IEEE P802.11  
Wireless LANs

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| TGbn September October 2024 Teleconferences Minutes | | | | |
| Date: 2024-11-12 | | | | |
| Author(s): | | | | |
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|  |  |  |  |  |

Abstract

This document contains the minutes for TGbn September and October 2024 teleconferences.

Revision history:

* Rev0: First version of the document.

Abbreviations:

* C: Comment.
* A: Answer.

# 1st Conf. Call: September 23rd, Monday (19:00-21:00 ET) – MAC/PHY

* MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-00-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1656-00-00bn-minutes-for-tgbn-phy-ad-hoc-teleconference-in-september-to-october-2024.docx>

# 2nd Conf. Call: September 26th, Thursday (10:00-12:00 ET) – MAC

* <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-01-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>

# 3rd Conf. Call: October 7th, Tuesday (19:00-21:00 ET) – MAC

* <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-02-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>

# 4th Conf. Call: October 10th, , Thursday (10:00-12:00 ET) - Joint

* Call the meeting to order
* IEEE 802 and 802.11 IPR policy and procedure
  + Patent Policy: Ways to inform IEEE:
  + Cause an LOA to be submitted to the IEEE-SA ([patcom@ieee.org](mailto:patcom@ieee.org)); or
  + Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or
  + Speak up now and respond to this Call for Potentially Essential Patents

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the WG Chair.

**Nobody spoke/wrote up.**

* + Copyright Policy: Participants are advised that
  + IEEE SA’s copyright policy is described in [Clause 7](https://standards.ieee.org/about/policies/bylaws/sect6-7.html#7) of the IEEE SA Standards Board Bylaws and [Clause 6.1](https://standards.ieee.org/about/policies/opman/sect6.html) of the IEEE SA Standards Board Operations Manual;
  + Any material submitted during standards development, whether verbal, recorded, or in written form, is a Contribution and shall comply with the IEEE SA Copyright Policy.
  + **Patent, Participation, Copyright and policy related subclause:** Please refer to the agenda document([11-24/1643r](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-07-00bn-sept-nov-tgbn-teleconference-agenda.docx)7).

Copyright Policy was presented.

* Attendance reminder.
  + Participation slide: <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180-05-00EC-ieee-802-participation-slide.pptx>
  + 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 Wireless Interim/Plenary Session” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “TGbn 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:  
      Yusuke Asai ([yusuke.asai@ntt.com](mailto:yusuke.asai@ntt.com)) & Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
  + Please ensure that the following information is listed correctly when joining the call:
  + "[voter status] First Name Last Name (Affiliation)"
* Agenda
  + Chair reviews proposed agenda found in [11-24/1643r](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-07-00bn-sept-nov-tgbn-teleconference-agenda.docx)7.
  + Discussion:
    - The request to remove the submission [11-24/1389r0](https://mentor.ieee.org/802.11/dcn/24/11-24-1389-00-00bn-coordinated-spatial-reuse-design-details.pptx) from the presentation list was raised by the author. Because the content of the submission was already presented in the other submissions.
  + The modified agenda approved with unanimous consent.
* Announcements
  + Slido did not save voting data for Motion 35 (which had a request for recorded vote) and Motion 39 which did not have a request for recorded vote. Now for:
  + Motion 39: The preliminary result will be the final result, i.e., 175Y, 8N, 69A (passes), since we don’t have the data for validation.
  + Motion 35: Need to ask member that requested recorded vote (Shimi Shilo) if the request for recorded vote still stands
  + If the request for recorded vote still stands then Motion 35 needs to be re-run so that we can obtain such data.
  + If the request for recorded vote is relinquished then for this motion the preliminary result will be the final result, i.e., 148Y, 39N, 81A (passes), since we don’t have the data for validation.
  + Slido saved voting data for Motions 40 and 41 and have been used for vote validation. Validation shows that some members with no voting rights are actually voting and also some inconsistency in using the First Name, Last Name, Affiliation format. In order to ensure that this does not happen:
  + Please ensure that the following information is listed correctly when joining the call: "[voter status] First Name Last Name (Affiliation)"
  + Chair may ask one of the Vice Chairs to monitor the participants list during the Joint call during which motions are scheduled. Vice Chairs may request members to comply with above criteria. Votes from members that do not satisfy the above criteria will not be counted during voting validation.
  + Please check that you have voting rights here:

<https://www.ieee802.org/11/members.html>.

Please don’t vote on Motions if you don’t have voting rights.

C: (from Shimi Shilo, who requested the recording vote for the Motion 35 on the last September meeting) I am OK with relinquishing the request.

🡪The preliminary result for the motion 35 became the final result. (148Y, 39N, 81A (passes), as recorded in [11-24/0171r16](https://mentor.ieee.org/802.11/dcn/24/11-24-0171-16-00bn-tgbn-motions-list-part-1.pptx))

C: In some situations, the family name goes first and capitalized. We should allow such kind of flexibility.

A: I just suggest to follow this form. It also simplifies our script for validation check. We don’t mind the order of the first and the second names. If you choose to have, for example, “voter status, last name, first name, comma, affiliation,” that is still perfectly fine.

A: Chair is thinking that one of the Vice Chairs monitors the participants list in the sessions when we run motions. If we see the members that do not follow the formula, then we can ask the members via the chat to update their entry.

C: We need to always validate. I don’t know whether it will be super important for when there is small volumes case or the result is not changing much.

A: We do validate all the motions that we have the date independently as to whether they are small difference or not. And, technically, it makes sense because it is an official record of the motion.

C: Can we have some updates of the voting result after the validation in the meeting minutes?

A: We already do that always. So, we report preliminary results during the motion when it is run. And then, we work on the validation. The update results are recorded on the minutes and the motion lists.

----- (Comments on the chat window) ---

C: All motions are validated in order to be recorded in the minutes.

C: The chair and the secretary double-check the voting results.

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* Initial TGbn guidelines (includes spec text drafting for TGbn D0.1): [11-24/1682r0](https://mentor.ieee.org/802.11/dcn/24/11-24-1682-00-00bn-tgbn-guidelines.docx)
  + “1. TGbn uses WebEx for joining online”
  + “2. Guideline-Running Straw Polls/Motions via Online Tools (Slido)”

C: Is the rule for a straw poll or a motion?

A: A straw poll is recorded. But no validation is checked for a SP.

C: Can we allow to vote from the chat window for a motion?

A: I had to checked also with the task group leadership as well. The issue with allowing the chat is to create a lot of burden in terms of process.

C: The Slido works quite slowly in some conditions. Because a motion is quite important, my opinion is to allow the vote via chat window.

A: I will check one more time with the working group officer. If there is a specific case where you cannot vote at all, it will be checked. There was the guidance that Slido is the official tool for voting. So, we have to rely on that, but I will echo this information.

C: Previously, we could not request for recorded vote for a straw poll. Only we could do it for a motion. Now, can we request a recorded vote both for a SP and a motion?

A: We had allowed the trouble results to be recorded as well and obtained upon request in post pandemic. Now the Slide has that functionality back then. Instead of allowing all members or any members to obtain the data, it is essentially limited only to the member that is running the straw poll. There are several instances at least I received complaints that a member runs a straw poll and he says that nobody comments anything.

C: Do we have to request it at the beginning or even in the middle of the session?

A: I need to know in advance when recorded votes are needed so that we ensure that there is no conflict.

C: I saw that we were only going to use the Slide for working group motions. Has something changed since September meeting?

A: I did discuss it with the working Group chair as well to confirm yesterday.

C: If you cannot expect people to tell you in advance that they want to vote to be recorded for thing that are not only that are not also announced in advance. If someone asks for a motion, unexpected motion, then of course you cannot say in advance. I need to record it both, please.

A: Today, I allocate 30 to 45 minutes in MAC/PHY ad-hoc for straw polls. So, they are well known in advance.

If we have this information 24 hours in advance, members will know 24 hours in advance that there will be straw poll. In terms of motions, we have pre-established sections for motions on the Thursday PM1. In the joint teleconferences, those are going to be announced at least 10 days in advance, and the motion content is going to be available for members to review for at least 10 days as well.

C: For my clarification, if anybody brings a motion or a straw poll during the session which has not been pre-announced, and anybody wants it to be recorded, then the chair will not run this motion or straw poll at that session and it will be run another time when the Slide can be set up, is that correct?

