IEEE P802.11  
Wireless LANs

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| Minutes for TGbn MAC Ad-Hoc sessions in January 2024 Plenary | | | | |
| Date: YYYY-MM-DD | | | | |
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Abstract

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

Revisions:

* Rev0: Added the minutes from the MAC ad hoc sessions held on January 16 & 17
* Rev1: Added the minutes from the MAC ad hoc session held on January 18
* Rev2: Clean up and fixing typos

# January 16, 2024, AM1 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex and in Panama City, Panama (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](mailto:Xiaofei.Wang@InterDigital.com)), Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com)) and Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com))
6. The Chair asked whether there is comment about agenda in 11-23/2174r6. The agenda was approved.

**Submissions - Misc. & QoS**

1. [23/1834](https://mentor.ieee.org/802.11/dcn/23/11-23-1834-00-00bn-high-criticality-use-cases-and-requirements.pptx) High Criticality Use Cases and Requirements Iñaki Val Beitia (MaxLinear)

Discussion:

* No questions

1. [23/1873](https://mentor.ieee.org/802.11/dcn/23/11-23-1873-00-00bn-post-fcs-mac-padding.pptx) Post-FCS MAC Padding Sindhu Verma (Broadcom)

Discussion:

* SP offered on slide #12 but will not be run today
* C: Appears to be reasonable but practically will be sent at a low rate. Will there be false positives or can it be ignored?
* A: As long as there is a requirement to pass FCS, then it needs to be fulfilled as there could be reason for the FCS
* C: Can the devices process in the middle of the PPDU just like implementations do for beacons
* A: It would be good for the FCS be done before MAC padding as if there is an FCS error, the device needs to track back and not to switch.
* C: Is there any additional processing requirement will increase the time or can remove the dummy user to avoid padding
* A: That is possible
* C: Then what kind of frame would be used
* A: Repurpose the last user info field for new FCS
* C: Can do this without trigger frame?
* A: For non-trigger frame, there could be a field that is not decodable by legacy but can be specific to UHR devices
* A: MAC padding does increase the padding requirement
* C: Can we do away with legacy FCS?
* A: We still need FCS because we want to avoid legacy devices go into EIFS mode
* C: Clarificaiton may be required for which frames will need and whether it would be post-FCS MAC padding
* A: Yes, the intention is to have these padding, but will be clarified
* C: Maynot be critical for EMLSR and EMLMR, so for new mechanisms, why not remove the requirement that the frames should be non-HT duplicate frames and take advantage of other frame formats
* A: Right now there are no other frame formats that enables devices to read a 20 MHz in a 320 MHz bandwidth. The non-HT duplicate frame is the only one that can be used at this time
* A: For EMLSR, it is an architectural issue and a 20 MHz radio still has to decode the frame fully
* C: will take offline on the formats, how many Post-FCS paddings will be there
* A: right now will be one
* C: Presentation is missing the fields in header and footer and the chair requests the author to update the presentation

1. [23/1958](https://mentor.ieee.org/802.11/dcn/23/11-23-1958-00-00bn-proxy-qos-management-for-xr-use-cases.pptx) QoS Proxy for XR Use Cases Guoqing Li (Meta)

Discussion:

