IEEE P802.11
Wireless LANs

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| 802.11 AMP SG meeting minutes for May 2023 Interim  |
| Date: 2023-5-21 |
| Author(s): |
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Abstract

This document includes minutes of AMP SG Sessions of IEEE May 2023 Interim.

Version Tracking:

R0: Creating the minutes.

# Monday 15 May 2023 @ 10:30-12:30 am ET

## Opening (IEEE 802.11-23/ 0577 r2)

* 1. Call to order 10:30 am ET.
	2. Chair, Bo Sun (Sanechips), instructed members to record attendance in IMAT.
	3. Chair introduced the patent policy and meeting rules (slides 2-8).
	4. No response to the call for patents.
	5. Chair introduced IEEE-SA COPYRIGHT POLICY (slides 9-10)
	6. Chair reviewed other Guidelines, Participation and Guideline for Straw Polls (slides 11-13).
	7. Chair reviewed Suggested Best Practices, Registration, Meeting plan, current AMP SG Session submission list (slides 14-17).
	8. Hao Wang (Tencent) is executive secretary.
	9. Chair call for approval of the agenda of the AMP session.

## Agenda (IEEE 802.11-23/ 0577 r2)

* 1. Chair presented the agenda: https://mentor.ieee.org/802.11/dcn/23/11-23-0577-03-0amp-amp-sg-meeting-agenda-for-may-interim-2023.pptx. (slide 19)
		+ Call meeting to order and remind the group to record attendance on imat.ieee.org
		+ IEEE-SA IPR policies and meeting rules
		+ Approval of agenda
		+ AMP SG kick-off brief and timeline plan
		+ AMP SG leadership election (Vice Chair and Secretary)
		+ Contribution discussion
			- 11-23/0744, WUR applicability for AMP downlink, Amichai Sanderovich (Wiliot)
			- 11-23/0806, par-scope-text, Dave Halasz (Morse Micro)
		+ Any other business?
		+ Recess
	2. No objection, Agenda approved.

## AMP SG Kickoff (IEEE 802.11-23/ 0577 r2)

* 1. Chair presented the AMP SG introduction and time plan.
		+ Comments: suggest to check with WG Chairs to confirm the timeline.
	2. Chair introduced the candidates and run the motion for Vice Chair and Secretary
		+ Motion #1: Approve Steve Shellhammer as the Vice Chair of AMP SG
		+ Moved by Dave Halasz,
		+ Seconded by Weijie Xu
		+ Motion passed with unanimous consent
		+ Motion #2: Approve Hao (Harry) Wang as the Secretary of AMP SG
		+ Moved by Weijie Xu
		+ Seconded by Dave Halasz
		+ Motion passed with unanimous consent

## Contribution discussion

* 1. Presentation of IEEE 802.11-23/0744, WUR applicability for AMP downlink, Amichai Sanderovich (Wiliot)

Q(uestion): Do you think there is a need for an additional radio for DL?

A(nswer): Based on current use case definition, the traffic is low so WUR should be sufficient.

Q: Mixed use of 2.4Ghz and 900Mhz may cause asymmetric for DL and the energizer.

A: Each of the two bands has pros and cons, it may depend on the actual use case to choose. Yes, there is big difference on the link budget and sensitivity of energizing and DL, but the energizer is more flexible and can make it even for the DL.

Q: how do you think the difference between WUR sensitivity and the one of AMP?

A: Consider the implementation and power consumption of AMP, propose to limit the communication range of AMP device. WUR already has L-SIG, we propose to extend the field to achieve better interference protection.

Q: Support to use WUR. Do you think we need to support optional 20MHz mode?

A: No, not for AMP device.

Q: I assume the L-SIG of legacy STA can’t be understood by AMP device, how the AMP device response to L-SIG.

A: The intention is to allow STA near the AMP device to receive L-SIG and avoid interference.

C: AMP device needs to work in standalone mode with single radio, and capable of decoding all types of DL frames. 802.11ah may also be a candidate to work on as AMP radio. -40 for energizer sensitivity is a strict requirement. Agree to consider both 2.4Ghz and 900Mhz for DL.

C: It seems to have multiple options so we need to review the use cases again and come to consensus on the requirements again.

* 1. Presentation of IEEE 802.11-23/0806, par-scope-text, Dave Halasz (Morse Micro):

C: I support to consider 2.4Ghz and Sub 1Ghz band in the standard.

Q: Please clarify the intention, whether to re-use WUR for AMP DL or modify 11ah for DL?