A: Yes.

* + “3. Guideline-Increasing MAC queue processing speed” and   
    “4. Guideline-spec text drafting for TGbn D0.1”

C: What do we call it consensus, the majority of 50% or 75%?

A: 75%.

C: I don’t think you can say 75% consensus for a straw poll. If you want to do that, we need to discuss that with the other parts of the leadership.

A: I will put it this way. We can have some more discussion with the task group leadership as well.

C: There is no problem with running a straw poll establishing consensus, and then basically proceeding with a motion.

A: I mean to clarify to the members because it is something that we have been doing quite consistently but so there is an importance in the words that we write as well so when we run a straw poll, it is for information gathering. We do have it as a mechanism to get a sense of where the group stands if that were to be run in a motion. Hence, we use the 75% of criteria. But we cannot say that a straw poll with 75% or more yes is an official consensus or

C: Is the condition “TGbn editor will include the spec text to the draft”, only applied when motion passed?

A: Yes.

C: Usually, the motion text is similar to the corresponding straw poll. Do you want to have another procedure? What is your motivation?

A: This is the same thing that we do today. You can make a presentation and run a straw poll on any of the calls. The only recommendation compared with what we do with technical submissions is that this document contains the SFD should be posted to the server for it is seven days prior to running the straw poll, so that members have sufficient review time. Once you have presented and if there is a consensus of the straw poll, you can send a request of the motion for the particular draft text to the chair. The motion is queued in the joint sessions.

C: Does that mean that motion will go to the draft?

A: In the SFD, we are still going to approve motions with technical content to the SFD. If you have a general concept under your technical submissions, those motions are going to be added to the SFD. This is for proposed draft text.

C: Is the draft text is based on the motion in the SFD, right?

A: Yes. That is the intent. So, the only thing is that these motions are not going to say move to add the SFD. Because this is spec text, so thing is just to move to add to D0.1 of the 11bn.

C: I know the schedule calls for D0.1 in January. Is there any expectation about the completeness of this document?

A: I don’t expect it to be complete. I expect it to contain all the PDTs that have been approved by then. We cannot even predict whether it’s going to be complete or not. We can only work towards having the draft into the D0.1.

C: Will the D0.1 include all the draft until January? Would the SFD continue to be developed for other concepts in parallel to draft?

A: D0.1 and the SFD are going to work in parallel until the group decide not to populate the DFS any more. We are going to work on the spec text. My guess is going to be between D0.1 and D1.0. But of course, even after D1.0, it doesn’t mean that we are going to not discuss any more new features. At some point, we are going to stop populating the SFD, but what that point is too soon to say.

(Chair will post the revised version of the TGbn guidelines after the teleconference.)

* Technical Submissions – -Channel Access + Low Latency + SR:
  + [11-24/1481r0](https://mentor.ieee.org/802.11/dcn/24/11-24-1481-00-00bn-csma-with-enhanced-collision-avoidance-follow-up.pptx): CSMA with enhanced Collision Avoidance-follow-up

Sigurd Schelstraete (MaxLinear)

C: In the slide 3, how does the STA3 know that it is a survival station?

A: If there were multiple STAs and they both had their short packet here, so it is just that statistically, it is more likely that the STA4 and the STA5 are eliminated at some point. But it is essentially possible, but much less likely than with the traditional CSMA. There are still multiple survivors.

C: If the STA1 does not know it is a survival station, can it transmit the data after that?

A: It is not that it keeps going until it says, I’m the only one, or it’s a fixed number of rounds, and then it transmits knowing whether there is anyone else left or not.

C: In the slide 3, it seems like the clients will grab the medium more often in the end. So, it seems that one station behaves more aggressively grab these stations.

A: All these stations behave in exactly the same way. It is similar to CSMA. So, random numbers in STAs are going to determine whether they survive or not.

C: How do the stations determine that the collision occurred?

A: They listen like the STA2 and the STA3. They don’t determine there is a collision. They determine that the medium is busy and someone else has got the medium now. So, they should wait.

C: The STA1, 4 and 5, they all transmit in that in the equal time, and then somehow know that they continue and the third one detects the collision What’s different in the STA?

A: The STA5 detects a collision on the second round. All the stations will go through three rounds. It’s not that they need to detect a certain condition for them to start transmitting these signals. There's no expectation of detecting collisions.

C: This proposal is aligned with general direction in the previous presentation on enhancing EDCA.

A: I agree with that it is one of the things that have been discussed so it is definitely fits the problem statement there is.

* + [11-24/1482r0](https://mentor.ieee.org/802.11/dcn/24/11-24-1482-00-00bn-csma-with-enhanced-collision-avoidance-for-low-latency-traffic.pptx): CSMA with enhanced Collision Avoidance for Low-Latency traffic

Sigurd Schelstraete (MaxLinear)

C: In the slide 17, why the 95 percentiles performance is better if you have 10 streams than if you have 5 streams?

A: In these cases, the low latency traffic streams really take up a small portion of the overall network throughput. It is dominated by the best effort traffic.

C: When CWmin is equal to zero, what is happening? How do you handle the Tx to Rx switching?

A: There is still the AIFS. Zero would mean they have to do the fixed backoff. All of them will transmit here. They don't know that there's a collision. Basically, the first round is like wasted because all of them transmit. Then the second and third round have to pick it up. So, the effect will be in the second and third round through the picking of random numbers.

C: In the current way designed with CWmin of zero, there is no way for legacy devices to compete. Do you have result if we make CWmin is equal to three?

A: The reason of the shape of this curve, some of it is due to collisions or contention with the best efforts. In this presentation, only the low latency traffic has to implement this.

C: I just want to make sure that we know that legacy devices have low latency traffic and it is good to not bring them out of the game completely, because it might be good as well to have some legacy devices on your simulation and show how much we affect legacy devices.

A: Are you looking for the effect on legacy devices?

C: Correct. Because the straw poll we wanted to run was saying that the effect should be balanced. What is this effect going to look like?

A: Is it the legacy device with low latency?

C: Yes.

A: The legacy devices would obviously have lower access priority than this new service, but it would still be better than best efforts.

C: Do you use RTS/CTS for this scheme?

A: No. This is without RTS/CTS.

C: I think we should use RTS/CTS. Because now the baseline results is a little bit inflated. Because every time you transmit a packet, the latency becomes really high because of long packet.

A: I think RTS/CTS is mostly dealt with from an AP to a STA. It might help a little bit, because it’s shorter the opposite and full packets.

C: You are making the collisions very small in this scheme, and you recover quickly. So, it makes sense to use the RTS.

A: Maybe this comment maybe applies more to the previous simulations I presented, which were in terms of network throughput. In this case, I’m creating this special access category. I don’t think RTS/CTS is needed.

C: I think the eight milliseconds in the table is dropped if we use RTS.

C: I support your work improving the latency. Thank you for referencing our straw poll. We will try to run it again. I understand one of your ideas is to introduce an extra, additional, new category. Is it correct?

A: Yes. That is a part of this proposal.

C: How would you classify the low latency traffic? In the standard spec, we don’t have definition of that. We have to translate it to AC, and after that, you have this differentiated access to the medium. With this new AC, how would you place the traffic into that AC?

A: I have not gone to that level. I am just creating a vehicle for this super low latency traffic and show how it could be done and provisioned at the higher layer. Honestly, I don’t have an answer for that. I am just knowing that at the PHY or MAC layer, it’s something that could be implemented or could be achieved.

C: This new AC, or new approach, it's a very aggressive access parameter, the CW equal to zero or maybe even equal to one. This may cut off all the other traffic from the content.

A: But my assumption was that this is not high-capacity traffic. And in terms of throughput, it doesn’t require a lot, but it’s mostly important in terms of latency. To assign this access category to a high throughput traffic needs to be avoided obviously.

C: We need seriously to think how to classify the whole legacy traffic, because the use case is going to impact the performance of any feature we developed.

A: I agree with that point.

