies measured the LOS scenario. Where do you get the information that you cannot get more than 1SS? Moreover, for 60GHz, you use beamforming, that has much larger gain, that can compmensates the pathloss.
  + A: the data rate itself is from 11ac. I don’t know what rates you are talking in 11ay.
  + C: there are numerous measurement of the channels. All of them are available for 11ay. You can refer to the mentor.
  + A: I am talking in a more realistic ways.

**Motion on mmWave inclusion in UHR PAR and discussion**

**Move to include carrier frequency operation between 42.5 and 71 GHz in section 5.2b of the UHR PAR document?**

**Move: Micky Mehta Second: Srinivas Kandal**

**Discussion:**

C: Speaking in favor of the motion. Has a lot of discussion. We are talking 5,6,7 years later. They see a significant interests in applications like XR, gaming and enterprise. The other thing, spectrum needs, if you look at dense scenario, if you want to get 1Gpbs, 2.5Gpbs for whole coverage.

C: I speak against the motion. The first thing is the cost and the failure of 11ad, 11ay. We have very good features for UHR in sub 7GHz. If we want to include mmwave, it will shadow other features and delay the process. If people are interested in it, can develop another group. For the believers, you have the work to do, and make it happen.

C: I am speaking against of the motion. The mainstream Wi-Fi, I urge people to take mmwave out of it. It is risky.

C: I am speaking in favor of this motion. The market is close to 2030. In that time frame, better links and lots of capacity. That’s gonna require much lower latency and much higher capacity. With MLO structure, the whole power consumption, can make the operation in 60GHz more efficient.

C: I am speaking of the motion. UHR needs new applications. I do have questions, who can vote on the motion?

Chair: SG motion, anyone can vote. Has to register the session. The goal is to achieve 75% percentage.

C: all motions in a SG needs a 75%.

**Result:** 168/172/29/48 **Y/N/A/No response**

C: Y/N is about 50-50.. I’d like to run the SP, to test the water. Create a separate group for mmwave.

**Straw Poll**

Do you support the creation of a Study Group that will be tasked with the creation of a PAR and CSD for a stnadards project to specify carrier frequency operation between 42.5 and 71 GHz that leverages the MAC/PHY specifications in the existing sub 7GHz bands and the future UHR amendement to be developed?

**Result: 226/95/43/51 Y/N/A/No response**

**PAR/CSD discussion if needed**

The chair reviewed 11-23/0078r7, updated the band support to between 1GHz and 7.125GHz.

* + [11-23-0078r](https://mentor.ieee.org/802.11/dcn/23/11-23-0078-07-0uhr-uhr-draft-proposed-par.docx)7 UHR Draft Proposed PAR Laurent Cariou (Intel)

Plan to have a vote on the updated PAR on Thur call.

C: Add GHz after every number of band. Should include “IEEE” before each 802.11

A: will handle the editorial.

C: Should be IEEE Std 802.11, IEEE P802.11be

* + [11-23-0221r1](https://mentor.ieee.org/802.11/dcn/23/11-23-0221-01-0uhr-hybrid-lc-and-rf-in-uhr.pptx) Hybrid LC and RF in UHR, Volker Jungnickel (Fraunhofer HHI)
* C: I am in general like MLO supporting all PHYs.
* C: I do support the idea of MLO. You saw the discussion this morning, similar thought have this as the study activity.
* A: Has some technical issues that are hard to clarify. Should be done in the mainstream. Such intergration should be enabled in UHR.

**Straw Poll**: would you support that

1. UHR integrates LC into the Multilink Operations framework?
2. A New Study Group is formed to integrate LC and RF using MLO?
3. Abstain.

C: what’s the purpose? Cllect information or put it in the PAR?

A: It would be one of the next things to do.

C: could you add option D, no for option A and option B.

A: not useful for LC, add it to MLO will complicate MLO. Want to have a separate product instead of building together with Wi-Fi.

C: integration in MLO has lower latency, and can be aware of the channel

C: don’t think this is a good SP. The previous motion and SP are all very well organized.