A: Yes, re-use WUR on Sub 1Ghz can be considered in scope.

Q: If use WUR as baseline to design AMP on Sub 1Ghz, AP also needs some modification.

A: Agree, some amendment on 11ba section is needed.

Q: If we agree to design AMP for 900Mhz, the parameters should refer to 11ah?

A: It should be fine.

C: One option is to design a standalone AMP radio based on 11ah, and the second option is to design a secondary radio similar to WUR.

C: We should avoid putting too many contents in the PAR. Re-design WUR for 900Mhz should be discussed in the maintenance group.

## Recess

* 1. The chair announced the session recessed at 12:24 am ET.
	2. Next session will be on May 17th

# Wednesday 17 May 2023 @ 10:30-12:30 am ET

## Opening (IEEE 802.11-23/ 0577 r3)

* 1. Call to order 10:30 pm ET.
	2. Chair, Bo Sun (Sanechips), instructed members to record attendance in IMAT.
	3. Chair introduced the patent policy and meeting rules (slides 2-8).
	4. No response to the call for patents.
	5. Chair introduced IEEE-SA COPYRIGHT POLICY (slides 9-10)
	6. Chair reviewed other Guidelines, Participation and Guideline for Straw Polls (slides 11-13).
	7. Chair reviewed Suggested Best Practices, Registration, Meeting plan, current AMP TIG Session submission list (slides 14-17).
	8. Hao Wang (Tencent) is the secretary.
	9. Chair call for approval of the agenda of the AMP session.

## Agenda (IEEE 802.11-23/ 0577 r3)

* 1. Chair presented the agenda:
		+ Call meeting to order and remind the group to record attendance on imat.ieee.org
		+ IEEE-SA IPR policies and meeting rules
		+ Approval of agenda
		+ Contribution discussion
			- 11-23/0835, Use cases and Requirements, Yinan Qi (OPPO)
			- 11-23/0827, AMP IoT Medium Access, Sebastian Max (Ericsson)
		+ Any other business?
		+ Recess
	2. No objection, Agenda approved.

## Contribution discussion

* 1. Presentation of IEEE 802.11-23/0835, Use cases and Requirements, Yinan Qi (OPPO)

C: Better to transfer the range parameters on slide 6 to dB, also transfer data rate to the amount of data to be transferred. The device ID needs security measurement to avoid tracking.

C: Should relate data rate to range and align with other 802.11 amendment.

Q: How the positioning accuracy requirement is defined?

A: Assume the floor height, just the function not the requirement.

Q: How do you think of the software update of the devices given the current data rate?

A: don’t consider the software update case.

Q: What happened if there are multiple AMP devices deployed in the network, e.g the density of deployment?

A: Agree to define requirement for the density.

Q: Where does the 1mW DL peak power requirement come from?

A: refer to WUR.

C: The AMP device is energy constraint not the power. Suggest to consider legacy 1Mbps in the scope.

Q: It seems not accurate to have one power requirement for all use cases.

A: Actually, the 1mW power limit is already a strict requirement, because AMP device has to do TX and RX within this amount of power.

C: for TX side we need to consider power constraint, but for RX side the energy matters.

C: We may need to classify requirement and use cases.

Q: The data rate is applied to both DL and UL?

A: mainly for UL.

C: If AMP device coexists with legacy 802.11 devices, we need to consider backward compatibility in the PAR.

C: Backward combability means the device can decode legacy 802.11 frames, but we don’t expect AMP tag to do that. In this case, we should consider co-existence in the PAR.

* 1. Presentation of IEEE 802.11-23/0827, AMP IoT Medium Access, Sebastian Max (Ericsson)

Q: let the AP do the contention for the AMP device is something similar to WUR. We can have a AMP sync and data transmission proceeded by legacy preamble. And we can have SP definition for DL and UL lined up by AP and STA. It will reserve the time for AMP devices.

A: Yes, I expect there will be similar design with WUR. But WUR doesn’t have UL transmission. Encapsulation AMP transmission within legacy SP needs AP to reserve the medium. And we will need some mechanism to schedule the wake up period. It needs time sync from the AMP devices. It depends on how much time drift the device has.

C: We should avoid too much modification on the AP. We should avoid OFDM processing.

Q: On slide 3, what is the max length of the AMP transmission?

A: That will be a few milliseconds, it may need higher data rate.

Q: With the FDM method, the motivation is to increase the efficiency?

A: Yes, with given amount of time AP needs to identify as many AMP devices as it can.