* + [[11-24/1494r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1494-01-00bn-a-transmission-scheme-for-uhr.pptx)](https://mentor.ieee.org/802.11/dcn/24/11-24-0375-00-00bn-nav-protection-for-c-tdma.pptx): A transmission scheme for UHR Xiangxin Gu (Spreadrum)

(No Q+A)

* + [[11-24/1499r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1499-01-00bn-low-latency-bss-indication.pptx)](https://mentor.ieee.org/802.11/dcn/24/11-24-0375-00-00bn-nav-protection-for-c-tdma.pptx): Low Latency BSS Indication Akira Kishida (NTT)

(Q+A session was resumed to the joint conference call on the 31st, October.)

* Any other business: None.
* Adjourned at 12:00.

# 5th Conf. Call: October 14th, Monday (19:00-21:00 ET) – MAC

* <https://mentor.ieee.org/802.11/dcn/24/11-24-1656-02-00bn-minutes-for-tgbn-phy-ad-hoc-teleconference-in-september-to-october-2024.docx>

# 6th Conf. Call: October 17th, Thursday (10:00-12:00 ET) – MAC/PHY

* MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-03-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1656-01-00bn-minutes-for-tgbn-phy-ad-hoc-teleconference-in-september-to-october-2024.docx>

# 7th Conf. Call: October 21st, Monday (19:00-21:00 ET) – MAC

* <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-03-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>

# 8th Conf. Call: October 24th, Thursday (10:00-12:00 ET) – MAC

* <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-03-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>

# 9th Conf. Call: October 28th, Monday (19:00-21:00 ET) – MAC/PHY

* MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1652-03-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-from-september-to-november-2024.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1656-02-00bn-minutes-for-tgbn-phy-ad-hoc-teleconference-in-september-to-october-2024.docx>

# 10th Conf. Call: October 31st, Thursday (10:00-12:00 ET) - Joint

* Call the meeting to order
* IEEE 802 and 802.11 IPR policy and procedure
  + Patent Policy: Ways to inform IEEE:
  + Cause an LOA to be submitted to the IEEE-SA ([patcom@ieee.org](mailto:patcom@ieee.org)); or
  + Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or
  + Speak up now and respond to this Call for Potentially Essential Patents

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the WG Chair.

**Nobody spoke/wrote up.**

* + Copyright Policy: Participants are advised that
  + IEEE SA’s copyright policy is described in [Clause 7](https://standards.ieee.org/about/policies/bylaws/sect6-7.html#7) of the IEEE SA Standards Board Bylaws and [Clause 6.1](https://standards.ieee.org/about/policies/opman/sect6.html) of the IEEE SA Standards Board Operations Manual;
  + Any material submitted during standards development, whether verbal, recorded, or in written form, is a Contribution and shall comply with the IEEE SA Copyright Policy.
  + **Patent, Participation, Copyright and policy related subclause:** Please refer to the agenda document([11-24/1643r](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-19-00bn-sept-nov-tgbn-teleconference-agenda.docx)19).

Copyright Policy was presented.

* Attendance reminder.
  + Participation slide: <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180-05-00EC-ieee-802-participation-slide.pptx>
  + 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 Wireless Interim/Plenary Session” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “TGbn 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:  
      Yusuke Asai ([yusuke.asai@ntt.com](mailto:yusuke.asai@ntt.com)) & Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
  + Please ensure that the following information is listed correctly when joining the call:
  + "[voter status] First Name Last Name (Affiliation)"
* Agenda
  + Chair reviews proposed agenda found in [11-24/1643r](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-19-00bn-sept-nov-tgbn-teleconference-agenda.docx)19.
  + Discussion: No.
  + The modified agenda approved with unanimous consent.
* POC Assignment Status/Conclusion (1hr):   
  [11-24/1698r8](https://mentor.ieee.org/802.11/dcn/24/11-24-1698-08-00bn-tgbn-d0-1-spec-text-volunteers-and-status.docx): TGbn D0.1 Spec Text Volunteers and Status Ross Jian Yu (Huawei Technologies)
  + For topics with no convergence in a single POC, the chair will ask the member(s), who requested the motion(s) that are approved on that topic, whether they would like to be POC or whether they would like to refer someone to be the POC.
  + Discussion on POC assignment for each SFD topic:

<PHY Topics>

* + - Mathematical Description

(POC: Edward Au)

<MAC Topics>

* + - Coordinated Beamforming

C: I support Ron as the POC because he did a lot of work and contribution on this topic.

C: If we follow the guideline, people bring the motion can just take the POC. I think Ron should be the POC on PHY areas.

C: I think this is a very heavy feature of PHY and initiated by the Sameer and Ron. I support either of them as the POC. They have more experience and know what overall directory should be on these features.

C: I would also like to support Ron because he pioneered all the contributions regarding this topic in 11bn. He can work closely with others.

C: We should be care about the guideline.

A: I am going to follow the guidelines. What I am going to do that if there is a still discussion about the POC, I will go and ask the member that runs the motion. In this particular case, we should avoid having a discussion about getting into PHY and MAC and move on. Because today we have to conclude on this part. In this case, I would say it’s Jason at the POC, and then have a note here that Jason will follow up with Ron.

C: For this topic, Jason did request the motion but I don’t see any supporting material from him. So, I am not sure there will be enough technical background for it.

C: I overall support this methodology. I think originally coordinated beamforming and coordinated spatial reuse are supposed to be two separate motions. But some people wanted to motion them together. So, I think we gracefully allow CBF to be motioned together with coordinated spatial reuse. In this case, whoever proposed the motion don’t really have direct contribution on this one. I really want the member to be familiar with the topic. At least the basic concept of this, the POC needs to know every detail about this topic. From this point of view, I think either Ron or Sameer probably more qualified because they have been driving this topic from very beginning.

C: I think coordinated beamforming is very PHY concentrated such as frequency offset, synchronization, or compressed feedback. We could put Ron or Sameer on the PHY part and Jason could be responsible for the MAC part.

C: Ron is not present in the meeting. I am speaking on his behalf that he is very much interested in this POC.

C: If the new guideline is whoever runs the motion is the POC, then I am afraid this may have set up a very long precedence. If someone might be working on a topic and leading and getting consensus in the overall community for a long. If the person who is actually putting the motion in the table, that is the POC, then it would have a very hard time in coming to consensus. Because no one would be willing to work with the new person.

A: My first preference is for members to reach consensus on who will be POC by themselves. This clearly didn’t happen even though we had multiple opportunities to do so. So, we are making the selection based on the above metric. Once we conclude the assignment for these topics today, then subsequent POC assignments will go again in the mode where we ask the members to converge on their own in selecting a POC. If that doesn’t happen again, then we will decide on going back to selecting based on a metric, and possibly that metric can be something other than the metric we are using today. The metric we are using today was decided essentially to be aligned with the way that we have been doing things so far, the member that has run the straw poll and that has requested motion and so on. As you mentioned, this would be the member that has been working with multiple other members to essentially coordinate and ensure that the content of the motion is agreeable by all the members. So, that would be the fairest metric for this particular purpose. But going back to the assignment for this topic, Jason would you like to split the topic into MAC and PHY and have you as POC for MAC and Ron as POC for PHY?

A: Yes, that is fine.

Chair: Any objection to have Jason as POC for MAC and Ron as POC for PHY?

No objection was heard.

(POCs: Jason Yuchen Guo (MAC), Ron Porat (PHY))

* + - Roaming

C: I believe this topic is fairly controversial. I am uniquely positioned to address those sorts of issues. I will just work with Duncan.

C: There was one e-mail sent by Mike Montemurro on the reflector. I guess would be pretty similar what the subtopics to split we discussed before. But there is no conclusion. I would follow the discussion from before maybe to try to subdivide the topics like depending on people’s preference.

C: This topic is really tough. I recommend Mike Montemurro as the POC. Because the has lots of experience on the security.

C: This topic is indeed tough and we have tried subdivision but have failed. We need a facilitator to coordinate this topic. I am OK with Duncan to be the POC.

C: Duncan will make a very good job and he will work closely with all the TTT members, Mike and all the other roaming members.

C: Based on the guideline, I support Duncan as the POC.

A: Let’s have Duncan as the POC. If you have any other opinion, please add.

C: I oppose to this POC assignment because we have a fundamental divergence and other framework and the security.

A: Thank you. The attempt to reach convergence between members fail. The only way that we can do is by using the metric.

C: I first raised the topic in the study group and work pretty diligently to get this topic on the PAR. I think it’s an important topic. And, I think Duncan brings a lot of strengths to work that. I’m sure we are going to work very diligently with the whole membership to make sure everyone’s architecture is considered and supported. I think that is a perfectly valid choice.