* C: Slide 3: How would the device knows its peer is doing? How does the security aspect works
* A: TDLS has some related functions, but need to study the security aspect
* C: Is there any performance analysis on the impact of this mechanism
* A: The performance improvement would be similar to using QoS Characteristic in .11be. The signaling between .11bn AP and .11bn STA
* C: Is there internet traffic move to the compute device and what is the impact
* A: this proposal is not moving internet traffic
* C: Slide 5: Device ID needs to be included. The commentator says that the corresponding SCS ID should have device ID. That means that you will only need one bit that it is a proxy bit information
* A: Yes, some indication is needed, one bit or more if necessary
* C:Do you want to improve the legacy device performance
* A: Yes, he goal is to improve for legacy device; including say .11ac device, which does not have too many features
* (Points to the figure in slide 3, where one of the devices is a legacy device)
* C: How does the AP know the relation between an XR device and a remote compute device
* A: AP has to be Tgbn capable. Has to have security information that can be applied on top of the legacy device
* C: Which device has the internet connection
* A: In this topology, internet is not required
* C: Will the remote device directly or through a relay function in AP
* A: Yes, it could communicate directly, but this presentation doesnot address the case and the remote device will not have a direct connection with XR device. There are several variations on how this is exercised
* C: You are thinking of having many legacy devices with Tgbn. You appear to be referring to Wi-Fi 6 and not Wi-Fi 7
* A: Yes, include Wi-Fi 7, but would be able to support legacy devices
* C: Devices get updated all the time
* A: Not necessarily, there are laptops that use old versions
* A: Different devices are bought at different times and may not have the same abilities
* C: Isnt SCS supported in Wi-Fi 6?
* A: It may be but they are optional in both Wi-Fi 7 and Wi-Fi 6
* C: How will the application run on two devices
* A: The SW built is by one vendor on both XR and the remote device
* C: How does the layer 2 and layer 3 information is conveyed
* A: the expectation is that the XR device will understand the characteristics of the data between the AP and the remote compute device
* C: How does the AP know when it should be enabled and not as it is bound to be abused. Some level of paring and authorization may be required
* A: Agreed
* C: Do you have something in this presentation
* A: Needs to be worked
* C: AP needs to know the MAC address of the legacy device
* A: From XR Device or potentially through conversion
* C: Is there any requirement of which generation on the remote legacy device
* A: There is no expected requirement on the legacy device
* C: If the remote is a Wi-Fi 6 devices, the HMD may not know the capabilities of the legacy, the AP may not be able to apply it
* A: Answer that is correct
* C: If thee are multiple HMDs are connected to the same compute device how does it work?
* A: Needs to be thought. But imagine that it would be traffic-flow based and have algorithms to combine and have admission control

1. [23/1885](https://mentor.ieee.org/802.11/dcn/23/11-23-1885-00-00bn-end-to-end-qos-with-scs.pptx) End-to-end QoS with SCS Duncan Ho (Qualcomm)

Discussion:

* + C: Are all the devices on the same WLAN/VLAN?
  + A: Associated with the same AP/BSS
  + C: Requesting clarification on device B role in slide 5. Why cannot Device B, being .11bn and above, why could it not set it?
  + A: Yes, there coud be different configurations. In this, we don’t rely on Device B setting up, but if it does have all the capabilities, it can set it up.
  + C: Slide 4. In this presentation device B is expected to support .11bn. But in case it does not support .11bn, then the device may not understand the QoS characteristics and may be mixing with all the frames in the uplink direction and may not be effective for uplink
  + A: It could send using proper AC
  + C: that may not be sufficient
  + A: That is a good point
  + C: what about both devices or set ti up?
  + A: I will think about the race condition
  + C: Does your proposal support pre-be devices
  + A: IT supports .11be and .11bn
  + C: Can this be generalized (optimized?) with the device A sets it up by requesting for device B
  + A: discuss offline
  + C: The use case is that the devices A and B cannot communicate because of being far. How often would this be the case?
  + A: Depends on the situation, but mayhappen with the laptop closer to the AP where as the XR device in the other part of the area and the XR may not reach the device
  + C: Need data to show how often on this
  + C: May use P2P directly and get higher throughput
  + A: The presentation does not address the case
  + C: Will there be a single QoS IE across the two links? Or will it be separate QoS IE
  + A: They are different but can be discussed on how they can be combined
  + C: The assumption you are making that the device B does not understand that the QoS requirement. How reasonable is that assumption? This assumption needs to be vetted
  + C: Is the device B needs to inform AP?
  + A: No, it is the AP that is setting up and device B does not set it up
  + C: Can a 11be capable Device B send the SCS request?
  + A: The assumption is that even if device B is 11bn capable it will not send SCS requet
  + C: Is there any sequencing in slide 5 second part of the figure
  + A: no, they can run in parallel.