C: People need to understand your SP.

C: Could run separately subbullet b.

C: I think subbullet b should be not run in this group. Should take to put in WNG or 11WG.

C: ask whether LC wants to be part of the PAR.

C: Free to run a SP, and ask people opinion’s feedback.

C: A SP is to ask people’s opinon. It does not lead to anything. It is not an approval of anything.

**Updated SP1**: **would you support that UHR integrates LC into the Multilink Operations framework?**

**Result: 27Y/182N/45A/134 no response**

**Updated SP2**: **Would you support that a New Study Group is formed to study the integratione of LC and RF using MLO?**

**Result: 65Y/105N/93A/125 no response**

* + [11-22-1910r](https://mentor.ieee.org/802.11/dcn/22/11-22-1910-03-0uhr-seamless-roaming-for-uhr.pptx)3 Seamless Roaming for UHR Duncan Ho (Qualcomm)
* Q&A is deferred to the next session due to time limit
  + Recess at 09:59 ET

# 3rd Call: Thursday, AM2, (10:30-12:30 ET)

1. The Chair, Laurent Cariou (Intel), calls the meeting to order. The Chair notifies the attendees that the agenda is in [11-23-0186r7](https://mentor.ieee.org/802.11/dcn/23/11-23-0186-07-0uhr-uhr-sg-march-2023-meeting-agenda.pptx).
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2. Chair provides an attendance reminder:

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  + select “C/LM/WG802.11 Attendance” entry
  + click “UHR SG session that you are attending
  1. If you are unable to record your attendance contact Laurent Cariou (laurent.cariou@intel.com) and Ross Jian Yu (ross.yujian@huawei.com) for assistance

1. Agenda:
   * Chair reviews proposed agenda
   * Discussion
     1. None
   * Agenda approved with unanimous consent.
2. PAR and CSD motions

**The chair reviewed the PAR in** [**11-23/0480r0**](https://mentor.ieee.org/802.11/dcn/23/11-23-0480-00-0uhr-uhr-proposed-par.pdf) **and the CSD in** [**11-23/0079r5**](https://mentor.ieee.org/802.11/dcn/23/11-23-0079-05-0uhr-uhr-draft-proposed-csd.docx)**.**

**PAR Approval Motion**

**Believing that the PAR contained in the document referenced below meets IEEE-SA guidelines,**

**Request that the PAR contained in11-23/0480r0 <**[**https://mentor.ieee.org/802.11/dcn/23/11-23-0480-00-0uhr-uhr-proposed-par.pdf**](https://mentor.ieee.org/802.11/dcn/23/11-23-0480-00-0uhr-uhr-proposed-par.pdf)**> be posted to the IEEE 802 Executive Committee (EC) agenda for WG 802 preview and EC approval to submit to NesCom.**

**Moved by [] on behalf of UHR SG**

**UHR SG vote:**

**Moved: Sean Coffey Seconded: Steve Palm ,**

**-Result: 241(+2)-13-16-68 Y/N/A/No response, motion passed**

Two people vote yes in the room

A third person in the room votes yes and wants to further check if his vote is duplicated in webex.

**CSD Approval Motion**

**Believing that the CSD contained in the document referenced below meets IEEE 802 guidelines,**

**Request that the CSD contained in 11-23/0079r5 <**[**https://mentor.ieee.org/802.11/dcn/23/11-23-0079-05-0uhr-uhr-draft-proposed-csd.docx**](https://mentor.ieee.org/802.11/dcn/23/11-23-0079-05-0uhr-uhr-draft-proposed-csd.docx)**> be posted to the IEEE 802 Executive Committee (EC) agenda for WG 802 preview and EC approval.**

**Moved by [] on behalf of UHR SG**

**UHR SG vote:**

**Moved: Ross Jian Yu Seconded: Akira Kishida**

**- Result: 250-4-13-85 – Y/N/A/No response, motion passed**

C: consider approval of the motions by 11WG in closing plenary. Would submit to 802 EC for review on Friday afternoon. All WGs then can comment on the documents. In July, we will get comments from other WGs. In July, we will get these documents approved by EC. Then go to Nescom for Sep. The first meeting of task group will be in Novmember. Before November, will offer a venue to continue the tasks within this group.