A: Please remember that the POC is not going to have any special powers or anything like that.

C: I’m with a bit concerned about this procedure. I’m not sure Duncan from Qualcomm, and other guys had some offline discussion. Why is only Duncan qualified for the POC? Since there is divergence there is concern about deciding a POC just based on a few comments.

A: We have let members discuss this for almost three weeks now. And there has been no convergence. We have to move on.

C: But due to the same affiliation, I question this kind of procedure.

A: Noted. You can question and if you would like to have a discussion, we can have it. There is no decision being made here by affiliations. These decisions are being made by the members that requested the straw polls and the motions that have passed on the specific topic. And this metric is something that reflects who has been working on reaching convergence and consensus on the topic. And we have to make progress on this item. If we have to keep discussing on everything, then we’re never going to be making progress.

Chair: Duncan, would you like to be the POC or have somebody else be the POC?

A: I would like to be the POC.

(POC: Duncan Ho)

* + - Power Save

C: I would give the POC to Liwen since he would do a good job doing that.

C: I’m a second to this opinion. I think Liwen is very well qualified, and he can lead the POC work for this topic.

C: Thank you for your support. I made a presentation for AP power save and also contributed to STA power save with several contributions. I will work closely with TTT members to coordinate for this feature.

C: I’m seeing some people get angry via chat window. Some people from the same group and they just support each other. To make it fair, let everybody participate this kind of job and not exclude the people from outside their group.

C: I also did a compliant about this procedure. Because I have expanded that for the roaming topic, there are fundamental divergence on the framework and security. It’s clear that Mike has lots of experience on the security. I don’t know why Duncan as the POC and most of supportive commenters from the same group. It’s not fair.

A: OK. Noted. Next question from the chat is, can we split it? I believe separating it was tried during the MAC ad-hoc meetings and it did not work. My expectation is the same as I have mentioned before. So, all the TTTs and the POCs here are going to work with each other, separation into subtopics and assignments of the work on the TTT is going to be perfectly fine. We need a POC so that the work is coordinated and the timelines are maintained so that by the next January 2025 we have D0.1 delivered. So, please follow with Liwen to assign and subdivide the work with each other. My preference of dividing into subtopics is to have just the POC here for our procedural aspects and everything else since separating into subtopics during this POC assignment did not help. Please follow up with the members and subdivide into subtopics if needed and work with each other.

C: If we have subtopics, we would have multiple POCs here. But you said we just have the single POC for power save. Does that contradict?

A: As I said, I would avoid having multiple POCs, because the moment that members start discussing on separating into multiple subtopics, everything got more complicated due to mixing technical discussions with POC assignment. To avoid that, we just need a POC for this particular topic. And TTTs can work with a POC, and they can still subdivide in topics and so on among themselves, but not here. When members were discussing in subdividing into subtopics during the MAC ad-hoc calls, we didn't reach convergence on any POC. We had two opportunities on that (two ad-hoc calls) and multiple opportunities via e-mail exchanges, and that convergence didn't happen. We have to make progress, and we cannot stay here and hope for the best. We have to make executive decisions to move forward.

C: If we have multiple POCs later who has the right to decide who can be the POC of a subtopic. Is it the POC of the power save?

A: We will have one POC. Then the POC can set the topics among TTTs to ask for feedback, for draft text writing and everything. So, the POC is nothing that is going to generate technical content that are not a selective of research team. This is the same procedure in 11be as well.

C: There are three motions for this topic. It is easy to identify the subtopic.

A: We did it the two MAC ad-hoc calls and it didn’t help. I’m not going to go over that again. Please check with Liwen and work together as a TTT member. Please again, we have to move on.

(POC: Liwen Chu)

* + - NPCA

C: I propose Matt Fischer as the POC.

C: If it is possible, I am glad to coordinate this topic.

A: I ask the editor to move POC volunteers to TTTs. I’m not sure if every member that has requested to be a POC is also in the TTT list so that all the other members will work alongside with the POC for expected selection.

C: There are some people that support Yumbo as the POC.

A: Again, we have discussed this over two MAC ad-hoc teleconferences and for almost three weeks. So, this didn’t clearly work out. I only care from a task group leadership perspective to have a POC for this topic.

C: Please appoint the POC of each topic otherwise we waste time here.

C: Can we have a vote?

A: This is not a technical discussion, so I would not want to go there.

C: Do you mean this is a procedural motion and you are going to decide it yourself?

A: No. I am not deciding myself. I’m asking the members that have worked on these topics and that they have requested the motion that made it to the SFD in this topic to either be the POC or select the POC. In the beginning, we had multiple members that wanted to be POC, and we asked those members to converge into a single POC. But that didn’t work. So, to solve this deadlock, whoever has requested the motion for that topic, based on his expertise and familiarity with members to reach that consensus, may be or select the POC.

C: I am neutral. It seems that you are not quite getting consensus in the procedure you have. When I was calling for a vote, I meant to vote of the whole working group everybody on this call. I see on the chat one person is OK with the chair deciding it. If this is a procedural motion, you do have the right under the IEEE 802.11 policies and procedures to decide yourself. If you decide to do that, I have no objection. But I think you either need to decide it yourself or put it to a vote of the full group with the voting tool.

A: This has been ongoing for more than 2 weeks now and there has not been consensus among the members as to how to converge into a set of POCs. As a chair, I have a target to have a POC. The group could not converge on their own in a set of POCs. Hence, I had a call with the task group leadership on Tuesday how to make progress on this. And we agreed to have a metric and use that metric to select the member that wants to be a POC or that wants to select a POC. The metric is going to release this burden from any single member, including me. I think it is a good metric to have the members that have worked hard into making progress and reaching consensus on those topics to also be able to select the POC or become a POC. I think that is more than fair and that’s what we’re doing now. That’s why the members that requested the straw polls and the motions that have worked with all these members at TTT as the basis of this metric. We also discussed this at the task group leadership level.

C: The chair, the vice chairs and also the editor had a meeting scheduled by the chair. At that meeting the 11bn leadership team decided to make a procedure. And finally, we agree with this procedure. In the PHY, I speak based on a lot of experience and so on. Let’s just keep the procedure. Because we tried all the other options and it did not work. The procedure was not decided by the chair himself. We have the discussion at the task group leadership level and that’s the decision we make.

A: Because members didn’t agree, we came up with the procedure.

C: Going with the procedure and the metric.

(POC: Matthew Fisher)

* + - Multi-AP Coordination Framework

C: I would like to be the POC since I have not only run the motion but also contributed and raised them the issue of the unified framework for multi-AP coordination from November 2023 and also in the SG. So, I would like to be the POC and work with all the other TTT members.

C: Going with the procedure and the metric.

(POC: Arik Klein)

* + - Coordinated Spatial Reuse

C: Last time I volunteered for the CSR POC and Jason also volunteered. But in order to separate the task, I would like to be this POC.

C: I have been proposing the CSR since many years ago. I also did a lot of simulation and even field tests to show the performance gain of this scheme. So, I would most likely be the POC of this feature.

A: There is no convergence but motion 29 was run by Jason. I take Jason to be the POC.

C: Going with the procedure and the metric.

(POC: Jason Yuchen Guo)

* + - C-TDMA

C: I support Sanket to be the POC. He has been involved in discussion with many members by the past several months to harmonize and worked on the protocols. So, he will do a good job in continuing the work with all the members

C: Going with the procedure and the metric.

(POC: Sanket Kalamkar)

* + - Co-RTWT

C: Rubayet has been on this topic for several years and had a lot of contribution in TGbe. I think he would be the perfect candidate to lead this.

C: I think there was no convergence last time but I would like to volunteer myself.

C: We had like some initial e-mail but in fact there was no convergence. I really acknowledge all the work that Rubayet has done for this topic. He has provided may contribution. In the past year, I’ve been very present and organized discussion for consensus and brought the motion. I would like to confirm myself as the POC.

C: Based on the rule that Giovanni was run the motion. We are not using another metric whether the first five or ten supporting document are from like any other specific person or whoever pushed it into the previous amendment.

C: I’ve been working on it for three, four years. It doesn’t matter whoever is running like a person came say last month. We all supported the meeting. If this is the selecting rule based on convenience, I’ll go with because they support you, trust you.

