IEEE P802.11
Wireless LANs

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| Minutes for TGbn MAC Ad-Hoc sessions in July 2024 Plenary |
| Date: 2024-07-14 |
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Abstract

This document contains the meeting minutes for the TGbe MAC ad hoc sessions in July 2024 Plenary.

Revisions:

Rev0: Added the minutes from the MAC ad hoc sessions held in July

Abbreviations:

* C: Comment.
* A: Answer.

# July 15, 2024, AM1 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 08:00 AM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
	* 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r1. The agenda was approved.

**Submissions – Statistics Reporting + Security**

* [24/0519](https://mentor.ieee.org/802.11/dcn/24/11-24-0519-01-00bn-pingpongwarningforuhr.pptx) Ping Pong Warning For UHR Jerome Henry

Discussion:

* One straw poll
	+ C: Appropriate subject for 11bn and the ping-poing issue to be resolved. Slide 4 – clarifying question, which AP is doing this? And does this transcend the mobile AP
	+ A: Not marking any specific AP, as this can happen. But yes this needs to come from ESS level and if the device moves onto another ESS. Cross-ESS is something that needs to be looked at
	+ C: Information such as the BTM status and the RSSI measurements
	+ A: That is correct. STAs can have this, but do not necessarily use it. The STA can make some measurements but it may not be able to get to the required level of certainity
	+ C: Slide 5, one of the parameters a STA can use statistical information in the network
	+ A: The AP can understand if there is any change in the network and the AP can provide direction to the STA
	+ C: If the device is mobile, how will the AP provide this information and how would AP determine if it is because of moving
	+ A: You are right, the AP should not provide until it sees stability of the connection
	+ C: Similar question -how the mobiity effect is considered
	+ A: AP can observe the patterns that may lead to ping-poing. It can say that the pattern happens within the two APs for a specific area
	+ C: AP provides some congestion parameters
	+ A: That is correct. AP can provide what can work, such as a slower scanning interval
	+ **Straw Poll:**
		- 11bn shall support a mechanism to help a STA limit ping pong roaming:
			* 112 votes, Y: 50 (45%), N: 18 (16%), and A: 44 (39%)
			* an additional member who could not vote in time expressed that he supports the SP
* [24/0541](https://mentor.ieee.org/802.11/dcn/24/11-24-0541-00-00bn-ascon-the-lightweight-cryptography-as-a-new-cipher-choice-for-802-11bn.pptx) Ascon: The Lightweight Cryptography As A New Cipher Choice for 802.11bn Hui Luo

Discussion:

* + C: A quick question if this is used a group cipher. You may have mixed network where there are some IOT and regular devices. Do you see ASCON ciphers replace all or some of them
	+ A: What is the difference?
	+ C: The question is if there are in place of or in addition to the existing ciphers
	+ A: Use it as a replacement
	+ C: If you use it as a replacement then you cannot support the legacy devices
	+ A: My assumption is that it will be replacement
	+ C; Understand the improvements
	+ A: Slide 2 shows the benefits and we can discuss further offline
* [24/1034](https://mentor.ieee.org/802.11/dcn/24/11-24-1034-00-00bn-some-thoughts-on-security-enhancement.pptx) Some thoughts on security enhancement Jay Yang

Discussion:

* + C: Can you elaborate how the security features could be brought into .11bn devices and they will not be in synch
	+ A: It is not just for .11bn devices but it could be for some others
	+ C: But that does not prevent the current .11bn enhancements being attacked. I want the group to have a holistic view and for some features the signaling is through the headers and the control frames then how can we protect it
	+ A: But this is also a problem for other features
	+ C: Align with your thinking. It is better to discuss it in WNG and when people can know the scenarios and the security experts can discuss and it is a good proposal
* [24/0543](https://mentor.ieee.org/802.11/dcn/24/11-24-0543-01-00bn-coexistence-protocols-for-uhr-follow-up.pptx) Coexistence Protocols for UHR - follow up Sherief Helwa

Discussion:

* + C: Question on a high-level question on this contribution. You want to cover aperiodic unavailability, but you may also want to cover periodic as well
	+ A: Yes, this contribution covers only the aperiodic; periodic covers some long-term. Here we want to address some unexpected intermittent requirement into consideration
	+ C: Slide 3. Unavailability means the device is doing something else and there is no wi-fi transmission. Another contribution has considered with multiple radios and some sort of multiplexing capability
	+ A: That is somewhat of a different topic. We can discuss it offline to have a smooth operation between the two techniques
	+ C: What would be the ICF in the example in slide 3?
	A: In this contribution, we may need to have the ability to solicit unavailability info
	+ C: IN slide 6, why do you still keep the starting sequence control
	+ A: If you refer slide 7, we can start with having them reserved and then use it for some kind of specific feedback type
	+ C: My point is that we do not have to keep the name and have the information can be provided
	+ A: Yes, we can rename. But in this slide, we were just using the existing name
	+ C: Using ICR and CFR is a passive way of informing, but there will be situations it may be needed
	+ A: This is addressing solicited unavailability info. It is expected that there will be some scenarios where unsolicited unavailability information is provided. We can discuss offline to see if we can define new scenarios that require unsolicited unavailability info
	+ C: The solicited unavailability info is for aperiodic. For an implementation, it is very hard to predict before-hand. Situations where the wi-fi needs to be turned off immediately.
	+ A: Some BT traffic can be predicted and the STA can have some understanding of future unavailability. But without the existence of the feature, the accuracy may not be good enough and there may be collisions and have the mechanism to avoid it.
* [24/0675](https://mentor.ieee.org/802.11/dcn/24/11-24-0675-00-00bn-in-device-co-ex-and-p2p-follow-up.pptx) In-device Co-ex and P2P--Follow up Rubayet Shafin

Discussion:

* + C: Question on SP1, it seems to add to the unavailability poll that happened during previous meeting, but it appears that you are adding one more instance. Can you confirm that you want to add the requests for the TXOP?
	+ A: Yes, I can confirm that
	+ C: This is basically the same as the SP ran last time and on top of it adding this case.
	+ A: Same line as Laurent’s question. We agree with the first two bullets, but we think additional information is needed and otherwise it is an incomplete straw poll
	+ C: Do you want to consider other STA interferers, say a BT transmission may interfere with others.

The session was recessed at 10:00 AM

# July 15, 2024, PM2 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 04:00 PM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
	* 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r4. The agenda with modifications was approved.

**Straw Polls (30 mins)**

* Straw Poll 3: Do you agree to define mechanisms that enable APs operating on the same channel to coordinate their respective rTWT schedules and/or to ensure that one AP extends the protection of the rTWT schedule of the other AP.
	+ NOTE – TBD mechanisms including negotiation between 2 APs and advertisement.
* **Result: 150 votes caste. Y: 53%, N: 23% A: 24%**

**Submissions – Coexistence Part 2**

* [24/0676](https://mentor.ieee.org/802.11/dcn/24/11-24-0676-00-00bn-peer-to-peer-twt-for-handling-co-ex-p2p.pptx) Peer-to-peer TWT for Handling Co-ex/P2P Rubayet Shafin

Discussion:

