IEEE P802.11  
Wireless LANs

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| TGbn July 2024 Meeting Minutes | | | | |
| Date: 2024-09-10 | | | | |
| Author(s): | | | | |
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|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This document contains the minutes for TGbn July 2024 sessions.

Revision history:

* Rev0: First version of the document.
* Rev1: Revised the result of the counting vote and added the lists of the voting records. Fixed typos.

Abbreviations:

* C: Comment.
* A: Answer.

**July 15th, Monday (8:00-10:00 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

# July 15th, Monday (13:30-15:30 EDT) - Joint

* The Chair, Alfred Asterjadhi (Qualcomm), calls the meeting to order.
* Yusuke Asai (NTT) is serving as the Secretary.
* Registration information
  + The chair announced that registration is needed to attend this meeting.
* Meeting protocol
  + The chair announced that everyone is required to log in WebEx to vote.
  + Please ensure that the following information is listed correctly when joining the call:
    - "[voter status] First Name Last Name (Affiliation)"
* 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:
    - Joint: Yusuke Asai ([yusuke.asai@ntt.com](mailto:yusuke.asai@ntt.com)) & Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
    - PHY: Sigurd Schelstraete ([sschelstraete@maxlinear.com](mailto:sschelstraete@maxlinear.com)), Tianyu Wu ([tianyu@apple.com](mailto:tianyu@apple.com)), and Dongguk Lim ([dongguk.lim@lge.com](mailto:dongguk.lim@lge.com))
    - MAC: Xiaofei Wang ([xiaofei.wang@interdigital.com](mailto:xiaofei.wang@interdigital.com)), and Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com)), Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com))
* 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.

Copyright Policy was presented.

* + **Patent, Participation, Copyright and policy related subclause:** Please refer to the agenda document ([11-24/0976r3](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-03-00bn-tgbn-july-2024-meeting-agenda.pptx).)
* Agenda
  + Chair reviewed proposed agenda found in [11-24/0976r3](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-03-00bn-tgbn-july-2024-meeting-agenda.pptx).
  + Discussion:
    - The revision of the SP was changed as in [11-24/0976r4](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-04-00bn-tgbn-july-2024-meeting-agenda.pptx).
  + The modified agenda was approved with unanimous consent.
* Announcements
  + Please make sure that contributions are uploaded at least 24 hours prior to the scheduled session.
  + Chair started to strike out some contribution that was not uploaded by the deadline.
  + Please make sure that the attendee’s information that you listed in Webex matches that in the IEEE 802.11member list for voting validation. (Voting status, last name, first name)

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

C: How do the strike-out submission ought to be handed?

A(Chair): The submission is strike out because it was not uploaded, and it will be kept to the respective session. If there is a support to discuss on it, it can be discussed. Otherwise, it will be removed.

* Summary from May 2024 meeting
  + Ten teleconferences were held between March and May 2024 ([11-24/0964r15](https://mentor.ieee.org/802.11/dcn/24/11-24-0964-15-00bn-may-july-tgbn-teleconference-agenda.docx)).
  + The group discussed ~40 technical submissions on the calls.
  + Targets for the July plenary are as follows:
    - Presentation of technical submissions (~190 pending submissions)
    - Continue populating the TGbn SFD with approved concepts.
* Approve TG minutes
  + TG motions: Approve TG minutes from the May 2024 meeting  
    **Motion:**

**Move to approve TGbn minutes listed below:**

* + - May interim: <https://mentor.ieee.org/802.11/dcn/24/11-24-1005-00-00bn-tgbn-may-2024-meeting-minutes.docx>
    - Teleconferences May-July: <https://mentor.ieee.org/802.11/dcn/24/11-24-1133-02-00bn-tgbn-may-june-july-2024-teleconference-minutes.docx>

Move: Yusuke Asai Second: Kiseon Ryu

* + - Discussion: None.

Result: Approved with unanimous consent.

* Technical Submissions – CSR + MAP
  + Straw Poll 1:

Do you agree to add the following text to the TGbn SFD:

* + - TGbn shall define the Coordinated Buffer Status Report (C-BSR) for UHR APs.

Note 1: C-BSR is used to indicate the information on the pending traffic by an AP to its neighboring AP(s). The details of the information are TBD.

Note 2: It's TBD whether the UHR AP is an AP set (including MBSSID set or/and co-hosted BSSID set) or an individual AP.

* + - Discussion

C: The direction looks beneficial for the AP to make a better scheduling procedure.

C: I am not sure which one is the UHR AP.