A: Basically, please work with everybody. The metric is one of those choices so that we move forward. But it is really appreciated that you guys are going to work together.

C: Why do you make the first exception? The motion made by Jason. It is already inside the POC of coordinated beamforming. And then you divided that topic into two subtopics.

A: What we did, except I asked Jason explicitly, “Are you OK to have you as the MAC the POC and PHY POC?” And Jason indicated that he is fine.

C: Since CBF is the first topic, so I don’t know what is going for other topics. But as we go, we see that for other topics are just following the rule that if there is no consensus, then we should let the people who run the motion to take to the POC if the people if the people who run the motion doesn’t want to take the POC or is not so qualified to take the POC, he/she could point out someone who is more qualified to be the POC. So, if we follow the same rule as all the other topics, then I think coordinated beamforming is not fair. I agree with some of the members saying that I’m more on MAC and didn’t much job on PHY. So, I would like to point someone who is more suitable.

A: My question to Jason was, “Is what I said correct that he wants to divide between MAC and PHY?” Let me ask you again one more time, “Is it correct that I asked you to choose whether you want to split into MAC and PHY?” Because I wantthe record to be straight.

C: It is not same for other topics, right?

A: Nothing is changing in terms of rules or anything. Everything is done according to what we are discussing.

C: If we do the same thing for other topics, then I would like to change, maybe a little bit change on this topic.

A: You would like to change based on some information that you received on coordinated beamforming. The decision is made but we can follow up with offline as to why this change.

C: I just want to make the rule clear and make this could be fair to each other. He would like to be the POC of the whole topic. Can we do this?

A: No. I’m going to check with Jason how this sudden change in terms of his opinion is made.

(POC: Giovanni Chisci)

* + - In-Device Coexistence

C: I suggested to be the POC for this one but none of them responded.

C: Going with the procedure and the metric.

(POC: Laurent Cariou)

* + - TWT SP management

C: I sent an email to the reflector but I did not get any responses.

C: I might miss your e-mail. I just want to mention that for this topic. I see Kumal has passed the motion but it is about some indication in TWT SP management. This topic is very large, but the past motions just focused on specific parts of it.

If we assign the whole topic to a single person relied on the motion passed, that might limit new things to be added to this topic.

A: If something new comes to the SFD text by another motion, those thoughts are going to be added to the spec text. So please don't think of this as the POC limiting somehow what is going to be added in the specs and is not reflective of the SFD.

C: I didn’t hear that the motion passed would affect the assignment of POC earlier. I heard this rule for the first time in this meeting.

A: We have to make a rule for making progress on certain things, and that is why to discuss these rules because the group itself is not reaching consensus. I can guarantee that the task group can guarantee not to limit anything.

C: But would the POC decide?

A: The POC is not going to limit anything. Everything is made on the task group level.

C: I have discussed this topic in TGbe and TGbn as well. Then I have past experiences in TWT and RTWT in 11be. I would like to work with all the members to work on this topic.

C: Going with the procedure and the metric.

(POC: Kumail Haider)

* + - Control (ICF/ICR)

C: I support Liwen would do the POC.

C: I would like to volunteer the POC.

C: I am still OK to be the POC. I have a bunch of contribution of ICF here with the support motions.

C: Going with the procedure and the metric.

(POC: Liwen Chu)

* + - MLME SAP

(POC: Yan Li)

* + - UHR MAC Capabilities element

(POC: Ming Gan)

* + - UHR Operation Element

(POC: Ming Gan)

* + - UHR BSS Operation

(POC: Ming Gan)

* + - Block Ack

(POC: Ming Gan)

* + - Introduction to UHR MAC

C: There is no convergence so far. I am willing to be the POC but want to hear from other thought.

C: I’ glad to do it.

(POC: George Cherian)

* + - Block Ack

C: There is no motion passed on it. What are we enhancing or changing in Block Ack? I don’t think this topic needs to be there. There is no enhancement to Block Ack procedure. We just refer to the existing procedure in current baseline, I am not clear what we are.

A: If there is no motion in the entity that no essentially a referral to this baseline. But that is the expectation for all these top classes that are not going to have new changes in the SFD.

C: If you look at the 11be, we add like procedures. The reason is that to this subclause of original 11ax is certainly related to the PPDU format newly introduced in 11bn. We need to redefine that clarification of like not procedure. Now we have UHR PPDU in 11bn. So, I assume we need a subclause.

A: If we were to change to “Acknowledgement procedure”, would there be any further questions?

C: I think that is better.

C: I have another comment for the PPDU format, the bandwidth, MCS and ELR selection rules in each generation are defined. So, we need to have this subclause.

A: Because it is going to be a new addition, so we'll add it. We'll let members to go over it and think about it, and then we can ask some to see volunteers and POC for this part.

(POC: Ming Gan)

<Joint topics>

* + - Trigger Frame for UHR

C: I don’t think there is any convergence.

A: If there are no consensus, does it mean that the people will try to run the first motion to find out the POC later?

A: Alfred: OK: Yes, we will entertain selecting the POC once there is an approved motion. First by asking the members to agree by themselves on a POC, else we can come up with another metric to select such a POC.

C: To avoid undesired incentives for future selections, I suggest we change the metric from here on. Otherwise, it will create some unwanted behavior.

A: This metric that we use right now is just being done for today. For subsequent decisions, as always, I hope that members reach the consensus by themselves. If there is no consensus, we are going to come with another metric as per discussions within the task group leadership, and that metric may very well be different. I request the secretary to put it in the minutes so that we are all aware.

C: I would like to support Alice as the POC for this topic. I believe she will be a good candidate for this and I can move to the TTT for this topic.

C: I have many contributions related to trigger frames such as EHT variant, user info field, AID in trigger, MRU and other. I’m not sure why you are saying Alice is more experienced in this trigger frame. And what I want to say is that who run the first motion is the POC, is not a good idea. Because I also have some trigger frame related motion, straw polls in TGbn. But I don’t think we achieve agreements on the DRU distribution bandwidth and the DRU signaling.

A: That is answer from the previous question but I think this is not converged. Could you please gray out then we can have discussions when the topic is reactivated.

* + - NDP announcement

C: I have been the NDPA POC for the last two years in 11bn. And the POCs should not have the same person for multiple topics. This would make it if the names in suggested for the POC and they already have other topics, we could have a discussion offline for the remaining names and suggest one and come up with the POC at the next time.

C: Sounding procedure and NDPA are quite related topics. I would suggest to combine them and then having one POC.

A: I guess there is no conclusion and mark in gray.

* + - Nominal Packet padding values selection rules>

(POC: Mengshi Hu)

* + - PICS (Annex B)

(POC: Edward Au)

* + - MAC and PHY MIB (Annex C)

C: For these MIB and Annex C, this will depend on individual features we develop. Wouldn't be handled as part of those features like we populate the MIB?

A: There are some things that needs to be handled by one member, because we have new variable that are related to UHR itself and a lot of those there. I think it is a good idea but this is my personal opinion.

(POC: Li Quan)

* + Summary of discussion and remarks on the POC assignment from the TGbn chair
    - Thanks everybody. It is very difficult process that there has been a lot of work from everybody on this task. We really appreciate all the work of the SFD.
    - The POC is going to coordinate to work. Please do work with all the TTTs so that the spec text is with a very good quality and aligned with the SFD.
    - I always hope that to the members first convergence. If they don’t, then I will meet again with the task group leadership to entertain another new metric. And as a chair, I think this is the fairest approach that we can take.
* Straw Polls
  + **SP1 (Sanket)-CTDMA:**

Do you agree that, as part of the C-TDMA procedure, a candidate AP that is polled by the sharing AP shall provide, via a response,

* + - Its intention not to participate in TXOP sharing during the current TXOP.
    - Its intention to participate in TXOP sharing during the current TXOP.
    - Signaling details (including traffic indication) are TBD.