The session was recessed at 10:00 AM.

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

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex and in Panama City, Panama (in-person).

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 1:30 PM. The Chair introduces himself and the Secretary.
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6. The Chair asked whether there is comment about agenda in 11-23/2174r6. The agenda was approved.

**Submissions - Power Save Part 1**

1. [23/1875](https://mentor.ieee.org/802.11/dcn/23/11-23-1875-00-00bn-power-save-proposal-for-non-ap-mobile-ap.pptx) Power save proposal for non-AP/mobile-AP Shubhodeep Adhikari (Broadcom)

Discussion:

* Does not intend to run the straw poll
* C: What is the difference between EMLMR and this proposal?
* A: Goal is to optimize for higher power saving and extend to other modes and also to mobile AP
* C: What is the granularity of the bandwidth that will be reduced to?
* A: Power consumption does not reduce linearly with bandwidth.
* A: Device can wake up at any bandwidth unlike the current state where they wake up for 320 MHz
* C: Will AP make scheduling decisions just for that TXOP
* A: Yes, The AP would make scheduling decisions only for the TXOP
* A: The power consumed even for reception varies with the MCS level

1. [23/1922](https://mentor.ieee.org/802.11/dcn/23/11-23-1922-00-00bn-multi-link-sm-power-save-mode.pptx) Multi-Link-SM-Power-Save-Mode Jason Yuchen Guo (Huawei)

Discussion:

* C: What is the behavior after receiving the ICF on one link? How does it work?
* A: ICF merely indicates for the other links to be ready for frame exchange sequence. IF ther is no frame exchange sequence, there will be a timeout
* C: How long is the timeout to be ?
* A: (missed it)
* C: Applicable for STR?
* A: Yes, for NSTR, there needs to be more
* C: what would be the effect of switch back from higher to lower?
* C: Comparing this to EMSR, the transition time is 0 and if the STA received ICS and another link is in the power save mode
* A: In EMLSR, at least two links should be available
* C: May be combined with EMLSR
* C: what is the expected behavior of the receiving STA? Would it respond only on the primary link or other links?
* A only on the primary link and others should abide by padding

1. [23/1936](https://mentor.ieee.org/802.11/dcn/23/11-23-1936-00-00bn-ap-mld-power-save-follow-up.pptx) AP MLD power save follow up Liwen Chu (NXP)

Discussion:

* C: On the Intra PPDU power save if the AP goes to microsleep and an OBSS device may find that the AP is not there
* A: The AP would manage through the Basic NAC
* C: Do you assume that the intra-PPDU how would the channel would be protected
* A: Should transmit RTS to protect the TXOP
* C: How about unassociated STA?
* Full bandwidth may be used but 20 MHz may be good enough. Otherwise there may be issues

1. [23/1965](https://mentor.ieee.org/802.11/dcn/23/11-23-1965-01-00bn-dynamic-power-save-follow-up.pptx) Dynamic power save\_follow up George Cherian (Qualcomm)

Discussion:

* Two strawpolls offered
* C: Looks like a unified framework for power save. Can you comment on Shubho’s presentation. If the other presentation achieves what we are looking for do you think you would still need framework
* A: There are multiple features that we are seeking, STA, AP Power Save and coexistence. We could have tailored solutions for each of the scenario but unifying the approaches through a framework would be better
* C: Should HT-duplicate frames need to be used for these
* A: These are all just the candidates if the receiver says that it only can use 20 MHz reception
* C: Proposal has been made from AP for a single link but should make there is no packet loss
* C: How can these work for infrastructure AP
* A: STAs expect AP to be power save. From IEEE angle, we are just providing tools
* A: there may be more alternatives need to be provided for coexistence; and having time for processing would be useful
* C; Same question as below
* A: More practical with Mobile AP
* C: Can a STA can transmit coming off listen state
* A: Yes, from transmit side anything can be done. From interop side, we are interested in the transmit side