A: I mean this is for the definition of UHR APs.

C: It is better to say whether the AP transmitting the C-BSR in an UHR AP set.

C: What you wrote in the Note 1 essentially defines the mechanism to share the information of the pending traffic by an AP.

A: How about the C-BSR is used to indicate the information of the pending traffic.

C: Do you want to change it to your resource needs, right? It is a resource request I mean, mostly I am thinking about C-TDMA. It is going to be a time request and has nothing to do with the traffic.

A: In my contribution, my aim is to define the C-BSR to represent the resource needs for assisting multi-AP coordination.

C: Maybe new name would be better I think in my opinion.

C: All your experience here has similar suggestion that the buffer so that you report to resources request. most likely medium term is better.

A: Thank you. My intention is to define buffer status report.

C: If you would like the sharing AP to allocate the time to the shared AP, it would be better to inform the time resources directly. That is my comment.

(The modified straw poll text after discussion. Note 2 was changed.)

Do you agree to add the following text to the TGbn SFD:

* + - TGbn shall define the Coordinated Buffer Status Report (C-BSR) for UHR APs.

Note 1: C-BSR is used to indicate the information on the pending traffic by an AP to its neighboring AP(s). The details of the information are TBD.

Note 2: It's TBD whether the UHR AP transmitting C-BSR is in an AP set (including MBSSID set or/and co-hosted BSSID set) or an individual AP.

Result: Y: 26%, N: 45%, A: 28% (total 209) -> (\*Estimated count: Y:55, N:95, A:59)

\*Note: At the timing of this straw poll, the TGbn the Webex voting system only showed the percentages of Yes/No/Abstain and the number of total votes. “Estimated count” is an estimate derived backward from the original record (accuracy is not guaranteed).

C: I am curious the straw poll about the name changed.

* + Straw Poll 2:

Do you agree to add the following text to the TGbn SFD:

* + - TGbn shall **define a coordinated resource request mechanism** for UHR APs.

Note 1: **The signaling** is used to indicate the information on the pending traffic by an AP to its neighboring AP(s). The details of the information are TBD.

Note 2: It's TBD whether the UHR AP is an AP set (including MBSSID set or/and co-hosted BSSID set) or an individual AP.

* + - Discussion

C: What does the traffic by UHR AP mean? Does it include all of the pending traffic for all of the STAs?

A: It includes both of downlink and uplink traffic.

C: The signaling is used to indicate information of the pending traffic by an AP to its neighboring APs or by your AP to its neighboring APs, does that make sense?

C: The previous SP one, we updated Note 2, but I am seeing the old Note 2 for the straw poll 2. Please fix it.

The presenter was requested to cast the revised straw poll text to the reflector for review. The SP2 was deferred.

* + The other straw polls are deferred.
  + [11-24/0635r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0635-00-00bn-coordinated-spatial-re-use-and-coordinated-spatial-nulling-follow-up.pptx): Coordinated Spatial Re-Use and Coordinated Spatial Nulling Follow-Up

Rainer Strobel (MaxLinear)

C: In the slide 6, many users of the C-SR seem pretty suffering from low throughput. For example, the red curve shows about 25 % of the user at zero throughput.

I just want to understand that if C-SR is enabled to the video users will suffer, but in the slide 5 that compares to C-SR and C-BF, I don’t see much benefit from C-SR. It seems that CBF does not have any kind of this problem. I don’t see any needs to support C-SR.

A: The aggregate rates of C-SR are still good overall, but on the individual STA rate you see this portion here where like some 25% of the STAs suffer. This is because power optimization is always unfair. If you do an unfair optimization, you give nothing to some stations which are placed unluckily as shown in the right one in the slide 6.

C: If you don’t do a good power optimization for C-SR, then the system will suffer, I understand.

C: In the slide 9, you have a requirement of +-0.07 ppm, did you derive this timing? Is this just for the timing error to satisfy this condition, or does this also include the frequency error requirement?

A: This requirement is mainly from the timing point of view. Offset will be translated into the timing offset, and if this time offset exceeds the time synchronization range, it causes harmful effect for the spatial nulling.

C: If this is the time offset and CP (cyclic prefix), I think you just don’t want to the timing of the overall beyond the CP of 8 microseconds, right?

A: Yes.

C: What is your definition of a coordinated spatial reuse? I think we do not have really definition. I have not seen that clearly from your slides.

A: In the coordinated spatial reuse, we measure the interference between the access points and the associated and unassociated stations then try to find transmit power and adjust it.