*Supporting documents:* [*11-23/1895*](https://mentor.ieee.org/802.11/dcn/23/11-23-1895-02-00bn-c-tdma-frame-sequence.pptx)*,* [*11-24/0423*](https://mentor.ieee.org/802.11/dcn/24/11-24-0423-00-00bn-nav-rules-in-c-tdma.pptx)*,* [*11-24/1016*](https://mentor.ieee.org/802.11/dcn/24/11-24-1016-02-00bn-c-tdma-follow-up-additional-details-on-framing-sequence.pptx)*,* [*11-24/1017*](https://mentor.ieee.org/802.11/dcn/24/11-24-1017-00-00bn-mechanism-for-txop-return-in-c-tdma.pptx)*,* [*11-24/1225*](https://mentor.ieee.org/802.11/dcn/24/11-24-1225-00-00bn-initial-control-frames-in-c-tdma.pptx)

C: I assume that you are talking about sharing AP. Is this response done for a request that was done earlier?

A: No. This is the part of the TXOP, not before.

C: OK. If it’s in the TXOP, this response specifically. Do you mean ICR?

A: Yes.

C: I would suggest to replace “via a response” to “via ICR”.

A: That should be OK.

C: Why do we use this only for C-TDMA procedure? It can be generally for not only C-TDMA procedure. I would suggest to remove it from the main straw poll text and put a not that it can be for C-TDMA.

A: I think other features can also have their own procedure. What I am talking here is only about C-TDMA. We could add other features. I don’t intend to cover all the features. That is why I have restricted myself to C-TDMA in this straw poll.

C: OK. Your intention is just to cover it to open widely.

C: You want to define that there is an ICF and the ICF exchange at the beginning of the TXOP. So, there instruction is to collect the intention of their shared AP to want to participate or not. I think it is more like the BSRP and BSR frame exchange before their upload OFDMA transmission. But I think in the 11ax, BSRP and frame exchange is more like an optional feature. In this straw poll, do you want to define such a similar frame exchange as an optional or mandatory feature?

C: There are the next level details. It is just we are having a mechanism here to enhance this response so that using this response by the form the candidate AP, the sharing AP can make a good decision, whom to share the TXOP and all that. The neediest AP will get the TXOP and then we can meet the goal of the C-TDMA to reduce the latency of traffic and so on. That is the motivation. But whether to make it mandatory or optional, we can discuss on that.

C: According to your straw poll text, it’s more like a mandatory feature and a

I think we should not limit such frame exchange within the current maybe we can do it before the current TXOP. Maybe we can do it before their current TXOP.

C: The requirement for the candidate AP seems a little bit strict using the share. From your perspective, is there any issue if a candidate AP does not respond, if it’s not interested in participating in the sharing?

A: That is what the first bullet said. If it is not interested, it will just may not respond. In case there is no response from the candidate AP, the sharing AP will assume that that candidate AP is not interested in TXOP sharing for the AP.

C: Even if it intends to not to participate, it shall provide the ICR?

A: In general, you can also ask that an MU-RTS station shall provide a CTS response. That doesn’t mean if the station is not available, it has to provide the response.

**Result: 81Y: 44N: 33A**

(SPs 2, 3 and 4 and the presentation on the agenda were not done due to lack of time.)

* Any other business: None.
* Adjourned at 11:57.

**Appendix**

* Attendee List for the 4th Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| TGbn | 10/10 | Erkucuk, Serhat | Ofinno |
| TGbn | 10/10 | Asterjadhi, Alfred | Qualcomm Technologies, Inc. |
| TGbn | 10/10 | Ghosh, Chittabrata | Apple Inc. |
| TGbn | 10/10 | Lou, Hanqing | InterDigital, Inc. |
| TGbn | 10/10 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/10 | Ajami, Abdel Karim | Apple Inc. |
| TGbn | 10/10 | LU, Yuxin | TCL Industries |
| TGbn | 10/10 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| TGbn | 10/10 | Asai, Yusuke | Nippon Telegraph and Telephone Corporation (NTT) |
| TGbn | 10/10 | Lorgeoux, Mikael | Canon Research Centre France |
| TGbn | 10/10 | Bai, Jiyang | TCL |
| TGbn | 10/10 | Fang, Yonggang | MediaTek Inc. |
| TGbn | 10/10 | Lim, Yeon Geun | Newracom Inc. |
| TGbn | 10/10 | Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/10 | Li, Weiyi | Spreadtrum Communication USA, Inc |
| TGbn | 10/10 | Li, Haozheng | TP-Link System Inc. |
| TGbn | 10/10 | LEE, Mingyu | Samsung Electronics Co., Ltd. |
| TGbn | 10/10 | Dezfouli, Behnam | Nokia |
| TGbn | 10/10 | Lee, Hong Won | LG ELECTRONICS |
| TGbn | 10/10 | LIU, QINGLAI | Panasonic Holdings Corporation |
| TGbn | 10/10 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| TGbn | 10/10 | Aio, Kosuke | Sony Corporation |
| TGbn | 10/10 | Manoharan, Jegan | Cisco Systems |
| TGbn | 10/10 | Eiger, Martin | Peraton Labs |
| TGbn | 10/10 | Ratnam, Vishnu | Samsung Research America |
| TGbn | 10/10 | Quan, Yingqiao | Spreadtrum Communications (Shanghai) Co., Ltd.... |
| TGbn | 10/10 | Perez, Javier | Ofinno |
| TGbn | 10/10 | Patil, Abhishek | Qualcomm Incorporated |
| TGbn | 10/10 | Ekkundi, Manasi | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Park, Sungjin | Senscomm |
| TGbn | 10/10 | Park, Minyoung | Apple Inc. |
| TGbn | 10/10 | Norouzi, Sara | Huawei Technologies Canada; Huawei Technologie... |
| TGbn | 10/10 | Noh, Si-Chan | Newracom Inc. |
| TGbn | 10/10 | Nogami, Toshizo | SHARP CORPORATION |
| TGbn | 10/10 | Naik, Gaurang | Qualcomm Technologies, Inc |
| TGbn | 10/10 | Doppler, Klaus | Nokia |
| TGbn | 10/10 | Motozuka, Hiroyuki | Panasonic Holdings Corporation |
