IEEE P802.11
Wireless LANs

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| 802.11 AMP SG meeting minutes for September 2023 Interim  |
| Date: 2023-9-22 |
| Author(s): |
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Abstract

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

Version Tracking:

R0: Creating the minutes.

# Monday 11 September 2023 @ 10:30-12:30 am ET

## Opening (IEEE 802.11-23/1348 r0)

* 1. Call to order 10:00 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 11-14).
	7. Chair reminds the group that this meeting is part of IEEE 802 wireless interim and paid registration is required for attendance.
	8. Chair reviewed the meeting plan during the interim and the submission list (slides 16-18).
	9. Hao Wang (Tencent) is the secretary.
	10. Chair call for approval of the agenda of the AMP session (slide 20).

## Agenda (IEEE 802.11-23/ 1348 r0)

* 1. Chair presented the agenda: https://mentor.ieee.org/802.11/dcn/23/11-23-1348-00-0amp-amp-sg-meeting-agenda-for-sep-interim-2023.pptx. (slides 20)
		+ Call meeting to order and remind the group to record attendance on imat.ieee.org
		+ IEEE-SA IPR policies and meeting rules
		+ Approve meeting agenda
		+ Approve past meeting minutes
		+ AMP SG timeline and progress review
		+ Contribution discussion
			- 11-23/1521, AMP Use Case in Smart Photovoltaics, Shuqiao Chen (Huawei)
			- 11-23/1528, AMP operation @ 2.4 GHz, Weijie Xu (OPPO)
			- 11-23/1529, Summary of AMP SG, Yinan Qi (OPPO)
			- 11-23/1534, Discussion on AMP IoT PAR, You-Wei Chen (MediaTek)
		+ Any other business?
		+ Recess
	2. No objection, Agenda approved.

## Approve past meeting minutes

* 1. Chair reviewed the past meeting minutes for July plenary and August teleconference and run the following motion:

**Motion**: Approve the meeting minutes for AMP SG meetings during 802 Jul plenary session and for AMP SG teleconferences after Jul plenary session/ as below:

* + - [https://mentor.ieee.org/802.11/dcn/23/11-23-1312-00-0amp-802-11-amp-sg-meeting-minutes-for-july-2023-plenary.docx](file:///Users/haowang/Desktop/Work/WLAN/%E9%9B%B6%E5%8A%9F%E8%80%97/-%09https%3A/mentor.ieee.org/802.11/dcn/23/11-23-1312-00-0amp-802-11-amp-sg-meeting-minutes-for-july-2023-plenary.docx)
		- [https://mentor.ieee.org/802.11/dcn/23/11-23-1439-00-0amp-amp-sg-telecon-minutes-august-29th.docx](file:///Users/haowang/Desktop/Work/WLAN/%E9%9B%B6%E5%8A%9F%E8%80%97/-%09https%3A/mentor.ieee.org/802.11/dcn/23/11-23-1439-00-0amp-amp-sg-telecon-minutes-august-29th.docx)

Moved: Harry Hao Wang

Seconded: Weijie Xu

Result: approved unanimously

## AMP SG timeline and progress review

* 1. Chair reviewed the SG timeline plan and progress.

Comment: Suggest to add PAR and CSD discussion to the agenda.

## Contribution discussion

* 1. Presentation of IEEE 802.11-23/1521, AMP Use Case in Smart Photovoltaics, Shuqiao Chen (Huawei)

Q: Why is it necessary to have AMP device for this use case since power is not an issue? 11n seems a better option.

A: The main issue to choose AMP is to reduce cost. The power plant already has IoT device deployed but it is costy. Regarding power harvest, it is not a big issue, PV model may generate power for the device. So the cost is the main issue.

Q: About the parameters, latency is a criticial issue? Device may take actions when received the message as soon as to the network? What is the maximum latency accepted to this use case?

A: We present use cases for the for pretreatment and positioning, For the first one, it is periodic reporting, it doesn’t require much for latency because it’s a daily repairment. For positioning, we don’t emphasize realtime transfer, in PV power plant, it can tolerate 30 minutes latency. Latency is not an important issue.