1. [23/2003](https://mentor.ieee.org/802.11/dcn/23/11-23-2003-00-00bn-client-power-save.pptx) Client power save Laurent Cariou (Intel)

Discussion:

* + Two straw polls
  + C: Bandwidth expansion is not possible today due to padding. Seems like it will work for lowering bandwidth
  + A: If you are operating 20 MHz and receive ICF you cannot switch until you end your receive process. Configuration can be changed until FCS is processed
  + C: Slide 4. There are multiple FCS2 in the figure. How many are needed?
  + A: This all needs to be discussed. If you use the current FCS, then the 4 octets need to split further. There could be some other information added which also needs to be discussed
  + C: Would this mechanism run in a dense network?
  + A:It would be similar to the way CCA works with SIFS. It would be similar
  + C: But SIFS is much shorter, but this is longer
  + A: MU-RTS works the same way
  + C: More consideration is needed
  + FCS2 is only repeated twice
  + C: Could this proposal be used for not only bandwidth but also MCS etc
  + C: How does the STA determine the parameters for the higher performance mode? Is it prenegotiation or during ICS?
  + A: Today it is more long term. There are proposals with dynamically changed. But most interesting cases are listen mode and not the TXOP
  + C: Need for 2 FCS2 fields
  + A: Clarification again provided that it is to fit 4 octets using user Info

The session was recessed at 3:30 PM

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

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex and in Panama City, Panama (in-person).

**Introduction**

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6. The Chair asked whether there is comment about agenda in 11-23/2174r6. The agenda was approved.

**Submissions - Power Save Part 2 & SP**

1. [23/2040](https://mentor.ieee.org/802.11/dcn/23/11-23-2040-00-00bn-enabling-ap-power-save-follow-up.pptx) Enabling AP power save\_follow up George Cherian (Qualcomm)

Discussion:

* One straw poll but will not be run now
* C: How would the legacy deal with this situation
* A: This cannot be a mechanism for legacy station as it cannot understand signaling and cannot use it
* C: Scheduled PS is discussed, may be there should be unscheduled PS
* A: Yes, both otpions are presented; Dynamic AP PS is in line with unscheduled PS
* C: For the unscheduled PS, AP has to be in listen mode
* A: It has to listen and go into full state mode
* C; Has there been a qualitative analysis for each of the techniques for companies to determine?
* A: Companies can determine what techniques they want to use
* C: What if there are SCS and SPs that will get affected by AP Power save
* A: Certainly a consideration at the AP for going into power save. For an infrastructure AP, scheduling may be hard due to the variety of users; but in a mobile AP, this may be easier
* C: We need solutions that solve for legacy and also other variations
* A: Open to what is suggested
* C: Is there a negotiation process?
* A: We are open to it but it does not make sense for the clients to negotiate with AP on its power save. A better way is for the clients to negotiate the QoS parameters and the AP can consider. The plan is not to have a huge protocol

1. [23/2055](https://mentor.ieee.org/802.11/dcn/23/11-23-2055-00-00bn-icf-rcf-transmission-rules.pptx) ICF-RCF transmission rules Dmitry Akhmetov (Intel)

Discussion:

C: Slide 5: Are you saying that the STA1 should simply give up after sometime and go to the next one

A: No point in trying if it is not working, then just wait and a little

C: There may be some corner cases, especially with how NAVs are setup and may end up with more power consumption

C: Slide 4:Already there are frames that solicit short response and check the NAV and medium being idle. Should this rul be inherited for ICF

A: This is slightly different. With RTS/CTS the response is different. If it is anything else there is a specific acknowlegedment but it does not give you the NAV setting. In neither of the cases you have 100% of the nature of the medium