1. Announcements:
   * [11-23/0481r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0481-00-0uhr-imw-sg-formation-motion-text.pptx) IMW SG Formation Motion Text Rolf de Vegt (Qualcomm)

* C: leverage the MAC/PHY specifications, what is the object? The other is UHR amendment, what is the subject for this phase? Is it like to be merged into UHR or a different task group?
* A: It is a WG motion that will come tomorrow. Let’s make the discussion offline.

1. Submissions
   * [11-22-1910r](https://mentor.ieee.org/802.11/dcn/22/11-22-1910-03-0uhr-seamless-roaming-for-uhr.pptx)3 Seamless Roaming for UHR (Q&A) Duncan Ho (Qualcomm)

* C: I understand the intention, to use ML structure to support common secure. Puzzle on the BA agreement. You probably have one host for the BA agreement. Now if you have non-co-located APs, cannot have one single host driver.
* A: Multiple modes. For simpler version, one AP serves one STA at a time.
* C: single mobility domain MLD, just for seamless roaming or could be generalized to multiple AP?
* A: It is not the intention. We have to work on that part.
* C: slide 13, you mention PTK, BA, PN/SN are within MLD level, why AID is per AP.
* A: AID needs to be unique to identify the client.
* C: co-located set is the AP MLD we define today. Why you define a different co-located set?
* A: The co-located is not just AP MLD. It is the lower part of the AP MLD. It is also mentioned in slide 14.
  + [11-23-0046r2](https://mentor.ieee.org/802.11/dcn/23/11-23-0046-02-0uhr-multi-ap-coordination-for-low-latency-traffic-delivery-usage-scenarios-and-potential-features.pptx) Multi-AP Coordination for Low Latency Traffic Delivery: Usage Scenarios and potential features Liuming Lu (OPPO)
* C: Genearal question, slide 8 and slide 10, the AP are coordinating. There can be other STAs, how do you think this will work?
* C: Is it like co-spatial reuse, C-TDMA? Why define new mode?
* Offline discussions
  + [11-23-0058r](https://mentor.ieee.org/802.11/dcn/23/11-23-0058-00-0uhr-spatial-reuse-in-coordinated-m-ap-for-uhr.pptx)0 Spatial Reuse in Coordinated M-AP for UHR Rui Yang (InterDigital)
* C: Slide 4, there is a diagram for PSR based spatial reuse. This has been discussed in 11ax. You use the beacon to test the RSSI. That part should be already covered. SRG, more explicit signaling, exchange information about SRG group. Back in 11ax, those information can be exchanged out of 11 system.
* A: The difference is how the cooperation is done on what level. For the first question, we can discuss offline.
* C: Co-SR, one is ax based, the other is trigger based. In UHR, with AP coordination, there is way to exchange information between AP more efficiently.
  + [11-23-0011r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0011-00-0uhr-on-the-enhanced-link-adaptation.pptx) On the enhanced link adaptation Xiaogang Chen (ZEKU)
* C: you talk about open loop, some of the results are based on sounding feedback, which is the closed loop.
* A: Although the STA feedbacks SNR, the AP does not use that for link adaptation.
* C: Based on CSI feedback, the AP may apply inverse water-filling.
* A: We can do offline discussion.
* C: There is CSI feedback, link adaptation using A-control subfield…
* A: this feedback is not usitilized because it is not timely enough.
* C: The rotation matrix is to ensure equal possible SNR. I am not sure there is anything we can do in standardization.
* A: If the STA tells the AP this is the preferred one. If the AP can respect that, it could be helpful.
* C: encourage interperob testing in other organizations.

1. Goals for May 2023

* Technical submissions and discussion on the different PAR KPIs

1. Teleconference/ad-hoc plan

* March 27th 10am-12pm ET
* April 10th 10am-12pm ET
* April 25th 10am-12pm ET

1. Adjourn at 12:30 ET