Q: Slide 6, the readout is once a day? Device text the error message to the gateway, the max latency is 30 min, the readout is 48 message a day? Does it retransmit the message?

A: We don’t expect the AMP device to detect error, because those are simple and small devices. We hope sense data and transmit the data to the server. The server will process the data with some algorithm and detect the error, and transmit back to do positioning or retransmit data. The device doesn’t direct report fault information, so it doesn’t require low latency.

C: Should provide suitable control for AMP device, similar to smart grid use case. For the requirement of positioning, AMP device may transmit at narrow band, so it’s difficult to achieve 1 meter accuracy.

Q: One of the main feature suitable to this use case is the reliability and low maintenance which are characterized by RF energy harvest. No need to get energy from device under monitoring. For devices with battery, maintenance may surpass the additional value. This requirement cannot be met by any other 802.11 device. Question is regarding the data rate, can’t understand the value of 20kbps.

A: The sensing data transmitted to the collector by the AMP could be shorter. It could reach 20 kbps.

* 1. Presentation of IEEE 802.11-23/1528, AMP operation @ 2.4 GHz, Weijie Xu (OPPO)

Q: The energy harvest is depend on implementation, no need to define energy harvest mode in 2.4Ghz band.

A: If not use RF, e.g using soler or heat, it will be an implantation issue. But for RF harvest, we still need to specify the power transfer at sub-1ghz band.

Q: Some slides suggest new PHY waveform? Some slides suggest modified WUR? Please confirm.

A: For mode 1, DL can reuse WUR, the MC-OOK, it’s low power consumption. But for uplink in mode 1, there is demo show possibility to achieve low power on Sub-1Ghz, e.g backscatter for DSSS. But need to consider backward and co-existence, so propose this combination of DL-WUR and UL-DSSS solution. For mode 2, the main radio for AMP STA can use the legacy 11, and use WUR to optimize the power consumption.

Q: Do you want to exclude Sub-1Ghz for DL completely?

A: Because we received concern on 2.4Ghz. I think we already reach consensus for Sub-1Ghz.

Q: Support for 2.4Ghz device makes sense, but Sub-1Ghz DL is also necessary because energizer will be defined at this band.

A: These are example mode to show its possible to achieve target. There will be other modes to discuss.

C: We also need to consider regulations on different band.

Q: Question about the occupation time on 2.4Ghz band, the payload is up to 250bits, in slow transmission mode 50kbps, it will take one device 5ms. If there are 3000 devices, total it will take 15 seconds. It is a lot for the traffic blocking the channel.

A: The max occupation time for a single AMP STA needs to be specified. Based on the use case identified, channel occupation ratio will not be over 0.5%.

Q: 0.5% means 15 seconds over an hour. It’s still not acceptable.

A: Firstly, 3000 devices are not typical for AMP use case. In logistics or warehouse, AMP traffic is dominant so interference will not be an issue. In smart home, the AMP device density is small. Secondly, AMP traffic will be controlled by the AP.

Q: In 2.4Ghz band, AMP only device will have 1mW power consumption, meaning AMP only device can’t use 2.4Ghz for data communicate.

A: At least, AMP assist device in mode 2 can work on 2.4Ghz. But AMP only device in mode 1 is also possible to work on 2.4Ghz. In the DL, modified WUR may achieve lower power consumption by lowering the sensitivity. For the UL, if backscattering of DSSS signal, it will be possible to tens of micro watts. The DSSS active transmitter can also reach hundreds of micro watts. The challenge is to support the generation of 11Mbps spreading code.

Comment: The main concern is on co-existence and interference. For single device, AMP has the smallest interference footprint compared to other devices. There are physical limits on the power supply. In the use case where there are 1000 devices, it is generally in the factory or warehouse and network planning will be done. In these environments, there is clear demand for wireless technologies. If the tech is not done in 802.11, the interference will be the same. It would be better for 802.11 to define the tech and ensures better co-existence.

Q: On side 3, If use mode 1 and transmit 200 bits, how long will it take to finish transmission?

A: For data rate of 1Mbps, it will take 200 microseconds for UL.