* + C: The idea of client requesting time and the AP suggesting a channel and there is a value to it. On slide 3, during the unavailability period the STAs are expected to be unavailable or sometimes they may be available
	+ A: The STA is saying that may become available and the AP may say that it may not satisfy its QoS. AP in its response it can provide that indication
	+ C: Accountng for the timing drift makes sense
	+ C: Slide 4 and 5, the claim is the current capabilities of individual TWT will not be able to use for unavailability because of mismatch. But the granularity can be as low a 1 us
	+ A: If you run for 4 minutes, what do you think would be the drift?
	+ C: If you run for that long, can you not have indication
	+ A: This is not a new problem. In the base standard, there is flexible TWT. All I want to say is that we want to extend flexible TWT to P2P case
	+ C: On enhancement 1, would it be sufficient to create a new TWT instead of using the old one
	+ A: But you don’t want to go through the entire breaking and setting up
	+ C: But flexible TWT also need management frames
	+ A: Only one
	+ C: But creating a new TWT should also work. Correct?
	+ A: It should work
	+ C: On enhancement 2, clarification
	+ A: AP is saying to use the gratuitous channel. But it will be gone and I would like some indication from the AP on the best channel that can be used by the STA. If you have pattern A, go to BSS X, but with pattern B, perhaps BSS X may not be the best and may be better to use BSS Y. It is still a recommendation after the unavailability has been indicated
	+ C: Is the intention to communicate with the AP or the peer STA?
	+ A: Both – indicate unavailability to the AP and find a good channel to park
	+ C: Slide 4 – on TWT interval units, can you clarify on what you mean by lack of granularity?
	+ A: You have a P2P arrival traffic start time. You set up your unavailability very close to this start time, but there may be gap between the two and this gap may be tolerable for hundreds of SPs but with time the gap widens significantly. So, the actual unavailability time may be different to the indicated unavailability time
	+ C: Agree that we should have such mechanism to correct the drift. Slide 7, unavalability schedule modification can be done through management frames
	+ A: This is not for immediate adaptation
* [24/0831](https://mentor.ieee.org/802.11/dcn/24/11-24-0831-00-00bn-periodic-idc-use-cases-and-considerations-for-signaling.pptx) Periodic IDC use cases and considerations for signaling Hongwon Lee

Discussion

* + SP1 is being scheduled to be run on Wednesday
	+ C: If you read the SP text as is, it is already possible with the baseline spec. What specific changes do you suggest on the top of the baseline
	+ A: I do not understand but at a high level since we don’t have anything on IDC feature, so I would like to run this
	+ C: Baseline P2p has this exact issue discussed
	+ C: Slide 5. What you are saying that BT is always more important than Wi-Fi, but this is not always the case, for example playing something off the internet to ear buds. The SP should focus on how we can improve P2P already in the base. Prefer upgrading the existing P2P
	+ C: What is the difference between P2P TWT and yours?
	+ A: We will need additional information to improve and need further discussion
	+ C: Since BT and Wi-Fi share the same resource there cannot be partial unavailability since the other technology will be shut down
	+ A: when the antenna is shared then there will be partial unavailability
	+ A: On bandwidth in 5 GHz, it is possible a subchannel can be used
	+ C: Slide 10, there should be a negotiation for IDC, as the WFA should not have lower priority compared to BLE all the time. So, why use announcement
	+ A: Announcement only because the STA has to be unavailable
	+ C: There should be acknowledgement
	+ A: Yes: Frame acknowledge may be sufficient
	+ C: slide 10, agree with other commenters it cannot be unsolicited and there should be acknowledgement or negotiation
* [24/0834](https://mentor.ieee.org/802.11/dcn/24/11-24-0834-00-00bn-some-details-on-in-device-coexistence.pptx) Some Details on In-Device Coexistence Insun Jang

Discussion

* + C: Is there another possibility other than using Multi-SA BA as an option?
	+ A: Another option could be an action frame. However, it is easier to extend BA frame using STA info.
	+ C: Yes, defining a new management frame is worse. But is there any space in BSR?
	+ A: No, there is not enough time in A-Control if you have BSR
* [24/0857](https://mentor.ieee.org/802.11/dcn/24/11-24-0857-00-00bn-icr-consideration.pptx) ICR consideration Liwen Chu
	+ Discussion
	+ C: What do you mean using Multi-STA BA for ICR? There will be an ICR that will solicit this Multi-STA BA for ICF?
	+ A: Yes, there would be new ICF
	+ C: What would be the nature of the ICF?
	+ A: It would be in another contribution
	+ C: There is a lot of information on signaling. But this contribution does not show usecase etc. Do you have a follow up to go with this?
	+ A: There are several contributions that talk about ICF/ICR
	+ C: ICF is used for signaling, but purpose of ICR is not clear
	+ A: This straw poll only deals with the contents of the ICR
	+ C: Slide 2, you mention in-device interference co-existence, power save low-capacity listening mode. Do you want to have a single way of being able to do these things?
	+ A: I have a contribution for low-power mode to high-power mode transition etc.

The session was recessed at 5:50 PM

# July 16, 2024, PM1 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 01:30 PM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
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		+ 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r5. The agenda was approved.

**Straw Polls (30 mins)**

* + SP #3 would be deferred to a subsequent session
	+ **Straw Poll 1:** Do you agree to add the following to the 11bn SFD
		- In 802.11bn, the event that triggers switching to the NPCA primary channel shall be
			* OBSS Control frame exchange (e.g., (MU-)RTS/CTS) or
			* OBSS HE/EHT/UHR PPDU

Discussion:

* + - C: In the first bullet, you mention an OBSS control frame exchange the STA may switch to NPCA
		- A: Yes
		- C; What if the STA receives the RTS and not the CTS?
		- A: If you receive the RTS, the responses need to be defined, just the concept
		- C: If you receive one of them you can switch to NPCA primary channel. Is that correct?
		- A: Yes
		- C: For the second bullet, you limit the PPDU type to HE or later, but based on the current rules in the standard, STA can detect HT as well, so I would not like to limit the PPDU type at this point and recommend it.
		- A: Starting from HE, it is very clear on the PPDUs. If we want to include HT, we are ok to include them
		- C: This is an important issue on when to switch. There are several contributions on when to switch. So, it is too early to decide to when to switch. Also, if we see the text, there is not sufficient detail. On the first bullet, when will the transmission happen? And on the second one, I am not sure when to switch
		- A: If we want to see the entire protocol, we have contributions. That discussion is not part of it, we just want to talk abot the control-frame exchange and some PPDUs. If the group determines the pre-HE PPDU then we can add the note
		- C: We have concern to the SP text. Would vote no unless shall is changed to may and also extend to other events
		- A: Understood
		- C: For the second bullet, same concern as previously expressed. I do not see any contribution/explanation to understand the intention. Deleting the second bullet would help.
		- A: Undersand the first question. Make it TBD.
		- C: I would like to remove.
		- A: There wa a contribution presented in the last meeting which explains why we limit to HE-PPDU and later PPDUs
		- C: Is it possible for the non-Wi-Fi signal to use this?
		- A: If it is non-Wi-Fi, there is no way to determine how long it will last
		- C: If a PPDU is received with error how that would work?
		- A: You need to have at least sufficient detail to be able to use this
		- C: Agree with previous concerns. There are many other contributions that have other information
		- A: Yes, but this SP is not the full text for NPCA
		- C: First bullet is from MAC stand point of view but the second bullet it is not clear why this is limited. Also, I have a contribution that is related to this issue. It would be good to listen to that contribution and run for the straw poll
		- A: Document 11-24/495 explains all this
		- C: For the first bullet, we can detect whether the PPDU is from OBSS. For a scheduled event, do we do this kind of NPCA? Can we predict at that time?
		- A: We can add other conditions
		- C: Question on SP #2
		- A: Come back later
		- C: “shall” may be stronger. Do we consider CTS-self or the bandwidth signaling
		- A: Modify the question to the following:
		- In 802.11bn, the following events trigger switching to the NPCA primary channel
			* OBSS Control frame exchange (e.g., (MU-)RTS/CTS) or
			* OBSS HE/EHT/UHR PPDU
			* other conditions or triggers (other PPDU types, ...) TBD
		- C: speak in favor
		- C: This is essentially having AP and STA sides decide on their own and really there is no coordination from the AP side. AP and STA may see different channel conditions, there will be deployment issues and we will need more discussion on this is the way
		- A: This is not the entire detail. There will be additional conditions and they are going to be building on top of it.
		- C: I understand but this is one condition, but there are othrs.
		- A: We can put instead of “other” with “additional” conditions
		- C: We will need more discussions
		- A: Understand that we will need more discussion, but run the straw poll
			* C: Speak in favor
		- Modified straw poll:
			* In 802.11bn, the following events trigger switching to the NPCA primary channel
				+ OBSS Control frame exchange (e.g., (MU-)RTS/CTS) or
				+ OBSS HE/EHT/UHR PPDU
				+ other conditions or triggers (other PPDU types, ...) TBD
			* **Result**
				+ Total votes: 196 in slidio
				+ Y: 48%, N:33% and A: 19%
				+ Additional votes in the chat window: Y:2, N:12
				+ Final Result: Y: 96, N: 77, A: 38
	+ **Straw Poll #2:** Do you agree to add the following to the 11bn SFD
		- In 802.11bn, the NPCA operation shall use the same EDCA parameters ((MU) EDCA Parameter Set, EPCS EDCA Parameters), on both the BSS primary channel and the NPCA primary channel.