C: I do not know how to compare these coordination schemes. Because the first one adjusts transmit power over the same frequency resource, but the latter one utilized quite a lot of information in terms of timing and spatial kind of information.

A: (Chair asked the commentor to send an email to clarify the point.)

* + [11-24/0839r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0839-00-00bn-system-level-evaluation-of-coordinated-spatial-reuse.pptx): System-Level Evaluation of Coordinated Spatial Reuse

Kosuke Aio (Sony Corporation)

C: If I see the definition of negotiation without power control, both of the AP use the maximum transmit power. I wonder whether the CSR without power control has less optimized. Why does the CSR perform only 5 % gain in that case.

A: In the case of negotiation only, I agree with the sharing AP use only maximum transmit power. But in such a case, the benefit of the negotiation is that the sharing AP can use the proper MCS, which results in 5% gain, I think.

C: In the slides 9, 7, and 11, you presented the CDF for the throughput. Is that aggregated throughput over the two APs or only one single AP?

A: I showed in the appendix. This graph shows the CDF for the throughput per station.

C: We are also doing this kind of simulation. The preliminary results are similar.

C: In your simulation, you put two APs out of ED range but within the PD range.

When the AP coordination is successful, the shared AP uses coordinated MCS. But you are saying that the other AP will transmit a frame if we see the PD-wise CCA and not transmitted. Can you clarify a little bit what the only negotiation mode means?

A: Typically, regular MCS is set to SNR level that is because the OBSS stops their transmission. But in some cases, the AP prefers to set lower MCS because of the collision.

C: Is the AP just to detect signal from sharing AP just based on PD or something? I am seeing the shared AP drops its MCS because of a negotiation, then the shared AP will just be some PD to determine whether or not transmit a frame.

A: In this simulation scenario, the AP can detect the PD level but not ED level.

* + [11-24/0720r](https://mentor.ieee.org/802.11/dcn/24/11-24-0720-02-00bn-map-co-cac-follow-up.pptx)2: MAP Co-CAC follow up Jay Yang (ZTE)

C: In the slide 4, the ETSI rules says that the master device may rely on another device, associated with the master, and then you are talking about two APs being able to use this rule. The APs are not associated to each other, so this would not be allowed this rule. Are you sure this rule applies to two APs? I think you need to check that out.

A: Thank you for your comment.

C: What is the security model here? Why would one AP trust another AP? There could have rogue APs. What is the trust model here?

A: For example, some authentication between APs to guaranteed by using AP coordination scheme may be needed.

C: Multi-AP coordination protocol can only authenticate the message. It does not authenticate the actual transport. Something is needed to think about for the authentication.

C: In the slide 7, the signal between two APs is shown. I assume these two APs are on the same channel since the AP1 is on non-DFS channel so AP2 is also. How does th3 AP2 get this CAC

information?

A: For example, the AP1 request that it is going to ask the AP2 to switch the channel to the target channel for CAC. Then the AP2 goes back to the channel after finishing the operation. After the CAC of one minute, the AP2 reports the result of the CAC to the AP1.

* + [11-24/0941r](https://mentor.ieee.org/802.11/dcn/24/11-24-0941-00-00bn-txop-sharing-group-shared-ap-selection.pptx)0: TXOP Sharing Group – Shared AP Selection Klaus Doppler (Nokia)

C: I agree with the point that the sharing AP needs to get information. Are you thinking that the sharing group is more like a static allocation of a certain set of APs?

A: It is a static allocation. It is not for per TXOP.

C: Do you say that we will always have a set of shared APs?

A: That is my thought. This would make sense because the AP is not moving around. And unless we dynamically change the primary channel, this would mean that the APs works sometimes at the list present in the vicinity and other channels. That would mean a semi-static group.

C: Are you then thinking that this group will have its own identity or something, or it’s something that they are sharing APs decides that this is my set of shared APs that I will be checking it?

A: Having a mechanism to establish a TXOP sharing group and adding and subtracting APs to the group are definitely something that I can see. That is useful mechanism and to make this work.

C: My question is a little bit higher level than just purely TXOP sharing. Because I think all the TXOP sharing is the idea that a particular AP first obtains a TXOP and then determines based on the need to give to a part of it to another APs, which has a benefit for low latency traffic.

However, even looking at general, I guess time-based coordination is not a little more efficient for stations and communicate their expected needs and then determining on a higher level of how to share that medium time. I am just curious about your thought.