Q: I understand you are trying to re-use the existing tech, but it decreases the efficiency. AMP device only has 1mW power budget, better to do it on Sub-1Ghz band. Do you need AMP protocol for both modes?

A: Mode 2 is to connect to the legacy network. We need to optimize the procedure under the limited power budget, for example to optimize the wake up procedure to support battery-less device. MAC and PHY change both needed.

Q: Last slide, third bullet states the negligible impact to the existing standard. Based on the assumptions, the impact maybe negligible, but if a standard is published, people may use it with battery, the impact maybe not negligible.

A: Abuse of a standard cannot be precluded. But for AMP, it would not be efficient to have large payload. Market will do the right decision.

Q: On slide 3, mode 1 uses 2.4Ghz for UL and DL. For RF power transfer on Sub-1Ghz, do you think it needs a spec?

A: It’s open for discussion. The power link would be provided in an on-demand way. AP will schedule the transmission of the power from a third node when there is traffic. This part will need a spec.

Q: Do you need to define power transfer on 2.4Ghz band as well?

A: Need further discussion.

Q: If power is transferred on 2.4Ghz, it will have bigger impact to the existing device.

A: But energy harvest has been developed in recent years. The sensitivity is -20 or -22. But we can achieve the sensitivity at -30 for AMP. It is possible to have AMP harvest energy from beacon. Whether AP on 2.4Ghz need to transmit a dedicated power signal that needs further discussion.

Comment: Some MAC mechanism is missing because unlike standard device being mis-used, there will be MAC approach to limit the channel access. AMP device will not have the independent channel access regardless which PHY waveform is used. In addition, we are concern about the actual impact about the interference and power assumption. Long time transmission is not possible for energy harvest devices. We are having the same objective.

Q: What is the rational to use different waveform for DL and UL for mode 1?

A: Try to re-use the existing tech. 11ba is the most power efficient communication for DL, but OOK is not usable for UL, different waveform is needed for UL.

C: To address concerns, it may help to capture limitations like duty cycle in the PAR. It is also importation to define mandatory mode in the spec. The asymmetric protocol and AP may do a bit heavy lifting in order to reduce the load, these MAC changes need to be highlighted.

C: Some contribution mentioned the long air time. It’s an extreme assumption with high density, and it’s meant to provide theoretical limit. In real case, it can be solved by grouping the devices and avoid transmit at the same time.

C: It makes sense to have two waveforms for DL and UL. Because DL needs to listen all the time, it requires power efficient waveform that is originally designed for WUR. But for UL, it needs a waveform with short duration. That’s why we need spreading and high data rate. For UL, we also need constant envelop for the AMP devices, but OFDM doesn’t have that. And Oscillator is the main driver for power consumption.

## Recess

* 1. The chair announced the session recessed at 12:18 am ET.
	2. Next session will be on September 12th.

# Tuesday 12 September 2023 @ 13:30-15:30 ET

## Opening (IEEE 802.11-23/1348 r1)

* 1. Call to order 13:30 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 11-14).
	7. Chair reminds the group that this meeting is part of IEEE 802 wireless interim and paid registration is required for attendance.
	8. Chair reviewed the meeting plan during the interim and the submission list (slides 16-18).
	9. Hao Wang (Tencent) is the secretary.
	10. Chair call for approval of the agenda of the AMP session (slide 24).

## Agenda (IEEE 802.11-23/ 1348 r1)

* 1. Chair presented the agenda: https://mentor.ieee.org/802.11/dcn/23/11-23-1348-01-0amp-amp-sg-meeting-agenda-for-sep-interim-2023.pptx. (slides 24)
		+ 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
			- 11-23/1529, Summary of AMP SG, Yinan Qi (OPPO)
			- 11-23/1534, Discussion on AMP IoT PAR, You-Wei Chen (MediaTek)
			- 11-23/1601, AMP Communication Channel Usage Estimation, Sebastian Max (Ericsson)
		+ Any other business?
		+ Recess
	2. No objection, Agenda approved.

## Contribution discussion

* 1. Presentation of IEEE 802.11-23/1529, Summary of AMP SG, Yinan Qi (OPPO)

Q: On slide 6, energy impacts the maximum frame size. It’s not enough to say only about the average frame size. If assuming 30 nano joule, it would break the frame size. MAC protocols include not only the data payload, but also the management frame, the latter may have longer frame length.