Discussion

* + - C: Is it the just the parameters or also backoff values
		- A: Just the parameter set
		- **Result:**
			* Total votes: 186 in slidio
			* Y: 86, N: 54, A: 50

**Submissions – Coexistence Part 3**

* [24/0856](https://mentor.ieee.org/802.11/dcn/24/11-24-0856-00-00bn-further-discussions-on-in-device-coexistence.pptx) Further Discussions on In-Device Coexistence Jeongki Kim
* Discussion:
	+ No strawpoll
	+ C: You have the unavailable. When do you expect the coex event would end?
	+ A: There are several. The value could be set to a maximum value. The actual data transmission during the event can be finished
	+ C: Slide 7, if the STA said that it is busy for a specific duration, it is not appropriate for the AP to send anything at that time. Is it?
	+ A: Depending on the application/traffic (such as urgent or low-latency) to be transmitted to the STA, then the AP may be doing it to satisfy the delay bound
	+ Q: I can see it working well in some situations but not so in others.
	+ A: In this I am assuming the ICF is very small and if the STA cannot decode the ICF and will not transmit the ICR then the AP knows that the STA is not available
	+ C: Regarding the time remaining in the figure on slide 7, do you consider the remaining time as available or unavailable?
	+ A: In this example, the remaining time is unavailable. It is the detail that we need more discussion
	+ C: The direction is good. My clarification question, as a station, I have already indicated unavailability, then I would not be available. If you go to slide 6, if the STA is available then it should be indicating that the STA has resumed its unavailability. But Slide 7 has its own disadvantages and will lead to inefficiency. Slide 6 is more reasonable
	+ A: Yes, both options will have tradeoffs, but we have to consider these as well. Continue the discussion.
	+ C: Slide 6, what is the assumption in having UL frame and LL data? Are they SIFS separated?
	+ A: Need more discussion. If the frame is like PS-Poll, then the LL Data can transmit after SIFS after PS-Poll. APSD also supports with QoS Null. For other frames, they could be different
	+ C: May be better to have more than SIFS as the AP may be occupied with some other things
	+ C: In this slide, the assertion is that the AP has LL data for STA. In your proposal, it is reasonable that the STA after finishing coex event, sends an UL frame as the AP may not send until the period of unavailability (and also that the STA does not know if the AP has LL data)
	+ A: By sending a short frame, the STA can determine if there is data. In that point second part is better. In that sense option 2 is better, but there are tradeoffs with both approaches
* [24/1108](https://mentor.ieee.org/802.11/dcn/24/11-24-1108-00-00bn-periodic-idc-signaling-for-mobile-ap.pptx) Periodic IDC signaling for Mobile AP Hongwon Lee

Discussion:

* + C: This falls into periodic AP power saving. Essentially you are saying how an AP says that it will be gone. Isnt that the essense of AP Power saving
	+ A: Yes, I will think about it
	+ C: This solution is not to legacy stations and UHR stations. If the AP contains their IDC information, are you sure that there are no compatibility issues with broadcoast TWT
	+ A: We have the IDC size to accommodate the legacy. So, we will have backward compatibility
	+ C: On slide 9, you say IDC + persistence. Can you elaborate on persistence?
	+ A: This is based on BT status, but this is just an example and we can work on the details
	+ C: It somehow seems to assume that IDC signal is of more importance than the Wi-Fi signal
	+ A: I don’t really think that coexistence signal itself is more important but this is the way to control the status in the device, also to protect other technology and also to avoid double punishment to wi-fi signal
	+ C: this seems to indicate that wi-fi signal should be deferred and wait
	+ A: Yes, because sending the wi-fi signal will not really help and at least avoid that kind of situation
	+ C: I support the idea with the existing mechanism so that we can signal the period of unavailability. You mentioned that this is for mobile AP. Do you think that the rules should be such that they are different for mobile AP and infrastructure AP?
	+ A: We did not assume for infrastructure AP as the number of STAs will be large and there will be additional issues and we have to focus on them. For now, we are limiting to Mobile AP.
* [24/0806](https://mentor.ieee.org/802.11/dcn/24/11-24-0806-00-00bn-multi-link-in-device-coexistence-management.pptx) Multi-link In-device Coexistence Management Juseong Moon
	+ Discussion
	+ C: Why do you think that ever link should have unavailability period?
	+ A: Every link should have the unavailability period
	+ C: Is this for AP scheduling?
	+ C: Take it offline
* [24/1109](https://mentor.ieee.org/802.11/dcn/24/11-24-1109-00-00bn-more-consideration-for-in-device-coexistence.pptx) More consideration for in-device-coexistence Hongwon Lee

Discussion

* + C: Do you have real-life values for clock drift?
	+ A: I don’t have any number at this point. I will need to find them, but we think this is a possible scenario
	+ C: Slide 7, the second unavailable time can be considered an aperiodic IDC and can be indicated through multi-STA BA as in other contributions. Is there any reason to indicated the periodic change at this point?
	+ A: Because we have to distinguish the original IDC event and the second one and that is why I put this
	+ C: Expectation on how frequently this timing information is updated. If it is not too frequent and it will defeat the purpose of the periodic unavailability
	+ A: Depends on the scenario, but I do not have any numbers. Not only the clock but also IDC
	+ C: Where do you think you will include these indications
	+ A: We are thinking of trigger frame and have a new action frame
	+ C: To send IDC request, the STA has to know if the synchronization is valid or not
	+ A: It is the same procedure and if they are misaligned then they can be updated. Sometimes it may be like TSF timer adjustment
	+ C: Will the STA send a request?
	+ A: In our contribution we are considering the update but we will need to discuss further
	+ C: So you mean that through beacon or something the STA can use to send a request
	+ (Ran out of time)

The session was recessed at 03:30 PM

# July 17, 2024, AM1 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 08:00 AM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
	* 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r6. The agenda was approved.
* **Straw Polls (30 mins)**
	+ Straw Poll 1: Do you support to define in 11bn that a non-AP MLD can gather information on candidate AP MLD(s) over the DS via the current AP MLD?
	+ Supporting list: [24/0349r3, 24/0679r1]

Discussion

* + - C: It looks a general straw poll text. Clarify the text on what information that is being expected and what is the purpose of the text? It looks like for seamless roaming. If so, why not mention it?
		- A: The purpose is for the non-AP roaming MLD set up from the current AP to the target AP. Just want to make some progress, we want to keep it general for now
		- C: For roaming or others like multi-AP
		- A: Only for roaming scenario
		- C: There are mechanism that allow the current MLDs. The text here is different from what is agreed offline.
		- For second straw poll, there are other presntation and we need more discussion
		- **Result**
			* Total votes: 187 in slidio
			* Y:125, N:34, and A: 38
	+ Straw Poll 2: Do you support to define in 11bn that a non-AP MLD sets up one or more links with target AP MLD over the DS via the current AP MLD?
	+ Supporting list: [24/0349r3, 24/0679r1]