Q: If it works on 900Mhz, there will be no OFDM, just a few OOK channels.

A: AP needs to occupy all channel and divide subchannels for AMP devices.

Q: TDM method can also be considered?

A: Yes, there will be other frame exchanges depends on the situation.

Q: You mentioned resources on frequency and time domain, you may as well consider spatial domain.

Q: It will be transparent to the AMP STA?

A: The AMP STA has to provide some indication to the AP.

C: There has to be some mechanism for AP to solicit STA and do protection. If there are multiple data rates, the AP has to select it. And we need to consider discovery issues and duty cycle issues.

C: Good presentation, this is the discussion we need in the study group.

# Thuresday 18 May 2023 @ 13:30-15:30 pm ET

## Opening (IEEE 802.11-23/ 0577 r3)

* 1. Call to order 10:30 pm ET.
	2. Chair, Bo Sun (Sanechips), instructed members to record attendance in IMAT.
	3. Chair introduced the patent policy and meeting rules (slides 2-8).
	4. No response to the call for patents.
	5. Chair introduced IEEE-SA COPYRIGHT POLICY (slides 9-10)
	6. Chair reviewed other Guidelines, Participation and Guideline for Straw Polls (slides 11-13).
	7. Chair reviewed Suggested Best Practices, Registration, Meeting plan, current AMP TIG Session submission list (slides 14-17).
	8. Hao Wang (Tencent) is the secretary.
	9. Chair call for approval of the agenda of the AMP session.

## Agenda (IEEE 802.11-23/ 0577 r3)

* 1. Chair presented the agenda:
		+ Call meeting to order and remind the group to record attendance on imat.ieee.org
		+ IEEE-SA IPR policies and meeting rules
		+ Approval of agenda
		+ Contribution discussion
			- 11-23/0835, Use cases and Requirements, Yinan Qi (OPPO)
			- 11-23/0836, Discussion of Existing Technologies and Technical Challenges in AMP, Weijie Xu (OPPO)
			- 11-23/0837, Discussion on AMP PAR Scope, Yinan Qi (OPPO)
		+ Teleconference Plan
		+ Any other business?
		+ Adjourn
	2. No objection, Agenda approved.

## Contribution discussion

* 1. Update of IEEE 802.11-23/0835, Use cases and Requirements, Yinan Qi (OPPO)

C: Regarding the power consumption of AMP device, define the average power consumption for RX and peak power consumption for TX.

C: Suggest to add use case to the table.

C: Prefer option 2 for device density. Consider separate common requirements and requirement for the special use case.

A: For those AMP devices with capacitor, high peak power consumption may be supported.

C: Suggest to change coverage to link budget and use dB as the metric.

C: Also prefer option 2 for device density. Prefer option 3 for coverage.

C: Option 1 may be suitable for device density because there are limited number of devices. Suggest to use peak power for the power consumption requirements because the average power consumption is related to the duty cycle.

C: Need to clarify the definition of complexity. We need to dive into the details like frame exchange.

* 1. Update of IEEE 802.11-23/0836, Discussion of Existing Technologies and Technical Challenges in AMP, Weijie Xu (OPPO)

Q: On slide 10, not clear about the green field mode, why it is needed? Will AMP device transmit signals with an OFDM preamble?

A: it would be a consideration, the consequence is not clear.

C: There have millions of RFID tags deployed in sub-1Ghz band, 11ah devices are the new comer and should be prepared for the co-existence.

C: If consider 2.4Ghz band tech, it would be necessary to define the backward compatibility in the PAR.

C: For 1Mbps DSSS, most devices have ACR about 50-53dB in 30Mhz away.

* 1. Update of IEEE 802.11-23/0837, Discussion on AMP PAR Scope, Yinan Qi (OPPO)

C: It is necessary to highlight the asymmetric situation for DL and UL in the PAR. Regarding the operation band, suggest to add 2.4Ghz as an option.

C: Suggest to clarify that this standard is aiming for sub-1Ghz and 2.4Ghz, and clarify the power consumption with specific magnitude.

C: Suggest to keep it simple in the PAR, stating the minimum we want to amend to the spec. It will need a serious of standards.

## Teleconference Plan Contribution discussion

Chair announced the following teleconference plan:

* + - May 30, 10:00am, ET; 2 hours, webex
		- Jun 13, 10:00am, ET; 2 hours, webex
		- Jun 27, 10:00am, ET; 2 hours, webex

## Closing

* 1. The chair announced the session adjourned at 15:25 pm ET.