C: Allow ICF being sent without regard to the NAV setting at the receiver

C: You are talking about OBSS and hidden node

A: Yes, that is the typical case

C: RTS/CTS is already designed and can be used. Are you trying to define a new mechanism and may end up with issues at legacy STA. If ICF is a failure then the legacy could not understand the frame

A; Potentially that may be the case, but if the responder sends a response, it should not affect the STAs around STA1 NAV

C: Slide 6, when DTS is not supported the throughput is 22 Mbps where as the other one is sending 45 Mbps

A: But one link is taking advantage over the other, whereas it gets balanced with the DTS, but more simulations need to be done to validate these results. When it is unbalanced the blue ones will struggle and will have long contention windows

C: Where is the suffering coming? Is this coming from high packet loss on the orange side

A: These results only enable DTS. This simulation does not implement the limit number of RTS

C: Is it the case that the orange ones are hidden from STA1. Shouldn’t they have symmetric performance? Why does one has advantage over the other? Where is this hit in performance happening?

A: Need to think about it. But if you don’t limit then it would just be sending RTS after RTS.

C: In slide 4, the response frame is a new frame

A: Yes – there could be other options, but for now it is a new frame

C: What is the expected behavior for legacy STAs? You said the NAV is set to 0

A: setting the duration to 0 will do nothing

C: Comment on how this can scale

C: How does ICF affect the legacy stations? How will it affect the ongoing transmission

A: I tried to answr through the simulation with one side supporting. Just a simulation but more study is required

1. [23/1871](https://mentor.ieee.org/802.11/dcn/23/11-23-1871-01-00bn-m-ap-coordinated-transmission-framework.pptx) M-AP Coordinated Transmission framework Arik Klein (Huawei) [2SP MAP 10’]
   * SP on Slide 12 will be run.
   * Q&A starts now
   * C: Good direction. There are different schemes discussed with varying granularity including at TXOP line. Is this a guideline or instead every coordinated mechanism should start with it. Step 3 may be not necessary and may become problematic
   * A: SP2 sets Stages 1-3 to be optional or over wireless using different set of exchanges
   * A: Context of pre-TX is different from corrdinated beamforming or coordinated OFDMA
   * C: I like what you said but it is not there in the SP. A note can help
   * A: that is why we have two SPs so that people can express their opinion
   * C: To ensure that more discussion is done, can the two straw polls be combined and only have the first two stages (discovery and negotiation)
   * A: Not sure I understand but we can run 1
   * C: I can send what I propose
   * C: Likely this SP should be brought in a bit later if we know which coordination schemes we need as right now SFD is black. Let us have some coordination schemes be defined and then we can bring this SP in
   * SP is deferred
   * Q/C: Slide 9, 3rd major bullet, having pre-tex operation is required to execute in the firt TXOP. This is pretty restrictive and may affect other TXOPs that have nothing to do with this coordination. There may be TXOPs that are part of the agreement and some are not and would like to keep them separate
2. [23/1888](https://mentor.ieee.org/802.11/dcn/23/11-23-1888-01-00bn-mac-header-protection-follow-up.pptx) MAC Header Protection - follow-up Abhishek Patil (Abhishek) [1SP Sec. 7’]
   * C: Expect this feature to be mandatory or optional?
   * A: Would like to be mandatory. This SP is not going to be ask whether the feature should be mandatory or optional. What is your personal opinion?
   * C: Not sure
   * C: Too early to determine if it is mandatory or optional
   * C: Add a text of “It is TBD whether the mechanism is manatory or optional”
   * C: Concern that the group addressed frame has not been addressed
   * A: We have been looking into it, but there are additionaly complications. For now the SP is for individually addressed frames. I can add a note to say that “group addressed frames” will be handled
   * C: Do not think that they should be considered separately
   * A: Why not protect individually addressed frames now and consider group later
   * Straw Poll text:

Do you support to define a mechanism in TGbn that protects the MAC header for individually addressed Data and Management frames?- It is TBD whether the mechanism is mandatory or optional- It is TBD to protect group addressed Data and Mgmt frames.