Discussion

* + - C: Setting up links over the DS. Only two documents listed and there are other documents with other concepts. Additional scenarios can be considered and would like to work offline and come up with a new text
		- A: Setting target link over the air is already in the baseline. We are trying to define what is needed in .11bn
		- C: The seamless roaming and target AP is not supported in the base standard and we think that we need to cover in the sP
		- C: It is not clear how the client will set up one or more link over DS. Probably we need some further discussion on SP2?
		- C; Suggest modifying “sets up” to “may set up”
		- A: Yes, accept that change
		- C: Either we defer or make a small change to
			* Do you support to define a mechanism in 11bn that a non-AP MLD may request seting up one or more links with target AP MLD via the current AP MLD?
		- A: I would like to keep the “over the DS”. Suggest add to the end of the text “via DS”
		- C: Instead of current AP to serving AP
		- C: Suggest removing “over the DS” and add “or via the target AP MLD”
		- A: No to above changes
		- C: Isnt “via the target AP MLD” same as what is baseline?
		- Further modification suggested has not been accepted
		- **Modified SP:** Do you support to define in 11bn that a non-AP MLD may request setting up one or more links with target AP MLD via the serving AP MLD over the DS or through the target AP MLD?
		- **Result**
			* Total votes: 208 in slidio, 7 in chat, 215 in total
			* Y:120, N:47, and A: 48
* **Straw Poll 3**: Do you support to define in 11bn that when a non-AP MLD is in the process of roaming from the current AP MLD to a target AP MLD, the context related to the non-AP MLD is transferred to the target AP MLD such that it preserves the data exchange context for the non-AP MLD or the context can be renegotiated with the target AP MLD?
	+ Details on what context can be transferred and what context can be renegotiated are TBD
	+ How to transfer the context is TBD.
	+ Supporting list: [23/1971, 23/1996, 24/0052, 24/0083, 24/0101, 24/0396, 24/0412, 24/0679]

Discussion

* + C: Remove target AP MLD as it is not needed
	+ A: It was put in there to ensure that it is clear. Would like to keep it for now
	+ C: Speak in favor of this as there have been good amount of discussion
	+ C: Isnt the “or the context can be renegotiated with the target AP MLD” – isn’t this in baseline, why do you need?
	+ A: just to let people know that there are two cases
	+ C: can you add “as in baseline”
	+ A: does not make much difference. Can we discuss it further? Doesn’t look like there i a technical concern
	+ C: but it is already in the baseline.
	+ A: It looks like there is no technical concern. And the SP has been discussed for a long time so would not like to change at this late stage. Would like to discuss further.
	+ C: Same concern as Peshal. As the mechanism exists there may not be necessary
	+ A: Discussion with others felt that context switch needs to be done
	+ C: It may not be exactly like in baseline as some context may be transferred and some it can be renegotiated and would like to keep as is
	+ C: May be no need for “context can be renegotiated with the target AP MLD” as the first bullet addresses it and will be comfortable with the way it is
	+ A: the text that is already there has been discussed and would not like to change
	+ **Result**
		- Total votes: 206 in slidio, 6 in chat, 212 in total
		- Y:153, N:22, and A: 37 (6 Yes from chat)

**Submissions – Power Save Part 1**

* [24/0450](https://mentor.ieee.org/802.11/dcn/24/11-24-0450-00-00bn-a-proposal-for-uhr-soft-ap-power-save.pptx) A Proposal for UHR Soft-AP Power Save Neel Krishnan

Discussion

* + C: If the ICF is lost will the STA understand that the AP has not received in which case with lower power the tx will be long leading to more consumption
	+ A: Yes, frames can always collide but that should not affect
	+ C: Can you provide some measurements on the savings?
	+ A: Yes
	+ C: In non-greenfield how does it work for pre-association for legacy stations
	+ A: Nothing can be done but AP Should be able to decode them, the only failure is the ACK failure and it will be ok after some time
	+ C: You are saying that you the ack will be successful in likely 3rd or much more?
	+ A: Yes
	+ C: It is not clear where the power gains come? Arent the power gains coming from the listen power mode reduction
	+ Y: Yes, all are for using for lower power
	+ C: So the change of the modes should be indicated
	+ A: Done in beacons and such
	+ C: From your contribution it seems like you want to make it mandatory. This needs to be debated?
	+ A: Yes
	+ C: Either you need green field or doesn’t work in legacy. Like having transmit available
	+ A: There may be several levels of power saving
	+ C: Slide 7, there will not be too many unicast frames, so does it make sense accommodate broadcast frames?
	+ A: For association request, you would still need unicast frames
	+ C: On the performance results in slide 9, how much the results accommodate the “no tx” capability
	+ A: In reference 6, there is data with and without tx, we used that data
	+ C: You may want to compare benefits and such for legacy etc
	+ C: You position this for mobile AP. If things move along, normal AP should be able to adopt it
	+ A: Yes, it depends on how much the legacy behavior would be there
* [24/0589](https://mentor.ieee.org/802.11/dcn/24/11-24-0589-00-00bn-dynamic-tid-to-link-mapping-for-ap-mld-power-save.pptx) Dynamic TID-To-Link Mapping for AP MLD Power Save Yongsen Ma
	+ C: Can the operating mode of the AP can be different for each STA, based on the result of the TTLM negotiation?
	+ A: The TTLM itself may not address operating moe
	+ C: Can the AP do an individual negotiation or just announcement for all STAs?
	+ C: AP can ust announce or negotiate
* [24/0602](https://mentor.ieee.org/802.11/dcn/24/11-24-0602-00-00bn-multi-link-power-management-for-mlo.pptx) Multi link Power Management for MLO Morteza Mehrnoush
	+ C: Could you explain the motivation or reason or the usecases for the schedule start time and duration. Initially the issue was about the delay. Would there be a need for start time and duration?
	+ A: Having a set time is better than just not indicating as it will be deterministic from AP MLD point of view
	+ C: Is the underlying assumption that the APs will have delays and they will be static and they have to be exposed to everyone? It is a dynamically changing based on the internal operation of the AP.
	+ A; The intention is if the AP can provide a maximum value in all cases.
* The session was recessed at 10:00 AM

# July 17, 2024, PM1 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 1:30 PM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
	* 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r7. The agenda was approved.
* **Straw Polls (30 mins)**
	+ **Straw Poll 1:** Do you agree that as part of the seamless roaming procedure, during roaming,
		- after the request/response exchange that initiates notification of the DS mapping change from the current AP MLD to the target AP MLD,
			* The current AP MLD may deliver buffered DL data frames for a TBD period of time.
			* The non-AP MLD may retrieve buffered DL data frames from the current AP MLD
			* The non-AP MLD may send UL data to target AP MLD.
			* It is assumed that the target AP MLD is able to deliver data frames to non-AP MLD after the DS mapping change
		- The current AP MLD may forward DL data to the target AP MLD.
			* When and how to initiate the forwarding of DL data is TBD
		- Supporting list: [23/1971](https://mentor.ieee.org/802.11/dcn/23/11-23-1971-02-00bn-further-thoughts-on-seamless-roaming.pptx), [23/1996](https://mentor.ieee.org/802.11/dcn/23/11-23-1996-00-00bn-improve-roaming-between-mlds.pptx), [24/0052](https://mentor.ieee.org/802.11/dcn/24/11-24-0052-00-00bn-seamless-roaming-details.pptx), [24/0083](https://mentor.ieee.org/802.11/dcn/24/11-24-0083-01-00bn-smooth-roaming-follow-up-2.pptx), [24/0101](https://mentor.ieee.org/802.11/dcn/24/11-24-0101-03-00bn-mld-roaming.pptx), [24/0396](https://mentor.ieee.org/802.11/dcn/24/11-24-0396-01-00bn-seamless-roaming-within-a-mobility-domain-follow-up.pptx), [24/0412](https://mentor.ieee.org/802.11/dcn/24/11-24-0412-01-00bn-seamless-roaming-procedure-follow-up.pptx), [24/0679](https://mentor.ieee.org/802.11/dcn/24/11-24-0679-00-00bn-thoughts-on-functionality-and-security-architecture-for-uhr-seamless-roaming.pptx)]