| TGbn | 10/10 | Montreuil, Leo | Broadcom Corporation |
| TGbn | 10/10 | Montemurro, Michael | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Miwa, Shinya | Canon Research Centre France |
| TGbn | 10/10 | Di Taranto, Rocco | Ericsson AB |
| TGbn | 10/10 | Minotani, Jun | Panasonic Holdings Corporation |
| TGbn | 10/10 | McCann, Stephen | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Max, Sebastian | Ericsson AB |
| TGbn | 10/10 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Lee, Gwangho | Korea National University of Transportation |
| TGbn | 10/10 | Fischer, Matthew | Broadcom Corporation |
| TGbn | 10/10 | Koo, Jonghoe | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Inohiza, Hirohiko | Canon |
| TGbn | 10/10 | Huang, Po-Kai | Intel Corporation |
| TGbn | 10/10 | Fujimori, Yuki | Canon Research Centre France |
| TGbn | 10/10 | Gaeremynck, Robbe | IMEC |
| TGbn | 10/10 | Hu, Chunyu | Spreadtrum Communications US |
| TGbn | 10/10 | Hervieu, Lili | CableLabs |
| TGbn | 10/10 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| TGbn | 10/10 | Chung, Chulho | SAMSUNG |
| TGbn | 10/10 | Hedayat, Ahmadreza | Apple Inc. |
| TGbn | 10/10 | Choi, JinHo | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/10 | Hasabelnaby, Mahmoud | Huawei Technologies Canada; Huawei Technologie... |
| TGbn | 10/10 | Hart, Brian | Cisco Systems, Inc. |
| TGbn | 10/10 | Choi, Jinsoo | LG ELECTRONICS |
| TGbn | 10/10 | Handte, Thomas | Sony Group Corporation |
| TGbn | 10/10 | Ha, Taeyoung | Samsung Electronics Co., Ltd. |
| TGbn | 10/10 | Chu, Liwen | NXP Semiconductors |
| TGbn | 10/10 | GUIGNARD, Romain | Canon Research Centre France |
| TGbn | 10/10 | Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. |
| TGbn | 10/10 | Gu, Junrong | Clourney Semiconductor |
| TGbn | 10/10 | Gu, Jaheon | Samsung Electronics Co., Ltd. |
| TGbn | 10/10 | Chaturvedi, Abhishek | Samsung Electronics |
| TGbn | 10/10 | Kuo, Chih-Chun | MediaTek Inc. |
| TGbn | 10/10 | Cha, Dongju | LG ELECTRONICS |
| TGbn | 10/10 | Carney, William | Sony Group Corporation |
| TGbn | 10/10 | Klein, Arik | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Kishida, Akira | NTT |
| TGbn | 10/10 | baron, stephane | Canon Research Centre France |
| TGbn | 10/10 | Kim, Youhan | Qualcomm Technologies, Inc. |
| TGbn | 10/10 | Fu, Qingwei | TP-Link Systems Inc. |
| TGbn | 10/10 | Kim, Suhwook | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Kim, Sanghyun | WILUS Inc. |
| TGbn | 10/10 | Kim, Sang Gook | LG ELECTRONICS |
| TGbn | 10/10 | Kim, Jungjun | Samsung Electronics |
| TGbn | 10/10 | Baykas, Tuncer | Ofinno |
| TGbn | 10/10 | Rodriguez, Stephen | Cisco Systems, Inc. |
| TGbn | 10/10 | Kim, Jeongki | Ofinno |
| TGbn | 10/10 | Kim, Geon Hwan | LG ELECTRONICS |
| TGbn | 10/10 | Cui, Yaoshen | TP-Link Systems Inc. |
| TGbn | 10/10 | Kandala, Srinivas | Samsung |
| TGbn | 10/10 | Kamel, Mahmoud | Interdigital Inc. |
| TGbn | 10/10 | kamath, Manoj | Broadcom Corporation |
| TGbn | 10/10 | Kalamkar, Sanket | Qualcomm Incorporated; Qualcomm Technologies, Inc |
| TGbn | 10/10 | Kakani, Naveen | Qualcomm Incorporated; Qualcomm Technologies, Inc |
| TGbn | 10/10 | Kabbinale, Aniruddh | Samsung Electronics Co., Ltd. |
| TGbn | 10/10 | Jee, Anand | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Jang, Insun | LG ELECTRONICS |
| TGbn | 10/10 | Byeon, Seongho | SAMSUNG ELECTRONICS |
| TGbn | 10/10 | Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| TGbn | 10/10 | Ryu, Kiseon | NXP Semiconductors |
| TGbn | 10/10 | Strobel, Rainer | Maxlinear |
| TGbn | 10/10 | Zhou, Lei | H3C Technologies Co., Limited |
| TGbn | 10/10 | SUH, JUNG HOON | Huawei Technologies Canada; Huawei Technologie... |
| TGbn | 10/10 | Sung, Hyeonjun | WILUS Inc. |
| TGbn | 10/10 | Xu, Yanchao | Amlogic |
| TGbn | 10/10 | Taori, Rakesh | Infineon Technologies |
| TGbn | 10/10 | Zhong, Ke | Ruijie Networks Co.,Ltd. |
| TGbn | 10/10 | Zhao, Yue | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Zhao, Xuwen | TCL |
| TGbn | 10/10 | Urabe, Yoshio | Panasonic Holdings Corporation |
| TGbn | 10/10 | Val, Inaki | MaxLinear, Inc. |
| TGbn | 10/10 | Zhang, Lyutianyang | Huawei Technologies Co., Ltd. |
| TGbn | 10/10 | Wang, Qi | Apple Inc. |
| TGbn | 10/10 | Shilo, Shimi | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Wang, Ying | InterDigital, Inc. |
| TGbn | 10/10 | Zhang, Jiayi | Ofinno |
| TGbn | 10/10 | Yu, Jian | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Wee, Gaius | Panasonic Holdings Corporation |
| TGbn | 10/10 | Yoon, Yelin | LG ELECTRONICS |
| TGbn | 10/10 | Yee, James | MediaTek Inc. |
| TGbn | 10/10 | Yano, Kazuto | Advanced Telecommunications Research Institute... |
| TGbn | 10/10 | Wei, Dong | Guangdong OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/10 | Yang, Jimmy | Moxa Inc. |
| TGbn | 10/10 | Yang, Jay | ZTE Corporation |
| TGbn | 10/10 | Yang, Haorui | China Mobile |
| TGbn | 10/10 | Xia, Qing | Sony Corporation |
| TGbn | 10/10 | Yang, Hang | Ruijie Networks Co., Ltd. |
| TGbn | 10/10 | Xiao, Tong | Xiaomi Communications Co., Ltd. |
| TGbn | 10/10 | Zhang, John | Guangdong OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/10 | Shi, Zhenpeng | Huawei Technologies Co., Ltd |
| TGbn | 10/10 | Tanaka, Yusuke | Sony Corporation |
| TGbn | 10/10 | Yan, Zhongjiang | Northwestern Polytechnical University |
| TGbn | 10/10 | Schelstraete, Sigurd | MaxLinear |
| TGbn | 10/10 | Shafin, Rubayet | Samsung Electronics |
| TGbn | 10/10 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute... |
| TGbn | 10/10 | Sakamoto, Ryunosuke | SHARP CORPORATION |
| TGbn | 10/10 | Seo, Sangho | Broadcom Corporation |