Options are Yes, No and Abstain

Results: 87Y 31N, 44Abs, 63 No answer

1. [23/1908](https://mentor.ieee.org/802.11/dcn/23/11-23-1908-00-00bn-seamless-roaming-procedure.pptx) Seamless Roaming Procedure Yelin Yoon (LGE) [1SP Ro. 7’]
   * C: Support it
   * C: Add some text to clarify the two AP MLD belong to the same UFT MLD
   * A: Why restrict it?
   * C: Otherwise there may be issues
   * A: No need to mention two AP MLDs
   * Delayed to the next session

The session was recessed at 10:00 AM.

# January 17, 2024, AM2 (TGbn MAC ad hoc session)

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex and in Panama City, Panama (in-person).

**Introduction**

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6. The Chair asked whether there is comment about agenda in 11-23/2174r7. The agenda was approved.

**Submissions – Roaming Part 1**

1. [23/1908](https://mentor.ieee.org/802.11/dcn/23/11-23-1908-00-00bn-seamless-roaming-procedure.pptx) Seamless Roaming Procedure Yelin Yoon (LGE) [1SP Ro. 7’]
   * Continued from previous session
   * Modified Straw Poll text:

Do you support to define a mechanism in 11bn that enables a non-AP MLD to roam from one AP MLD to another AP MLD and the non-AP MLD remains in state 4 (see 11.3) during and after roaming to the other AP MLD?

Options are Yes, No and Abstain

Results: 83Y, 20N, 22Abs, 53 No answer

1. [23/1914](https://mentor.ieee.org/802.11/dcn/23/11-23-1914-01-00bn-enhanced-security-considerations-in-uhr.pptx) Enhanced Security Considerations in UHR SunHee Baek (LGE) [2 SP Ro. 7’]
   * SP deferred
2. [23/1884r2](https://mentor.ieee.org/802.11/dcn/23/11-23-1884-02-00bn-seamless-roaming.pptx) Seamless Roaming Duncan Ho (Qualcomm)
   * 5 SPs, but one is same as with the SP run on 23/1908, so 4 SPs to be run
   * C: SP2: Why limit the exchange to only one AP MLD
   * A: Just proposing this due to the complexity involved but will discuss offline
   * C: If non-AP MLD is not in process of roaming, so what is the intention?
   * A: The intention is to talk about not in the process of roaming and be status quo
   * C: Can talk offline
   * C: Need more discussion on architecture as some do not require this MAC changes and defer the SP3
   * C: SP2. Why limit to only one AP MLD. Same comment as before
   * C: SP3 based on the experience that he has, he thinks this may not be needed if the network is engineered correctly and would not like to handle buffered DL data frames. Based on FT experience, he thinks that it is overly complex?
   * C: SP4, transfer of context over backhaul; what does it mean?
   * A: Any AP connectivity
   * A: backhaul could be wired or wireless but this is over the air
   * C: SP3, it is too detailed for this point of time
   * C: SP5, Do you intend to define new request and response frame?
   * A: Not going into details, but we need two messages. Could be a new frame or an existing frame
   * C; There are multiple presentations and all of them are in support of this item. Other presentations will clarify it.
   * C: On buffered data, concern with many stations and may seem impractical. But the following presentations will support the need and proposes to have joint proposal
   * A: Straw polls will be deferred and get more comments
   * C: The use of the term MLD everywhere, will there be restrictions?
   * A: Everything after .11be is an MLD and the reason for the usage of the term
   * C: It seems quite restrictive now onto handle buffered traffic. There may be situations where the client may not want to have to handle old traffic
   * C: SP4 does not include the data. Can you clarify?
   * A: Yes
   * C: SP5 defines a frame exchange sequence and discuss in the future
   * A: SP5 is not trying to create the sequence
3. [23/1897](https://mentor.ieee.org/802.11/dcn/23/11-23-1897-00-00bn-thoughts-on-improving-roaming-under-existing-architecture.pptx) Thoughts-on-improving-roaming-under-existing-architecture Guogang Huang (Huawei)