Discussion

* + C: What is this request/response exchange between who & who?
	+ A: At this time, we are not specifying the signaling field. This is needed for DS mapping change, but we are not having anything on signalling
	+ **Result**
		- Total votes: 173 in slidio, 6 in chat, 179 in total
		- Y:136, N:11, and A: 32 (6 Yes from chat)
* **Straw Poll not run**
* **Straw Poll 3:** Do you agree to include the following into the 11bn SFD?
	+ 11bn defines a mechanism to allow a non-AP STA to indicate a periodic unavailability in time to its associated AP
	+ Note: Some harmonization based on [[24/0831](https://mentor.ieee.org/802.11/dcn/24/11-24-0831-00-00bn-periodic-idc-use-cases-and-considerations-for-signaling.pptx), [23/0816](https://mentor.ieee.org/802.11/dcn/23/11-23-0816-01-0uhr-enhancements-for-latency-sensitive-traffic-and-in-device-coexistence.pptx), [23/1934,](https://mentor.ieee.org/802.11/dcn/23/11-23-1934-00-00bn-in-device-interference-mitigation-follow-up.pptx)[23/2002](https://mentor.ieee.org/802.11/dcn/23/11-23-2002-02-00bn-in-device-coexistence-and-interference-follow-up.pptx), [23/2078](https://mentor.ieee.org/802.11/dcn/23/11-23-2078-05-00bn-coex-enhancement-for-xr-use-cases.pptx), [24/0420](https://mentor.ieee.org/802.11/dcn/24/11-24-0420-02-00bn-enabling-flexible-coexistence-operation.pptx)]

Discussion

* + C: TWT is already there, why do we need another mechanism?
	+ A: We want to be open to new possibilities
	+ C: Do you have any definition of unavailability or is there partial availability where you can have Wi-Fi transmisisons
	+ A: Those are the details that we will work on thims
	+ C: What is the difference between Power Save and unavailability
	+ A: there is no specific case and can be applied to others
	+ C: Is this for not only time-domain or frequency-domain
	+ A: Yes, but this is a high-level mechanism and we can work on details
	+ C: It is very strange that you have only time-domain and not frequency-domain
	+ A: It is not my intention to limit
	+ C: Then you can add then
	+ A: But there are others who may disagree and would like to keep the SP as is?
	+ C: Some of it is already in baseline. We should have a discussion on what needs to be ehanced and then bring a straw poll
	+ A: We will need more discussion but it is important to have a high-level direction
	+ C: This is a no op straw poll. But there is already a mechanism that addressed new issues/ideas instead of repeating the legacy ideas
	+ C: Similar comment
	+ C: Need definition of unavailability and what it means before we run the straw poll
	+ Straw Poll being run:
	+ **Result**
		- Total votes: 185 in slidio, 8 in chat, 193 in total
		- Y:92, N:63, and A: 38 (8 Yes from chat)

**Submissions**

* [24/0659](https://mentor.ieee.org/802.11/dcn/24/11-24-0659-01-00bn-thoughts-on-ap-power-save.pptx) Thoughts on AP Power Save Binita Gupta
	+ C: Slide 5, can you elaborate on AP budget negotiated with the switch
	+ A: Every AP is connected over PoE, there is a budget for the AP
	+ C: Is the switch a physical device
	+ A: Yes
	+ C: Many points that have been expressed are applicable to residential APs as well. Slide 9, it is good for the schedule announcement. But isnt it more useful in RNR as well? It is more generic
	+ A: I agree that having in RNR is also useful even though RNR has limited capabilities
	+ C: This AP Power Save mechanism is an MLD level feature. It seems to me that this should be a link level mode. For example, going from low power to high power or low MCS mode are link-based parameters, so this should be per link announcement
	+ A: Agree that some are per-link but it can also be announce in ML element using Per STA profile using cross-link announcement
	+ C: But cross-link announcement is not MLD level
	+ A: Take it offline
	+ C: In the current AP Power Save mechanisms discussed, they all have start time and duration and periodicity are being discussed. Are you aligned with that or do you think additional items including having elements carrying these parameters?
	+ A: Algined with that, but have these in beacon and probe responses to be both at the AP level and the MLD level and regardless of the state the STA will get the information
	+ C: The information will change from time to time and this means the STA has to consume updates. What is the recommended update period?
	+ A: Varies on the different cases. Depends on deployment. Like critical update, anytime there is an update
	+ C: The mechanisms you mentioned that are already there in the legacy such as BTM. Those already influence STA behavior. What is it to influence the STA behavior?
	+ A: BTM does not provide any schedule for power save. But BTM is unicast and cannot be used and we will need the announcement
	+ C: Does it make a difference if the STA needs to know in advance or immediately, and if so how does it matter?
	+ A: But it may not. For shorter durations, the STA may not change the link. If there are other links active as well, the STA may not change
	+ C: In this contribution, there are lot of concepts are supported by existing methods there are some new. It is good to have a wishlist, but we also need a careful consideration and understan the gains and complexities
	+ C: You talk about preferred links for operations in Straw Poll 2. In .11be, there is multi-link TIM, there is a bitmap, there is a recommendation already. Is this in that direction?
	+ A: This preference is sent from non-AP STA to the AP
	+ C: We already have power save mechanisms in .11be such as link disablement. I think one link would operate on legacy and others. In turns of the power consumption, compared to the overhead and complexity, is it going to be worth putting some links in power save
	+ A: You could achieve some good amount of power save. There may be scenarios when AP MLDs are completely shut down.
* [24/0671](https://mentor.ieee.org/802.11/dcn/24/11-24-0671-00-00bn-enhancements-on-ap-power-save.pptx) Enhancements on AP Power Save Shawn Kim

Discussion:

* + C: Slide 7, when the AP is operating in the low-capability mode, there has been no mention of any limitation mentioned to the STA, why would the STA not transmit?
	+ A: If the AP wants to transmit 20 MHz a single stream, the STA may transmit
	+ C: Wouldnt it be better for the STA to transmit at low-capability mode instead of waiting for the ICR frames that would say transition are actually transmitted?
	+ A: No, since devices are in low capability the STAs will be able to receive them
	+ Run SP1
	+ **Straw Poll:** **Do you support to define a power save mode for an UHR AP wherein the AP transitions between lower and higher capability modes following TBD conditions?**
		- Lower capability mode (e.g., 20 MHz BW, one SS, limited data rates, etc.)
		- Higher capability mode (e.g., parameters advertised in Capability/Operation elements, OM Control, etc.)
		- Conditions for transition are TBD
	+ Discussion:
		- C: There was a motion that was already run on AP changing capabilities. What is the new thing that you are adding here
		- A: The original one was for Mobile AP and non-AP STA
		- C: For this AP power save mechanism there are several mechanisms, it may be better to define the modes and decide
		- A: We can have other modes.
	+ **Result**
		- **Total votes: 162 in slidio, 7 in chat, 193 in total**
		- **Y:60, N:57, and A: 52 (7 No from chat)**
* [24/0694](https://mentor.ieee.org/802.11/dcn/24/11-24-0694-00-00bn-cross-link-ps-state-indication.pptx) Cross-link PS state indication Vishnu Ratnam

Discussion

* + Slide 4, what is the behavior expected from the AP since the PS-Poll as the STA continues to be in PM
	+ A: Yes, depends on if it is legacy or U-APSD. If it is legacy no further transmission by AP, but if it is U-APSD then it will continue to send until PS to end
	+ C: There was a SP that passed in Denver. Is it the same mechanism or is it an additional mechanism?
	+ A: this is being built on top of it by changing the subtype
	+ C: the goal here is to use for PS-Poll and U-APSD trigger, for either? How much is the utilization of the cross-link PS-Poll as if you use PS-Poll it is not efficient.
	+ A: The advantage is that the STA can avoid NAVsync delay as it sends PS-Poll on link 1 will allow the use of link 2 without the NAVsync delay
	+ C: It would be very inefficient for PS-Poll. But the U-APSD will need additional signaling
	+ A: Discuss it offline
	+ C: It looks like the main focus is U-APSD
	+ Y: I have shown that there is some optimization for U-APSD to avoid the NAVsync and then also terminate the SP without explicit
	+ C: Do you expect the AP to serve as soon as PS-Poll is sent?
	+ A: Expect some delay

The session recessed at 3:24 PM

# July 17, 2024, PM2 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex teleconference system and physically in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 4:00 PM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
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		+ 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r8. The agenda was approved.
* **Straw Polls (30 mins)**
	+ Straw Poll: Do you support to use M-STA BA for Initial Control Response frame (ICR) for DL and UL, at least when carrying feedbacks (i.e. unavailability feedback)?