A: There is interference from outside, please type comments in the chat.

Q: To the slide showing the topology, you mentioned WUR receiver?

A: The direction communication between the STA and AP can use the new interface, one example is DL WUR, the other possibility can be the legacy.

Q: The role of energizer is to send WUR signal to the assisting node to wake the AMP STA?

A: The AP and assisting node is logical, can be in the same device.

Q: The link is asymmetric, the low power transceiver at the STA side may not be so good, the DL could be an issue. The DL may need a relay not the UL.

A: For the UL, the AP receiver sensitivity is better and probably doesn’t need a relay.

Q: You are proposing two modes for 2.4Ghz band, I think it’s not suitable for AMP operating on this band. It will consume more power for the STA. For 11Mbps data rate, it will take several hundred microseconds to send 200 bits. I suggest to move it to Sub-1Ghz and use better waveform. And I suggest to add some restrictions so that people would not abuse it and cause co-existence issues.

A: Fully understand your concern. As we discussed yesterday, the aggregated channel occupancy is less than 0.5%. The impact of AMP is negligible. We can discuss about the restrictions and find consensus.

C: For topology 3, I’d like to add that the relay forward data between AP and STA. The relay may have higher transmission power than the STA, so the link budget for DL and UL may be balanced.

Q: Question on the max payload, 256 bits make the security design hard. NIST already called for SHA 160 bits and the algorithm to be retired completely in 2030. And SHA 256 is used next and its output is already 256. We should consider bigger payload size.

C: We should consider the limitation carefully. We could use the user bits and data bits, and make sure the security is done right. If we want to put in limitations, we should be careful and put it in the rightful position.

A: The payload here is for the information. What you mentioned is the signaling overhead that we will discuss later.

Q: We should take the security issues serious. We should avoid these devices are used for tracking people.

A: Yes, the payload size is for information not for the PPDU. In some contributions, we make some assumptions on the signaling payload. The PPDU size can be doubled.

Q: The energy is limited so it should transfer to the length limit.

A: Yes, energy and power are different concepts. We may consider limit of energy for energy storage.

* 1. Presentation of IEEE 802.11-23/1534, Discussion on AMP IoT PAR, You-Wei Chen (MediaTek)

Q: 11ba is introduced to reduce the latency and balanced the power consumption. One issue is that 11ba is not must-to-have. If regular devices use duty cycle, it will also save power. We are looking at different use cases. For AMP, power harvest is small. With such a power budget, WUR becomes essential part of it. If do power budget computation, you will find that it can’t afford to allow main radio to compete during wakeup and transmit packets. You do need WUR like tech to reduce power and pair the main radio. Regarding the PAR proposal, lets focus on the issues and solutions, rather than adding restriction. If the concern is about potential interference, lets work together to solve the co-existence issue. But draw a line about not doing anything on PHY is not good. The group hasn’t confirmed WUR waveform would work without any change in the use case. For the interference part, AMP device can work in a lot of use cases. If we don’t do it, other tech will do it, so it would be better for 802.11 to make it work.

A: The PAR language is too broad, and it needs to narrow down.

A: 11ba didn’t take off, there are many factors but it’s not the tech issue. If we can’t identify the issue and do 11ba plus, it may suffer the same as before.

Q: I want to discuss the relationship between WUR and AMP. There is power constraint for AMP and we’d like to reuse the existing 802.11 tech. The use case is different, AMP is for IoT services, but WUR is a companion radio. It is too early to say there is no PHY change. There should not be wake up in sub-1Ghz mode. I don’t think AMP is WUR plus.

A: I think we can do more evaluation on the PHY change.

Q: 3GPP also look at the ambient power solution. From a tech gap point of view, it would be better handling the problem in IEEE that ensures the co-existence. Don’t put a lot of restrictions at the beginning. Lets make it open for innovation from the community.

A: We agree to this trend. It’s currently our position. We are not limiting the group but suggest to move the work to Sub-1Ghz band.

C: One of the main reason to use 2.4Ghz band is its ubiquitous present. Let’s not close it from the start.