* Attendee List for the 10th Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| TGbn | 10/31 | Zhao, Xuwen | TCL |
| TGbn | 10/31 | Asterjadhi, Alfred | Qualcomm Technologies, Inc. |
| TGbn | 10/31 | Fang, Yonggang | MediaTek Inc. |
| TGbn | 10/31 | Rosdahl, Jon | Qualcomm Technologies, Inc. |
| TGbn | 10/31 | Rodriguez, Stephen | Cisco Systems, Inc. |
| TGbn | 10/31 | Ratnam, Vishnu | Samsung Research America |
| TGbn | 10/31 | Quan, Yingqiao | Spreadtrum Communications (Shanghai) Co., Ltd.... |
| TGbn | 10/31 | Pettersson, Charlie | Ericsson AB |
| TGbn | 10/31 | Perez, Javier | Ofinno |
| TGbn | 10/31 | Patil, Abhishek | Qualcomm Incorporated |
| TGbn | 10/31 | Park, Sungjin | Senscomm |
| TGbn | 10/31 | Park, Minyoung | Apple Inc. |
| TGbn | 10/31 | Norouzi, Sara | Huawei Technologies Canada; Huawei Technologie... |
| TGbn | 10/31 | Noh, Si-Chan | Newracom Inc. |
| TGbn | 10/31 | Nogami, Toshizo | SHARP CORPORATION |
| TGbn | 10/31 | Ng, Boon Loong | Samsung Electronics |
| TGbn | 10/31 | Roy, Rishabh | SAMSUNG ELECTRONICS |
| TGbn | 10/31 | Ryu, Kiseon | NXP Semiconductors |
| TGbn | 10/31 | Son, Ju-Hyung | WILUS Inc. |
| TGbn | 10/31 | Schelstraete, Sigurd | MaxLinear |
| TGbn | 10/31 | Wee, Gaius | Panasonic Holdings Corporation |
| TGbn | 10/31 | Wilhelmsson, Leif | Ericsson AB |
| TGbn | 10/31 | Wu, Tianyu | Apple Inc. |
| TGbn | 10/31 | Zhong, Ke | Ruijie Networks Co.,Ltd. |
| TGbn | 10/31 | Zhao, Yue | Huawei Technologies Co., Ltd |
| TGbn | 10/31 | Wullert, John | Peraton Labs |
| TGbn | 10/31 | Xia, Qing | Sony Corporation |
| TGbn | 10/31 | Zhou, Huixuan | OPPO |
| TGbn | 10/31 | Zhang, Maolin | Huawei Technologies Co., Ltd |
| TGbn | 10/31 | Xu, Yanchao | Amlogic |
| TGbn | 10/31 | Yang, Hang | Ruijie Networks Co., Ltd. |
| TGbn | 10/31 | Yang, Jay | ZTE Corporation |
| TGbn | 10/31 | Yang, Jimmy | Moxa Inc. |
| TGbn | 10/31 | Yano, Kazuto | Advanced Telecommunications Research Institute... |
| TGbn | 10/31 | Yee, James | MediaTek Inc. |
| TGbn | 10/31 | Yoon, Yelin | LG ELECTRONICS |
| TGbn | 10/31 | Zhang, Lyutianyang | Huawei Technologies Co., Ltd. |
| TGbn | 10/31 | Zhou, Lei | H3C Technologies Co., Limited |
| TGbn | 10/31 | Wang, Ying | InterDigital, Inc. |
| TGbn | 10/31 | Wang, Qi | Apple Inc. |
| TGbn | 10/31 | Shabdanov, Samat | Mediatek |
| TGbn | 10/31 | Shafin, Rubayet | Samsung Electronics |
| TGbn | 10/31 | Shi, Zhenpeng | Huawei Technologies Co., Ltd |
| TGbn | 10/31 | Singh, Aditi | Charter Communications |
| TGbn | 10/31 | Smith, Luther | Cable Television Laboratories Inc. (CableLabs) |
| TGbn | 10/31 | SUH, JUNG HOON | Huawei Technologies Canada; Huawei Technologie... |
| TGbn | 10/31 | Sun, Bo | Sanechips Technology Co., Ltd. |
| TGbn | 10/31 | Sung, Hyeonjun | WILUS Inc. |
| TGbn | 10/31 | Tanaka, Yusuke | Sony Corporation |
| TGbn | 10/31 | Taori, Rakesh | Infineon Technologies |
| TGbn | 10/31 | Vaidya, Maulik | Charter Communications |
| TGbn | 10/31 | Val, Inaki | MaxLinear, Inc. |
| TGbn | 10/31 | Varshney, Prabodh | Nokia |
| TGbn | 10/31 | Zhou, Renlong | Sanechips Technology Co., Ltd. |
| TGbn | 10/31 | Zhou, Pei | TCL |
| TGbn | 10/31 | Wang, Hao | Tencent |
| TGbn | 10/31 | Wang, Lei | Futurewei Technologies/Huawei Technologies |
| TGbn | 10/31 | Sadiq, Bilal | Samsung Research America |
| TGbn | 10/31 | Neishaboori, Azin | General Motors Company |
| TGbn | 10/31 | Lijun, Yu | self-funded |
| TGbn | 10/31 | Motozuka, Hiroyuki | Panasonic Holdings Corporation |
| TGbn | 10/31 | Hedayat, Ahmadreza | Apple Inc. |
| TGbn | 10/31 | Hervieu, Lili | CableLabs |
| TGbn | 10/31 | Cha, Dongju | LG ELECTRONICS |
| TGbn | 10/31 | Cao, Rui | NXP Semiconductors |
| TGbn | 10/31 | Byeon, Seongho | SAMSUNG ELECTRONICS |
| TGbn | 10/31 | Ho, Duncan | Qualcomm Technologies, Inc |
| TGbn | 10/31 | Bredewoud, Albert | Broadcom Corporation |
| TGbn | 10/31 | Bankov, Dmitry | IITP RAS |
| TGbn | 10/31 | Bai, Jiyang | TCL |
| TGbn | 10/31 | Hu, Chunyu | Spreadtrum Communications US |
| TGbn | 10/31 | HUANG, CHIHAN | MediaTek Inc. |
| TGbn | 10/31 | huang, kaikai | Nokia |
| TGbn | 10/31 | Inohiza, Hirohiko | Canon |
| TGbn | 10/31 | Baek, SunHee | LG ELECTRONICS |
| TGbn | 10/31 | Asai, Yusuke | Nippon Telegraph and Telephone Corporation (NTT) |
| TGbn | 10/31 | Ajami, Abdel Karim | Apple Inc. |
| TGbn | 10/31 | Aio, Kosuke | Sony Corporation |
| TGbn | 10/31 | Inoue, Kyosuke | SHARP CORPORATION |
| TGbn | 10/31 | Jang, Insun | LG ELECTRONICS |
| TGbn | 10/31 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| TGbn | 10/31 | Mutgan, Okan | Nokia |
| TGbn | 10/31 | Chisci, Giovanni | Qualcomm Technologies, Inc |
| TGbn | 10/31 | Choi, JinHo | SAMSUNG ELECTRONICS |
| TGbn | 10/31 | Fang, Juan | Intel Corporation |
| TGbn | 10/31 | Fu, Qingwei | TP-Link Systems Inc. |
| TGbn | 10/31 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| TGbn | 10/31 | Erkucuk, Serhat | Ofinno |
| TGbn | 10/31 | Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| TGbn | 10/31 | Ghosh, Chittabrata | Apple Inc. |
| TGbn | 10/31 | Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. |
| TGbn | 10/31 | Di Taranto, Rocco | Ericsson AB |
| TGbn | 10/31 | Dezfouli, Behnam | Nokia |
| TGbn | 10/31 | Das, Subir | Peraton Labs |
| TGbn | 10/31 | GUIGNARD, Romain | Canon Research Centre France |
| TGbn | 10/31 | Gupta, Binita | Cisco Systems, Inc. |
| TGbn | 10/31 | Ha, Taeyoung | Samsung Electronics Co., Ltd. |
| TGbn | 10/31 | Cui, Yaoshen | TP-Link Systems Inc. |
| TGbn | 10/31 | Coffey, John | Realtek Semiconductor Corp. |
| TGbn | 10/31 | Chung, Chulho | SAMSUNG |
| TGbn | 10/31 | Chu, Liwen | NXP Semiconductors |
| TGbn | 10/31 | Haider, Muhammad Kumail | Meta Platforms, Inc. |
| TGbn | 10/31 | Choi, Jinsoo | LG ELECTRONICS |
| TGbn | 10/31 | Hasabelnaby, Mahmoud | Huawei Technologies Canada; Huawei Technologie... |
| TGbn | 10/31 | Jia, Boqi | Huawei Technologies Co., Ltd |
| TGbn | 10/31 | Zhang, Jiayi | Ofinno |
| TGbn | 10/31 | Kalamkar, Sanket | Qualcomm Incorporated; Qualcomm Technologies, Inc |
| TGbn | 10/31 | Lee, Wookbong | Apple Inc. |
| TGbn | 10/31 | Levy, Joseph | InterDigital, Inc. |
| TGbn | 10/31 | Li, Jialing | Qualcomm Technologies, Inc |
| TGbn | 10/31 | Li, Weiyi | Spreadtrum Communication USA, Inc |
| TGbn | 10/31 | Li, Yapu Guangdong | OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/31 | Fischer, Matthew | Broadcom Corporation |
| TGbn | 10/31 | Lim, Dong Guk | LG ELECTRONICS |
| TGbn | 10/31 | Lim, Yeon Geun | Newracom Inc. |
| TGbn | 10/31 | Lou, Hanqing | InterDigital, Inc. |
| TGbn | 10/31 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.... |
| TGbn | 10/31 | LU, Yuxin | TCL Industries |
| TGbn | 10/31 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| TGbn | 10/31 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| TGbn | 10/31 | Manoharan, Jegan | Cisco Systems, Inc. |
| TGbn | 10/31 | Minotani, Jun | Panasonic Holdings Corporation |
| TGbn | 10/31 | Monajemi, Pooya | Apple Inc. |
| TGbn | 10/31 | Montemurro, Michael | Huawei Technologies Co., Ltd |
| TGbn | 10/31 | Johnsson, Kerstin | Nokia |
| TGbn | 10/31 | LEE, JOONSOO | Newracom Inc. |
| TGbn | 10/31 | LEE, Mingyu | Samsung Electronics Co., Ltd. |
| TGbn | 10/31 | Kim, Sanghyun | WILUS Inc. |
| TGbn | 10/31 | Kedem, Oren | Maxlinear |
| TGbn | 10/31 | Lee, Hong Won | LG ELECTRONICS |
| TGbn | 10/31 | Karamyshev, Anton | self |
| TGbn | 10/31 | Kim, Jungjun | Samsung Electronics |
| TGbn | 10/31 | Kim, Jeongki | Ofinno |
| TGbn | 10/31 | Kim, Suhwook | SAMSUNG ELECTRONICS |
| TGbn | 10/31 | Kim, Geon Hwan | LG ELECTRONICS |
| TGbn | 10/31 | Kishida, Akira | NTT |
| TGbn | 10/31 | Klein, Arik | Huawei Technologies Co., Ltd |
| TGbn | 10/31 | Kamel, Mahmoud | Interdigital Inc. |
| TGbn | 10/31 | Koundourakis, Michail | Samsung Cambridge Solution Center |
| TGbn | 10/31 | Kuo, Chih-Chun | MediaTek Inc. |
| TGbn | 10/31 | Kandala, Srinivas | Samsung |