Discussion

* + - C: This was presented only yesterday and would require some time to look at it. It was stated that there was another contribution and another design consideration that needs to be looked at
		- A: This is different. This contribution has been there for several months
		- C: Very similar comment and we need more time to study
		- C: Speak in support, even though not all scenarios are considered
	+ **Result:**
		- Total votes: 151 in slidio, 2 in chat, 193 in total
		- Y:79, N:513, and A: 21 (2 No in chat)
* **Presentations**
	+ [24/0715](https://mentor.ieee.org/802.11/dcn/24/11-24-0715-01-00bn-multi-link-sm-power-save-mode-follow-up.pptx) Multi-Link-SM-Power-Save-Mode-follow-up Jason Y. Guo

Discussion:

* C: Slide 6, step 1, (missed the question – audio wasn’t clear)
* A: It is the initial set up the candidate set of links to be used in this mode
* C: Since you set up the primary link, can the primary link change during that association, because the AP may disable that link in some situations
* A: Yes, the primary link may change if the AP changes the primary link.
* C: If we want to go in this direction, there should be protocols to change the primary link
* A: Yes
* C: How does the AP MLD know that the other links are available? Is the idea is to win the contention on non-primary channel and then use ICF?
* A: It depends on the implementation. It may choose to go there if the other channels are expected to be free
* C: Similar question if the AP is getting access of multiple links, will there be alignment of transmisisons. What happens the client chooses multiple links
* A: It means that the client is ready to receive on multiple links then the AP can transmit in those links
* C: trying to understand if there needs to be alignment based on STR or non-STR
* A: if it is STR, there is no issue. If it is NSTR it should follow the rules in baseline
* C: (Lost connection) – questions on using NSTR
* C: Similar questions on NSTR
* C: Moved to offline discussion
	+ [24/0737](https://mentor.ieee.org/802.11/dcn/24/11-24-0737-00-00bn-cross-link-wake-up-to-go-deeper-in-power-save.pptx) Cross-link Wake-up to Go Deeper in Power Save Yuxin Lu
		- Not available to present
	+ [24/0782](https://mentor.ieee.org/802.11/dcn/24/11-24-0782-01-00bn-ap-power-saving.pptx)AP power savingChaoming Luo
		- Not availale to present
	+ [24/0813](https://mentor.ieee.org/802.11/dcn/24/11-24-0813-00-00bn-discussions-on-ap-power-save.pptx) Discussions on AP Power Save Yongsen Ma

Discussion

* + - C: If there is any indication by the STA, the AP will have a final say.
		- A: Yes, the negotiation will lead to it.
		- C: This are requirements but not clear on how it will reflect in the spec
		- A: Should work on the details
		- C: Side 9, is the request for the AP to follow or not follow. Can you elaborate?
		- C: The requests are coming from the STA. The AP can use it as one input in making its decision
		- A: Yes
		- C: Is the request shown here, is it same as presence? Are they the same thing or two different things?
		- A: They are different purposes. The first one is long term and the second is short term request
		- C: slide 10, you have some existing procedures. Are you talking about some new proposals? If you are recommending new ones, then you have to study and determine the positives and news?
		- A: Goal is to understand and study the existing procedures and the extensions and if they have further issues
	+ [24/0833](https://mentor.ieee.org/802.11/dcn/24/11-24-0833-00-00bn-dynamic-power-saving-for-ap.pptx) Dynamic Power Saving for AP GeonHwan Kim

Discussion:

* + - C: Regarding option 2, if the AP is operating lower-capability isn’t it a downgrade to legacy stations?
		- A: Yes, that will affect the legacy stations and we may have to find some solutions. Another option is to change the low-capability state but if there are several legacy stations, then it can update or may be consider other options
		- C: I would say that option 2 is better. We want to ensure that legacy STAs are supported on the same link. It is better than option 1. Even if you have one link, it would be good to support legacy STAs.
		- C: You want to indicate the bandwidth of the low-capability in the operational element and the high-capability in new development element. But since other devices in other BSS should be able to understand it is better to have the high-capability in the operational element.
		- C: Since you are transmitting in the low-power mode, the transmission will be longer, would we achieve any power saving?
		- A: If there are lot of legacy STAs are associated and will end up using more power. Then perhaps it can increase its capability to high-capaility mode
		- C: Slide 4, after ICF/ICR, you are using 20 MHz, 1 SS, is this how it should be?
		- A: Meant to say increase the bandwidth and the number of spatial streams
		- C: Slide 6, for non-DPS supporting STAs, what is the need for initiating frame and responding frame?
		- A: It is not necessary but trying to align with ICF/ICR
		- C: But this may not be necessary and STAs are not expecting to respond to these frames
		- A: But this can be RTS/CTS frame
	+ [24/0844](https://mentor.ieee.org/802.11/dcn/24/11-24-0844-00-00bn-padding-time-in-dynamic-power-save.pptx) Padding Time in Dynamic Power Save Maolin Zhang
		- Not available to present
	+ [24/1126](https://mentor.ieee.org/802.11/dcn/24/11-24-1126-00-00bn-icf-icr-discussion-for-dps.pptx) ICF-ICR Discussion for DPS GeonHwan Kim

Discussion

* + - C: I understand from the analysis, would a new control frame would be your choice?
		- A: It seems all the members want to use the existing frame. The existing frames could be useful but may need modifications
		- C: If you have new design, does it make sense there is no worry for backward compatibility?
		- A: Yes
		- C: What are O and X?
		- A: O is available and X is unavailable

The session recessed at 15:59 PM

# July 18, 2024, AM1 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 08:00 AM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
	* 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r9. The agenda was approved.
* **Straw Polls (30 mins)**
	+ Do you agree 11bn should define a MAP coordination operation procedure?
		- Note1: The coordination operation procedure may include the procedures for discovery of other coordinating APs ' features, parameter negotiation for MAP co-ordinations, etc.
		- Note2: the mandatory or optional steps are TBD.
		- Support contribution lists: [24/453r0, 24/719r0, 23/1871r2, 22/1515r0,24/84r1, 24/511r0]

Discussion:

* C: There are many proposals on MAP coordination scheme. Each scheme will have discovery procedure, paramters. We don’t have any thing in the SFD and we would like to have this to move forward. Socialized the idea with others and hope to get group’s support
* C: This is a bit premature and we have not approved anything so far and we should go in the right order and should have at least two other CAP schemes approved before getting to this
* A: We will need to have coordination
* C: But we do not have any CAP schemes
* A: There are other contributions
* C: Still it is short of design and has a should
* A: Remove the should
* C: Some editorial suggestions: instead of operation procedure, have a framework. Using procedure twice
* A: There are no procedures, only framework. Changing all operations to framework
* New Text: Do you agree that 11bn defines a MAP coordination framework

Note1: The coordination framework may include the procedures for discovery of other coordination APs features, parameter, negotiation for MAP co-ordinatess, etc.