Q: I am confused by the message. You say 11ba may have issues, but you limit the changes on PHY. Maybe you could name some specific restrictions for discussion.

A: We need to narrow down scope. I think 11ba tech is good, so limiting the PHY modification.

C: My take on 11ba is that the battery operate device vendor has too small voice to drive the requirement into 802.11 market. I think we should be more open-minded with AMP.

Q: I support to exclude energy harvest on 2.4GHz band. If we don’t limit communication on 2.4Ghz band, it may have the same co-existence issue. You should clarify it in the PAR that AMP will leave the minimum interference footprint.

C: I think the AMP device is battery-less and operates in low duty cycle and low output power, so we don’t need to put those restrictions in the PAR. Even if we put in, who is going to check that? No way to enforce it.

Q: It might be reasonable for protection of coexistence but it shall be based on fair principles. We need to analyze how much do we need for protection. It shouldn’t be more specific.

A: I think we have room to discuss. We need more time for analysis.

Q: I have questions on the way forward. We could defer the PAR texts until next meeting. Or we can put something and ask for straw poll.

A (Chair): This group is contribution based. Last session we will discuss the PAR texts. We could setup baseline PAR for motion. Thank you for bringing this up and let the group discuss how to proceed.

Q: I speak in favor of this straw poll because we need to get the senses on where the group is. I don’t think wait for a couple of more months is going to help.

A: I think we need more people to join the group and do some evaluation.

Q: If putting restrictions in the PAR, it will need more time to evaluate. I prefer to keep it open and leave it for later technical discussion.

* 1. Presentation of IEEE 802.11-23/1601, AMP Communication Channel Usage Estimation, Sebastian Max (Ericsson)

Q: I think this is good contribution and express our concern. On slide 10, it’s clear for the impact to the file download service. If it is a latency sensitive service, you will have 0.2 or 0.3 glitch, it will be an user experience issue.

A: This delay is not packet delay. It is the delay of the complete file download. The channel access delay is not delayed by half seconds, rather the max delay is 250 microseconds which is on the order of doing backoff. You can also tune the parameters like setting video to higher access category. It will slow down the AMP transmission but its OK.

Q: What will be the impact for video or audio services?

A: If only the AMP AP can access the medium as here suggested, there will never be an AP which blocks the channel for long time. It will access the channel for small time period and backoff. If you have a audio streaming, it will win most of the backoff.

C: I think 3000 devices for an AMP AP is an extreme case. The reasonable number is 300 or even 100 device per AP.

C: In a use case that has 1000 devices, the interval is once a day or an hour. It’s nowhere near tenth of seconds.

## Recess

* 1. The chair announced the session recessed at 15:30 am ET.
	2. Next session will be on September 13th.

# Wednesday13 September 2023 @ 8:00-10:00 ET

## Opening (IEEE 802.11-23/1348 r2)

* 1. Call to order 8:00 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 11-14).
	7. Chair reminds the group that this meeting is part of IEEE 802 wireless interim and paid registration is required for attendance.
	8. Chair reviewed the meeting plan during the interim and the submission list (slides 16-18).
	9. Hao Wang (Tencent) is the secretary.
	10. Chair call for approval of the agenda of the AMP session (slide 24).

## Agenda (IEEE 802.11-23/ 1348 r2)

* 1. Chair presented the agenda: https://mentor.ieee.org/802.11/dcn/23/11-23-1348-02-0amp-amp-sg-meeting-agenda-for-sep-interim-2023.pptx. (slides 27)
		+ 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
			- 11-23/1596, PHY considerations for AMP devices, Amichai Sanderovich (Wiliot)
		+ PAR (11-23/1006) / CSD (11-23/1212) discussion
		+ Any other business?
		+ Recess
	2. No objection, Agenda approved.

## Contribution discussion

* 1. Presentation of IEEE 802.11-23/1596, PHY considerations for AMP devices, Amichai Sanderovich (Wiliot)

Q: Based on the results, the legacy method is not efficient for AMP design, I’m wondering why are you proposing to use 11b type of signal? It’s not optimized for this type of application. I suggest to design new feature on Sub-1Ghz.