A: I think it is a very good observation. Evaluating the different options and comparing them are probably the best ways to do this. For example, if I have three APs sharing the same channel, it is not completely clear at the beginning of the TXOP how much time I actually need for this transmission because I still need to pull my own stations. So, I don’t know how much of low latency traffic and what types of the traffic are mixed. In that sense, sharing with two other APs and doing the handover of the TXOP is likely the most efficient one and will work really well. So, I can see a scenario where this scheme will perform best and where we will see the benefit because it also gets much more opportunities to latency traffic in that way. I think this is beneficial.

C: Regarding duration of the TXOP sharing, if we have to do the block ACK request, if the shared APs which request to use the shared AP’s duty would try to negotiate retransmission, that may take this kind of duration very tough, if that is possible in your mechanism.

A: When there are four APs, I can put the shared TXOP to all of those four APs at the same. It is not the multi-AP coordination group. It is just about the TXOP sharing.

C: I think the maximum duration of the TXOP has to be carefully designed based on the number of shared APs. Is that correct?

A: Yes. Of course, it depends on many things such as how many STAs, how many data, and how many shared APs and so on. For example, if the shared AP needs at least 3 ms to transmit or receive its own data and has 2 ms left, it makes sense to have the 5 ms of the TXOP. If it is more dynamic, I would pick a shorter period, but this really depends on the traffic.

C: In the slide 7, I am curious how to assign different subchannels to two different APs. How does the respective STA receive the PPDU on the subchannel? Does that mean two APs have to send same preamble at the beginning of the PPDU?

A: That is a really good question.

* AoB: None.
* Recessed at 15:29.

**July 15th, Monday (16:00-18:00 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
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**July 16th, Tuesday (13:30-15:30 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

**July 17th, Wednesday (8:00-10:00 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

**July 17th, Wednesday (10:30-12:30 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

**July 17th, Wednesday (16:00-18:00 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

**July 18th, Thursday (8:00-10:00 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

**July 18th, Thursday (10:30-12:30 EDT)**

* Split PHY and MAC sessions.
  + PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-1287-01-00bn-minutes-for-tgbn-phy-ad-hoc-sessions-in-july-2024-plenary.docx>
  + MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-1269-00-00bn-minutes-for-tgbn-mac-ad-hoc-sessions-in-july-2024-plenary.docx>

# July 18th, Thursday (13:30-15:30 EDT) - Joint

* The Chair, Alfred Asterjadhi (Qualcomm), calls the meeting to order.
* Yusuke Asai (NTT) is serving as the Secretary.
* Registration information
  + The chair announced that registration is needed to attend this meeting.
* Meeting protocol
  + The chair announced that everyone is required to log in WebEx to vote.
  + Please ensure that the following information is listed correctly when joining the call:
    - "[voter status] First Name Last Name (Affiliation)"
* 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:
    - Joint: Yusuke Asai ([yusuke.asai@ntt.com](mailto:yusuke.asai@ntt.com)) & Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
    - PHY: Sigurd Schelstraete ([sschelstraete@maxlinear.com](mailto:sschelstraete@maxlinear.com)), Tianyu Wu ([tianyu@apple.com](mailto:tianyu@apple.com)), and Dongguk Lim ([dongguk.lim@lge.com](mailto:dongguk.lim@lge.com))
    - MAC: Xiaofei Wang ([xiaofei.wang@interdigital.com](mailto:xiaofei.wang@interdigital.com)), and Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com)), Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com))
* 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.

Copyright Policy was presented.

* + **Patent, Participation, Copyright and policy related subclause:** Please refer to the agenda document ([11-24/0976r11](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-11-00bn-tgbn-july-2024-meeting-agenda.pptx).)
* Agenda
  + Chair reviewed proposed agenda found in [11-24/0976r11](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-11-00bn-tgbn-july-2024-meeting-agenda.pptx).
  + Discussion:
    - A request to change the presentation order was raised and applied.
    - A couple of requests were raised to defer the SP1\* SP2\* (on the slide 65 in [11-24/0976r11](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-11-00bn-tgbn-july-2024-meeting-agenda.pptx)) as in the original agenda.
  + The modified agenda was approved with unanimous consent.
* Submissions (Channel Access)
  + Straw Poll 1:

Do you agree to define a mechanism in 802.11bn that enables a non-AP STA to indicate that it does not have further pending traffic to deliver during the current ongoing TWT SP.