Note 2: the mandatory or optional steps are TBD

* C: Agree with the other commentor. Too early for this as we need to consider other cases/scenarios
* A: those can be worked upon
* C: the mapping is not clear. Also, same concerns as others as the schemes are not defined. It is a bit early for the group to consider
* A: There are some general procedures for discovery and negotiation and that is why the terms procedure is there
* C: For this straw poll, it is not clear what is being voted upon. It implies that there are no procedures. Also mandatory/optional are TBD. Request this to be deferred
* A: OK, agree to defer it.
	+ **SP**
		- **Straw Poll 2: Do you support defining the following fields for unavailability indication in M-STA BA frames:**
			* **An Unavailability Target Start Time field defined as the TSF time at which the STA becomes unavailable (duration and resolution TBD, expectation is to use a portion of the TSF)**
			* **An Unavailability Duration field defined as the time during which the STA is unavailable (field may be not present or set to an unknown value)**

Discussion:

* + - The proposer has walked through the SP
	+ C: Is this your intent to be mandatory
	+ A: My intention is to be mandatory. Is your intention that the STA should not be able to respond with unavailability information
	+ C: I value the direction
	+ C: You are using BA frame as the initial response frame
	+ A: (missed due to connectivity issues)
	+ C: Request to defer
	+ A: I would like to run the SP
	+ C: I speak in favor of the strawpoll. Yesterday’s SP failed, I trust this is for ICR but it could be used for other cases. The baseline already supports the frame exchange and using multi-STA BA is natural
	+ C: We still need some more discussion for multi-STA BA. It is not clear from the SP whether the AP or the STA are both are sending. Request to defer
	+ A: It allows for both AP and STA allowing the multi-STA BA. Can I defer to AM2?
	+ Chair: Need to request the TG chair and see if he can accommodate. It is a question of if you want to defer, we cannot guarantee its running.
	+ A: Request the chair to defer for both SP2 and SP3
	+ C: I want IDC to be such that high priority wi-fi traffic is not stuck behind other low priority traffic
	+ A: I sympathize with the intention, but it is orthogonal to this general capability
	+ [24/0504](https://mentor.ieee.org/802.11/dcn/24/11-24-0504-00-00bn-considerations-of-a-unified-initial-control-frame-design.pptx) Considerations of A Unified Initial Control Frame Design Hanqing Lou

Discussion

* + - C: Good effort to summarize requirements for different modes. For several of these modes, some other things are also coming into picture, before/after, for features such as DSO, with CFO etc. Do you think one solution can cover all of these
		- A: That is correct. There could be modes which can handle this
		- C: The question is more on transmission regulatory requirements
		- A: That is true, but we should still be able to define modes
		- C: Slide 9, you presented 3 options. Do you have any opinion or preference?
		- A: My preference is the last two. Reusing existing frames, there will be issues with not enough fields/bits
		- C: I have a question on unsolicited ICF (slide 6). I am not sure unsolicited control frame.
		- A: There may be a need due to the IDC event
		- C: My understanding is that unsolicited signaling is not for frame exchange but one direction
		- Yes
		- C: From the design it seems information is sent through ICF or ICR
		- A: Yes
		- C: spec for static and dynamic puncturing. Why do you need something new? We aready have it in .11be and I think it is good enough.
		- A: If you recall, during 11be there were several contributions, the only choice is to reduce bandwidth and not to use multiple channels with multiple puncturing holes. In that case the existing .11be case is restricted.
		- C: Ok but this needs to carefully considered and OFDMA can be used
		- A: The OFDMA is pretty expansive but non-OFDMA is just 5-bit
	+ [24/0505](https://mentor.ieee.org/802.11/dcn/24/11-24-0505-00-00bn-considerations-of-transmissions-of-initial-control-response-frames.pptx) Considerations of Transmissions of Initial Control Response frames Hanqing Lou

Discussion

* + - No discussion
	+ [24/0629](https://mentor.ieee.org/802.11/dcn/24/11-24-0629-00-00bn-ul-low-latency-traffic-indication.pptx) UL Low Latency Traffic Indication Xiaofei Wang

Discussion

* + - C: This is an important topic and important direction. It is also vital not to rely on distributed way of indication. But is the goal for indication for uplink traffic, do you assume that the devices do not set up SCS?
		- A: This would be complementary to SCS. You could let AP know that QoS requirements but there could unpredictable traffic and aperiodic which makes UL MU transmisisons better
		- C: Did you consider BSR? Why is NFR better than BSR?
		- A: The BSR will have a similar functionality. But for NFR, the overhead is much lower as you don’t send PHY header and it is much easier to signal without sending the entire buffer status
		- C: Eventually for UL transmission, how much buffer is there and how to assign the resource? Maybe making some enhancement on BSR. There are other improvements if we consider NFR. We could consider NFR for some pre-emption
		- A: I agree. All those things can be incorporated, what types of triggering and buffer sizing. There are definite benefits for BSR but there are efficiency benefits with NFR
		- C: How to handle control frame protection with NFR?
		- A: Need to think through but not sure how much protection do you need for one bit. But I did not consier this aspect and need to be thought.
		- C: This direction for industrial automation and robotics with many low-latency traffic. NFR so far is not for low-latency and if there is an UHR STA, but if the 11ax STA uses NFR how will an UHR will recognize the difference
		- A: We can discuss options
		- C: Slide 6, option 2. It involves multiple priorities. How is it determined? Priority or SCS
		- A: These needs to be determined and open to anything that can indicate.
		- C: Is there any specific definition for low-latency traffic and also how to prevent non-STA not indicating the priority maliciously
		- A: There have been attempts on low-latency in the past and we continue to work on it so that there is a clear definition. Malicious indication is a possibility then the AP implementation should likely handle it, by not scheduling them.
		- C: We should assign AIDs of STAs with low-latency traffic close to each other. But low-latency is dynamic so how would one do it?
		- A: There are multiple options. Perhaps AIDs change may not be practical but there could be options and the AP may attempt to allocate close to each other
		- C: I would suggest use a specific value to address random access which will pick up the RU.
		- A: Let us take it offline
		- **SP: Do you agree that the NDP feedback report mechanism should be considered for UL low latenc traffic indication in 802.11bn**
			* Result
				+ 159 in slidio, 1 inchat
				+ Y; 65, N: 65, 30 abstain (1 Yes in chat)

The session recessed at 9:58 AM

# July 18, 2024, AM2 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using webex and in Montreal, Quebec, Canada (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 10:31 AM. The Chair introduces himself and the Secretary.
2. The Chair reminded the members that they need to register for the plenary in order to attend the meeting.
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
	1. Nobody responds.
4. The Chair goes through the IEEE copyright policy.
5. The Chair recommends using IMAT for recording the attendance.
	* 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
	* If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang (Xiaofei.Wang@InterDigital.com), Jeongki Kim (jeongki.kim.ieee@gmail.com) and Srinivas Kandala (srini.k1@samsung.com)
6. The Chair asked whether there is comment about agenda in 11-23/0976r10. The agenda was approved.
* **Straw Polls (30 mins)**
	+ All SPs in the agenda document are deferred due to lack of consensus. Two new straw polls are being added, shown below.
	+ SP1: Do you support to include in the 11bn SFD:
		- define a mechanism for a non-AP STA to report unavailability at TxOP level and define or reuse existing mechanism for a non-AP STA to report long term (periodic) unavailability?
		- Supporting list [[24/0831](https://mentor.ieee.org/802.11/dcn/24/11-24-0831-00-00bn-periodic-idc-use-cases-and-considerations-for-signaling.pptx), [23/0816](https://mentor.ieee.org/802.11/dcn/23/11-23-0816-01-0uhr-enhancements-for-latency-sensitive-traffic-and-in-device-coexistence.pptx), [23/1934,](https://mentor.ieee.org/802.11/dcn/23/11-23-1934-00-00bn-in-device-interference-mitigation-follow-up.pptx) [23/2002](https://mentor.ieee.org/802.11/dcn/23/11-23-2002-02-00bn-in-device-coexistence-and-interference-follow-up.pptx), [23/2078](https://mentor.ieee.org/802.11/dcn/23/11-23-2078-05-00bn-coex-enhancement-for-xr-use-cases.pptx), [24/0420](https://mentor.ieee.org/802.11/dcn/24/11-24-0420-02-00bn-enabling-flexible-coexistence-operation.pptx)]
	+ Discussion
		- Several SPs were run and this captures the consensus in the meeting. Two mechanisms captured in the SP
		- C: Generally supportive. What is the existing mechanism that you would be using
		- A: P2P update
		- C: I want a minor update. The numbers that are there in P2P TWT with 256 us which is unachievable. So, can we say reuse/update?
		- SP reworded:
		- Better concern. It is important for helping clients, but it is not clear that it is helping Wi-Fi. I would like thsi to be complemented with duck and weave and should not allow high-priority Wi-Fi traffic should not yield to low-priority other technology traffic
		- C: Agree with the comments. There are many other that needs to be forthcoming but support this
		- C: I also echo above comments that talks about protecting high-priority Wi-Fi traffic. However, for long term (periodic) unavailability? But it will have to compense for unlicensed band. Wi-Fi will always defer when there is an activity and it is not convincing how Wi-Fi will overcome it.
		- A: The periodicity may be unusable but for all other cases it would work
		- C: There could be short-term or long term? Can you elaborate?
		- A: We will discuss this in the next level of detail
		- C: Is it the complete list of the supporting documents?
		- A: There may be some others. What is the process if there are other documents. If there are some, and if the contribution is supporting this SP, please send email to Laurent to add to the motion
		- C: For long term, having periodicity, periodic unavailabiltiy can affect Wi-Fi. Can we replace ”report” to ”neogitate”
		- A; That would be next steps
		- C: The way it is worded right now, there is no option for the AP just to accept
		- C: What does periodic in paranthessis mean?
		- Reworded poll:
		- Do you support to include in the 11bn SFD:
			* Define a mechanism for a non-AP STA to report unavailability at TXOP level and define or reuse/updating existing mechanism for a non-AP STA to report long term (periodic) unavailability
			* Result: 215 total votes in slido, 6 in chat, total 221
			* Y:164, N: 24, A: 33 (6 yes in chat)
	+ SP2: Do you support to include in the 11bn SFD:
		- Define a multi-AP Coordinated Spatial Reuse at TxOP-level with power control
		- Define multi-AP Coordinated Beamforming
		- Supporting list: [23/325r0, 23/1917r0, 22/1822r0, 24/577r0, 23/1037r0, 23/1023r2, 24/529r0, 23/1832r0, 23/776r1, 24/1211r1, 24/839r1, 24/0635r0, 24/0639r0, 24/0880r0, 24/1204r0,]