* C: is it in your case, there is no roaming at all and as the client moves and keeps adding and removing links?
* A: Yes
* C: In this architecture a client can be serviced by multiple APs
* A: Yes
* C: How does the AID gets assigned?
* A: (missed it)
* C: The general direction appears to enable context switch between MLDs. The context transfer is TBD and the general direction appears to be in line with other presentations. Talk more offline
* C: slide 9. Not requesting new IP address. What is the intention?
* A: Trying to keep the same address. But usually specific frames need to be used. Let us take it offline
* C:You assume that hot-stand by, association is required with each MLDs. But there are other ways to get hot-stand by. And if goes that route, we can unify the approaches while keeping the context
* A: Main difference is that if the non-AP MLD has to generate a PTK.

1. [23/1907](https://mentor.ieee.org/802.11/dcn/23/11-23-1908-01-00bn-seamless-roaming-procedure.pptx) Seamless Roaming for 11bn Yelin Yoon (LGE)
   * C: Slide 5, Upper MAC and lower MAC on the same entity has issues. The UFT controller itself will be hard to manage. There could be scalability issues> Need offline discussion
   * A: Agree with having offline discussion
2. [23/1937](https://mentor.ieee.org/802.11/dcn/23/11-23-1937-00-00bn-smooth-roaming-follow-up-1.pptx) Smooth roaming follow up 1 Liwen Chu (NXP)
   * C: Slide 5 – you have two options for basic ML element but use only for roaming. Why the inconsistency?
   * C: consensus here is that we have context roaming. Would support it
   * C: Slide 5 – you talk about AP MLD MAC address and the roaming ID. Why do you need both?
   * A: Debatable that the ID is required
   * C: Slide 8: Why do we need new-defined TBTT information?
   * A: The AP MLD has to carry the TBTT information because there are two AP MLDs

The session was recessed at 12:30 AM.

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

Chair: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex and in Panama City, Panama (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](mailto:Xiaofei.Wang@InterDigital.com)), Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com)) and Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com))
6. The Chair asked whether there is comment about agenda in 11-23/2174r9. The agenda was approved.

**Submissions – Roaming Part 2**

1. [23/1971](https://mentor.ieee.org/802.11/dcn/23/11-23-1971-00-00bn-further-thoughts-on-seamless-roaming.pptx) Further thoughts on seamless roaming Ryuichi Hirata (Sony)

Discussion:

* C: There are many proposals on roaming but I think the trick is to transfer the context and likely the simplest way
* C: You move all the things there; so we will not need to move one link at a time
* A: (couldn’t answer)
* C: emphasize the previous comment. Moving all items is the most natural protocol

1. [23/1976](https://mentor.ieee.org/802.11/dcn/23/11-23-1976-00-00bn-uhr-seamless-roaming-for-multi-link-device.pptx) UHR-Seamless-Roaming-for-Multi-link-Device Hui Che (Ruijie Networks Co., Ltd.)

Discussion

* + C: Slide 8, in stepps 5 and 6 old links appeared to be deleted before the new link
  + A: No, new link is established and the n the old links are deleted
  + C: In step 8, that allows the AP to delete the links. The blue arrow that is indicating appears to be coming at any moment. Can you clarify?
  + A: yes
  + C: I disagree with it as it will lead to bad behavior
  + C: Slide 13, second bullet; not clear why this is better? There needs to a switch back and forth and I can not do this seamlessly. Why do you think this is always better
  + C: Radio capabilities need to be considered and once you do all this, I do not think this would be helpful
  + C: consider and study more
  + C: Slide 6, it appears there is no additional handshaking so why is the information being shared
  + Chair: Please take it on the reflector as it appears it is hard to hear