A: I believe the existing waveform can be innovated and maintain to communicate with the legacy, not invent everything from the beginning. No need to stick with DSSS and we can make it simple enough for battery-less. We want the ability of the legacy to receive which is benefit for the market. We believe there is significant room to improve and want to use the existing 2.4Ghz tech. If we start from the scratch, it may be the best, but I’m not sure.

Q: For the DL, you prefer to use the existing tech with software update, but for UL there is no protection?

A: Rely on the legacy for the DL, its strong protection. There is some protection on UL but its lower. We need to analyze how much protection is needed.

Q: What change is needed for UL?

A: CCK can work on 10Mbps, and new preamble. And we need to reduce the size of header.

Q: In some use cases, if you want to develop uplink channel on 2.4Ghz, its not necessary to carry preamble for UL. It’s better to use DL AP for protection, e.g CTS to self.

A: There was a contribution in TIG which suggest to let AP send preamble then STA sends data.

Q: The most energy efficient way is to use backscatter, there are strong advantage to use legacy 1Mbps DSSS waveform for it.

A: Not ruling anything out.

## PAR and CSD discussion

* 1. Discussion of 802.11-23/1006r3, IEEE 802.11 AMP SG proposed PAR, Bo Sun (Sanechips)

C: Consider to use STA instead of device.

C: Difficult to agree on the second and third bullet. Need more time.

C: Suggest to add ‘Any new PHY defined for 2.4Ghz band subject to certain limits’.

C: I have some concerns on ‘at least one mode for energy harvest’. If you want to define it, the new mode should be on Sub-1Ghz.

C: Suggest to replace ‘device’ with ‘STA’. The STA needs compatibility, not the amendment. The AMP STA should be a new STA not the legacy STA with a new mode.

C: Suggest to remove the ‘backward-compatibility’.

C: The bullets on 5.2 should go to 8.1 because it’s the additional information. The scope should include the sentence for co-existence, and the band. Other information should be 8.1.

C: Don’t want to define energizer on 2.4Ghz band, and should clarify the limits on 2.4Ghz operation on duty cycle and such.

C: Suggest to add ‘The communication with AMP STA shall be limited to tbd ms over a period of tbd time.’

C: Make sure that AMP devices work with the legacy is allowed.

C: Concern on the last bullet on the mode of positioning. Please clarify.

C: Current description is broad. We need to couple the last bullets with the prior two bullets. The positioning protocol should be based on the communication protocol.

C: We should start to discuss the tbd items.

C: The goal is to find consensus on baseline texts with tbd items this week. It will not present to the working group for decision.

C: Prefer to use quantitative statement for the tbd items.

## Recess

* 1. The chair announced the session recessed at 15:30 am ET.
	2. Next session will be on September 13th.

# Thursday 14 September 2023 @ 08:00-10:00 ET

## Opening (IEEE 802.11-23/1348 r4)

* 1. Call to order 8:00 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 11-14).
	7. Chair reminds the group that this meeting is part of IEEE 802 wireless interim and paid registration is required for attendance.
	8. Chair reviewed the meeting plan during the interim and the submission list (slides 16-18).
	9. Hao Wang (Tencent) is the secretary.
	10. Chair call for approval of the agenda of the AMP session (slide 24).

## Agenda (IEEE 802.11-23/ 1348 r4)

* 1. Chair presented the agenda: https://mentor.ieee.org/802.11/dcn/23/11-23-1348-04-0amp-amp-sg-meeting-agenda-for-sep-interim-2023.pptx. (slides 29)
		+ 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
			- 11-23/1627, AMP Communication Channel Usage Estimation Part 2: AC\_BK, Sebastian Max (Ericsson)
		+ PAR and CSD baseline draft SG motion
		+ Timeline update
		+ Teleconference Plan
		+ Open discussion on PAR/CSD
		+ Adjourn
	2. No objection, Agenda approved.

## Contribution discussion

* 1. Presentation of IEEE 802.11-23/1627, AMP Communication Channel Usage Estimation Part 2: AC\_BK, Sebastian Max (Ericsson)

Q: Simulation looks good. AC\_BK will be the first limitation to AMP, but its’ not enough. Duty cycle needs to be considered. As the contribution shows, about 30% airtime for the background traffic could be also a problem. There should be some limits on the tx power in case the device is abused on 2.4Ghz band.