* + - NOTE 1 – The exact signaling mechanism is TBD, and existing frames and fields may be used with suitable modifications
    - NOTE 2 – The SP does not propose changing the SP termination mechanism/signaling itself. As per current spec, a TWT SP may be terminated by an AP as specified in 26.8.5
    - NOTE 3 – It is optional for the non-AP STA to provide such an indication

Supporting doc: 24/408r0

* + - Discussion

C: I am speaking in favor of this SP. We discussed this topic in 11be and something needs to be done.

C: I am not sure about the behavior of the STA that follows the R-TWT SP. You said the STA has to be awake during the SP, I am not quite sure if that is the exact steps. And it is seemed that the STA has right to go sleep even during the SP. So, even before the SP, it seems like the STA can already go to sleep. Do we need this mechanism?

A: That is the current setup that either the STA has to stay awake until the end of the SP or there is some signaling defined in 26.8. Unless any of those signaling happened from the AP, the STA has to stay awake until that kind of a SP after.

C: Regarding the wording, because you say here that it does not have further pending traffic. What if it did not have pending traffic? To remove them or to further makes it clear.

A: I am OK to remove further to the STA that is at the time of integration.

C: I am really supportive of the straw poll. I think the proposal closes the hole of the old standard.

C: Do you consider uplink or downlink traffic?

A: It is basically uplink to the AP. If there is conflict at the STA side, then it can decide to do the termination.

C: Why do we need the second half of the sentence?

A: It is OK to striking out. The signaling is TBD.

Result: Y: 58%, N: 16%, A: 27% (total 250), (via chat window): Y: +2, N: +6, A: +0.

-> \*Estimated count: Y:146, N:45, A:67.

\* Note: At the timing of this straw poll, the TGbn the Webex voting system only showed the percentages of Yes/No/Abstain and the number of total votes. “Estimated count” is an estimate derived backward from the original record (accuracy is not guaranteed).

* + [11-24/0772r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0772-01-00bn-csma-collision-analysis.pptx): CSMA Collision analysis Sigurd Schelstraete (MaxLinear)

C: I wonder you only looking at the throughput. The objective of the CSMA is not only to decrease latency. There are a lot of parameters that we need to optimize for the channel access.

A: As far as user base fairness, I have not made any changes yet. This is just an analysis. So, there is no problem with fairness and CSMA that already exists. To the point of latency, that would be an interesting analysis that just haven’t gotten past.

C: One of the lists of the problems, there is a one extra thing probably can be added to the conclusion as that increases the latency.

C: I think we also like to see more analysis on impact on individual STA.

A: they are all in this simulation use same MCS, they all have full buffer, so on average I think all STA will get in the medium.

C: Do you consider RTS/CTS protection?

A: I will provide the results with RTS/CTS on the next presentation.

C: Do you consider only downlink traffic?

A: Yes.

* + [11-24/0773r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0773-01-00bn-csma-with-enhanced-collision-avoidance.pptx): CSMA with enhanced Collision Avoidance

Sigurd Schelstraete (MaxLinear)

C: I think you should study a medium access scheme called extended non-primary multiple access, and it describes in a sense, where we will have it here. You have first backoff here, after which you are transmitting the signal, and the signal has variable length. Once you have stopped to transmit, you will be listening on the medium. When you detect that the medium is occupied, you have been removed from the backoff procedure because somebody else has expected the channel. I think this is the right way to look at this because we need to be open minded. And I total agree with we have to have backward compatibility. We seem to be having not more central control, but the amount of EDCA or AP-initiated traffic seems to be at the same level as it used to be in the past. But it would also encourage you to look at this technology.

A: It is interesting to see a similar concept actually are working on the technologies.

C: You are now looking at uplink traffic. But we need to also address the imbalance between uplink and downlink contention.

C: How is the prioritization of the traffic done on this scheme?

A: We have a review here for just one AP and one to twenty STAs that are nothing balanced. What are we going to look at most congestion and collision due to congestion.

C: What is the behavior to change the CW?

A: In the slide 8, there are the STAs that get eliminated at different times. For instance, the STA4 did get access to the medium. In this case, a lot of STAs just recontend with the same CW.

C: What if there are hidden nodes? Considering a simple example, there is an AP in the middle and the STAs on the left and right section.

A: There is nothing for the hidden STA. CSMA itself does not help to hidden STAs.

C: How does the STA know winning in the contention?

A: It doesn’t know whether there is a collision or not.

C: Have you considered RTS/CTS?

A: RTC/CTS is an overlay MAC protocol that can be used as well.

C: I am curious about the backward compatibility issues. I was wondering what is going to be the impact of a sequence of short packets that is for a legacy station. What kind of behavior is expected?