Discussion

* + - C: This has been discussed for a long time and time to run the straw poll
		- C: I support this direction but I request to a joint meeting as there should be PHY expertise should voice
		- A: This is more like MAC than PHY and include PHY people in off-line discussion. The text doesnt touch much of the details and they appear to be accept it
		- C: Support it as hoping to make progress in multi-ap
		- C: Can you had ”other MAP schemes TBD”? Can we have wording to state that it does not preclude other MAP schemes
		- A: Yes, adding the note ”Note: whether to define other Multi-AP coordination modes is TBD”
		- C: Also speak in favor of the mechanism
		- C: Have the extra text as sub-bullet
		- C: Regarding the first bullet, in the previous meeting a member commented that with CSR we cannot achieve without power control and that whether we need power control or not. But you have it already
		- A: There are many contributions with power control. Including it will improve the performance. Also, power control is essential to CSR
		- Reworded text:
	+ SP2: Do you support to include in the 11bn SFD:
		- Define a multi-AP Coordinated Spatial Reuse at TxOP-level with power control
		- Define multi-AP Coordinated Beamforming
		- Other Multi-AP coordination modes are TBD
	+ Result: 215 in slidio, 7 in chat, total 222
	+ Y: 173, N: 27 and A: 28
* [24/1156](https://mentor.ieee.org/802.11/dcn/24/11-24-1156-00-00bn-initial-control-frame-exchange-for-low-latency.pptx) Initial Control Frame Exchange for Low Latency Sanghyun Kim

Discussion

* + C: I have a concern that the AP not responding to the ICF from legacy. The legacy may be sending an ICF but AP not responding to it.
	+ A: We can use the strategy like in .11be
	+ C: How do you handle the LL traffic arriving after ICF/ICR exchange.
	+ A: There are some contributions considering the preemption case, not in this contribution. Discuss it offline
* [24/1195](https://mentor.ieee.org/802.11/dcn/24/11-24-1195-00-00bn-indication-techniques-for-urgent-traffic.pptx) Indication Techniques for Urgent Traffic Jinho Choi

Discussion

* + C: Slide 6, when the AP is associated with many STAs, the conditions for collisions will be increased. How many STAs should be specified to overcome this issue
	+ A: That is why we made this proposal. If there are several STAs, how to set the conditions to get an acceptable level. By setting appropriate conditions, the AP can control the level of collisions.
	+ C: Slide 6, for low-latency traffic, the main criteria you choose delay. If you have a class of HMD they all will have the same requirements. In that case, there will be many collisions. How will you solve?
	+ A: As I said, the residual delay is an example. But different criteria can be used and the AP can provide these. In this example, there are two conditions, AP can set condition 1 and AP can set condition 2 on a different criteria
	+ C: I understand that, but in some scenarios, we should consider this and we need to solve how to handle these situations
	+ C: BSRP has a limited number of reserved bits, Do you have an opinion that how to indicate that conditions for RA-RUs in BSRP TF?
	+ A: There is not enough room to provide conditions in detail. If we want to use BSRP with UORA, we should define pre-defined conditions, we should limit the number of things
	+ C: Would the baseline NFRP is a good candidate
	+ A: It is a good candidate but right now it can deliver limited information. The way of indication of the STAs also need to be addressed to get some flexibility. But we should think whether we should update/modify the new scheme
	+ C: How many levels of conditions would be workable to make it practical
	+ A: Do not have the exact answer. It depends on BSS conditions or the implementation of the AP
	+ C: The problem is that we need to define and may either end up with collisions or having large number of collisions
* [24/0636](https://mentor.ieee.org/802.11/dcn/24/11-24-0636-00-00bn-multi-ap-preemption-for-low-latency-traffic.pptx) Multi-AP Preemption for Low-Latency Traffic Si-Chan Noh

Discussion

* + C: Premepiton will make the protocol complicated with C-TDMA
	+ A: If the C-TDMA is for periodic traffic, by using the multi-AP coordination, we can provide a solution
	+ C: As for the scenarios, it would be more important to be simple; such as shared or sharing and there will be less complications
	+ A: Yes, I agree
	+ C: Similar concerns on how to balance. Multi-AP Prememption can be considered for the next generation
	+ C: Slide 7, what is the value of this, in C-TDMA, the sharing AP would be scheduling and we are adding another tool to shared AP
	+ A: In the case of TXOP holder is an AP, STA can do preempt. But LL traffic can happen and I want to cover in multi-AP.
	+ C: The C-TDMA itself has BSRP type of transmissions to the sharing AP and that will resolve this problem
	+ A: Yes
	+ C: It was very inspiring to see the whole solution space and intrigued of extending the preemption of multi-AP. Do you have any plans to study further as we need to understand the solution space? Are you planning some evaluation and understand how this mechanism can become beneficial.
	+ A: If we design other cases with the periodic traffic, we should still think about how to support low-latency traffic
* [24/0804](https://mentor.ieee.org/802.11/dcn/24/11-24-0804-00-00bn-the-transmission-of-preemption-request-frame.pptx) The transmission of preemption request frame Yunbo Li
	+ C: In the two options that you have, the other STAs observing the PPDU will send the PR?
	+ A: Yes, it is
	+ C: How do you handle the collision request
	+ A: All of them have the same content; so no collision
	+ C: How do you identify the STAs
	+ A: Use UORA
	+ C: What is the case for when you have PPDU, SIFS, PR, SIFS and control response?
	+ A: In the uplink case, there is no issue since AP clearly knows that there is a response frame. For downlink case, the STA may not know if there is a collison due to hidden node
	+ C: Discuss offline
	+ C: Slide 3, the solution earlier was elegant. The PR collision itself will be ok since AP can control it and the only issue is the length of the response frame
	+ A: The key issue is the length of the response frame. Suboptimal solution of the STA allows then there may be better
	+ C: Discuss further offline
	+ C: slide 2, verify that PR sent by the STA2 and STA3 are the same. These could be different in other proposals
	+ A: In our proposal, it is the same content. Having a different content is possible

The session adjourned for 12:31 PM

**References:**