A: TXOP limit is already in the standard. The defined value should not be changed. If you want to check the effect, you only need to focus on the upper 30% of the CDF. The download takes 1.4 seconds, meaning in 40 seconds there will be 30 download not affected. The remaining 15 seconds will be interfered. There will be 20% traffic affected by AMP query. We always assume that there is interference on the unlicensed spectrum.

C: Assume there is no other traffic, AMP traffic will take all airtime. It doesn’t make sense to setup limits artificially.

Q: I think 3000 devices are for academic. It’s not feasible for such high density and the actual number should be around 300 devices. In this case, 3% airtime is more reasonable.

C: New metric for limiting the capabilities is difficult to enforce.

C: One flavor is to limit the max payload according to the TXOP duration. The second is to lower the priority of AMP traffic. Current spec provides good framework to ensure there will not be channel halt. Blindly define new rules for AMP is not appropriate.

## PAR and CSD baseline draft SG motion

* 1. Discussion of 802.11-23/1006r3, IEEE 802.11 AMP SG proposed PAR, Bo Sun (Sanechips)

C: Positioning requirement is just use case, should be removed from the PAR.

C: 11az is based on Wi-Fi 6, not sure about the texts.

C: Suggest to define positioning on Sub-1Ghz.

C: Proposed the following texts ‘a mode of positioning protocol using AMP data communication modes’.

C: Positioning is important for AMP. It’s a requirement for half of the total use cases. Need to optimize e.g power consumption for AMP.

C: If the polling for position is too often, it will affect the legacy systems.

C: The position is an on-demand operation. AMP will not do positioning all the time.

C: It’s not clear for the possibility of AMP devices doing positioning. Should bring proof to show feasibility.

C: Positioning requirement has been discussed from the TIG phase.

C: Even for the simple AMP devices, it is feasible to do RSSI based positioning.

C: For Sub-1Ghz band, it may need new method to do positioning. Current texts work for 2.4Ghz only.

C: Against current texts because it’s lack of proof showing the accuracy on 2.4Ghz could meet the requirement (foot level accuracy).

C: The intention is to use existing metrics to do positioning. Current positioning standard is not suitable for AMP.

C: It’s not feasible to use narrow bandwidth signal to achieve high accuracy. Suggest to remove the sentence.

C: Bluetooth can reach good accuracy with 1Mbps signal. AMP devices are supposed to work in near field, so high accuracy of positioning is possible.

C: Suggest to break into two bullets to address the positioning function separately for Sub-1Ghz and 2.4Ghz band.

**[SP#1]** Do you agree to keep the item below in the baseline AMP PAR draft: - [TBD: at least one mode of positioning protocol using AMP data communication mode]

Result: Yes-33, No-40, Abstain-6, SP failed.

**[SP#2]** Do you agree to keep the item below in the baseline AMP PAR draft: - [TBD: at least one mode of positioning protocol in Sub-1Ghz band]

Result: Yes-34, No-39, Abstain-11, SP failed.

**[Motion #1]** Approve the content included in 11-23/1006r3 as the AMP PAR baseline draft for future AMP PAR document development.

*Moved: Weijie Xu*

*Seconded: Rakesh Taori*

*Note: this motion result will not be brought to WG for approval.*

*Result: 61Y/19N/6A, PASSED*

**[Motion #2]** Approve the content included in 11-23/1212r1 as the AMP CSD baseline draft for future AMP CSD document development.

Moved: Weijie Xu

Seconded: Lei Huang

Note: this motion result will not be brought to WG for approval.

Result: Y/N/A, passed with unanimous consensus

## Timeline update

Timeline is postponed, the target is to get PAR and CSD done no later than March 2024.

1. Teleconference Plan

The following two teleconferences are arranged,

Oct 10th, 10:00am, ET; 2 hours, webex

Oct 24th, 10:00am, ET; 2 hours, Webex

## Adjourn

The chair announced the session adjourned at 10:00 am ET.