1. [23/1996](https://mentor.ieee.org/802.11/dcn/23/11-23-1996-00-00bn-improve-roaming-between-mlds.pptx) Improve roaming between MLDs Po-Kai Huang (Intel)
   * Several SP but not planned to run at this time
   * C: Slide 8, concern is that how device can remain in state 4. It means that the AP MLDs are associated with each other
   * A: The intent is to be in state 4 with the first MLD and then to the next MLD. Language can be fixed. Take it offline
   * C: Slide 4 on parameter synch. Agree that we cannot split the data path and will only cause further delay. Essentially agree with the presentation.
   * C: There will not be a need to do parameter synch if the MAC functions are split. Do not understand why there will be performance issues
   * A: I don’t think it can be enforced and need to study the commenter’s presentation and understand how the issue can be avoided
   * C: Which parameters need to be shared
   * A: If a center location is assigning the SN, we need to go to this entity, lock it, get the next SN and then unlock it
   * A: we need to design realistic stuff and imagine the implementers will somehow to solve it. Talk more offline
   * C: How are you going to deal with some of the functions that need to be shared? How wil you handle with context transfer
   * A: Can you elaborate on the functions? If it is just one after another then you will need to go and get the context. Will synch offline to understand the question better
   * C: Depending on the market requirements, perhaps it makes sense to multiple frameworks; for example in a home there may be only two or three APs and can be connected
   * A: Having connected to both is an ideal situation, but not realistic and we should not impose this architecture
   * C: Which parameter should be shared? Etc
   * A: We can discuss and come up with numbers
   * C: SP #2; is it really needed? A non-AP MLD is only associated with one AP MLD
   * A: agree but there were other proposals which said something different. I would like what is in SP#2 is the default
2. [23/2157](https://mentor.ieee.org/802.11/dcn/23/11-23-2157-00-00bn-seamless-roaming-within-a-mobility-domain.pptx) Seamless roaming within a mobility domain Binita Gupta (Cisco)
   * Several SP but not planned to run at this time
   * C: Slide 4, different roaming options option B and C, prefers names in parenthesis. Option B and C are very similar with Option C is addingadditional capability
   * C: Slide 10, when initiated by STA, there are STA parameters, but when initiated by AP, there are no STA parameters and is unclear on how it works
   * A: Yes, there may be another step that is needed
   * C: In the new setup you are proposing, have you assessed the changes needed on the STA side in architecture and behavior
   * A: Data path handling is same as in 11be, a similar kind of SMD/logical entity would still be there. It maintains a single association and will not do reassociation but moves across the SMD
   * C: slides 10 and 11, the roaming notification is used both; or is the step 0 in slide 11 is needed
   * A: Step 0 in Slide 11 for AP initiated case
   * C: Please indicate that it is AP initiated case
   * C: What is the selective data transfer? How is the selective data transferred determined?
   * A: the point is that forwarding all data may not be possible, but perhaps for selected SCS data to get some data through
   * C: slide 23. Why do you want to mandate support for 11r/FT for all devices?
   * A: You mean for UHR, it does not need to be mandated for all devices, because some IOT devices are not moving?
   * C: Yes
   * C: For some applications such as container ships, the IOT devices may still move and best to have a single mandatory mechanism to other devices
   * A: disuss more offline
   * C: Slides 4 and 5: Understand you have enterprise in mind where you may have hundreds of AP. For some other distribution such as an AP, there are only small number of APs and distributed MLO may work. Do you agree that we will have a different architecture based on the size of the network
   * A: We should pick an architecture that can be made to work in all scenarios and address for any specific markets
   * C: Slide 8 the client performances and associated with an SMD. Can a client not be related to SMD and how/when the client associates with MLD AP and how does it works
   * A: SMD helps in association across multiple AP MLDs
   * C: The relationship is not clear
   * A: SMD is control plane entity and is not maintaining path, when the new AP MLD, then context switches – ran out of time

The session was adjourned at 10:00 AM.