A: The standard requires that an STA should be able to detect L-STF within 4 us. So, legacy station will go to packet detect. Although it does not know what is going on, it will try to go back to the next phase of the preamble to try to cross-correlation and hopefully decide that this was not the packet.

C: I am curious about 2nd and 3rd round contention window in your simulation.

A: The main condition is that the maximum length of back around should be shorter than the shortest AIFS voice. Typically, this is like three or four spots.

C: I am wondering about the behavior in a mixed scenario where there are some legacy stations operating in simultaneously with some new STAs. The expectation is that it has frequency of collisions. What are your expectations in the scenario?

A: The legacy STAs will recognize the STF field and find the rest of the phase and set its state machine and look for the next phase.

C: Based on my understanding, in addition to transmitting the small amount of data, the STAs needs to be able to hear each other’s transmission. That means the time slots are probably longer than a standard time operation. How does the alignment and hearing from each other work here?

A: No. The time slots are 9 us and the signals of S-TSF is 8 us. There is no data that we just read it.

C: The STAs still need to hear from each other. And every one of those time slots is possible that two stations need to switch from Rx to Tx and again. In the slide 8, four STAs collide with each other.

A: The stations 1, 4 and 5, they will notice that the first one is going to be used to that slot could be used for a UHR STA.

C: If we do not consider using RTS/CTS, it can be the major factor.

A: As I said, my statement was to see if we can improve CSMA as it is.

* + [11-24/0840r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0840-00-00bn-hip-edca-proposal.pptx): Low latency channel access Dmitry Akhmetov (Intel)

C: Improving latency in the next generation is a very important thing. In the side 3, we assume there is trying to exploit our smartly leverage some behavior that was designed and put inside legacy devices. I am pretty sure at the time where it was being put that intention was not to be used like this. We should be sure that these legacy devices are very capable of behaving like this. We should be sure that there is no way that those stations are unintentionally or intentionally disrupted. If you try to scale this technique, you will start to see situations where there will be a lot of devices. It would be very difficult to push somebody off the channel. Have you also thought about those aspects?

A: At the beginning, you should use the legacy EDCA and you should try to announce the priority only when it is needed. In your particular example, it is potentially there might be cases for multiple devices going to be sending DSs but then you have to ask yourself why you are getting in that situation. Maybe your network is already oversaturated.

C: On the 3rd bullet in the slide 20, you want the low latency traffic to be treated as traffic in current implementation so that a lot of limitation.

A: (Chair asked to send an e-mail for the commentor’s question.)

C: In the slide 3, you assume that offset freedom devices that have received these colliding frames would turn to EIFS. But EIFS usage in the market is questionable. In addition, you have second backoff period. If that leaves a gap larger than 25 microseconds, you might have other technologies jumping in because we do not know what enough is.

A: It depends on how successful devices and depends on the network topology, transmit power, et cetera., you may get nothing, you may get NAV. We are hoping that is in most of the cases and simulation shows that immature.

* + [11-24/1183r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1183-01-00bn-low-latency-low-collision-low-power-medium-access-continued.pptx): Low latency, low collision, low power medium access—continued

Sean Coffey (Realtek)

* + - The presentation was conducted.
    - Q+A session was scheduled to the next session (PM2, Thursday).
* Recessed at 15:30.

# July 18th, Thursday (16:00-18:00 EDT) - Joint

* The Chair, Alfred Asterjadhi (Qualcomm), calls the meeting to order.
* Yusuke Asai (NTT) is serving as the Secretary.
* Registration information
  + The chair announced that registration is needed to attend this meeting.
* Meeting protocol
  + The chair announced that everyone is required to log in WebEx to vote.
  + Please ensure that the following information is listed correctly when joining the call:
    - "[voter status] First Name Last Name (Affiliation)"
* 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:
    - Joint: Yusuke Asai ([yusuke.asai@ntt.com](mailto:yusuke.asai@ntt.com)) & Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
    - PHY: Sigurd Schelstraete ([sschelstraete@maxlinear.com](mailto:sschelstraete@maxlinear.com)), Tianyu Wu ([tianyu@apple.com](mailto:tianyu@apple.com)), and Dongguk Lim ([dongguk.lim@lge.com](mailto:dongguk.lim@lge.com))
    - MAC: Xiaofei Wang ([xiaofei.wang@interdigital.com](mailto:xiaofei.wang@interdigital.com)), and Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com)), Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com))
* 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.

Copyright Policy was presented.

* + **Patent, Participation, Copyright and policy related subclause:** Please refer to the agenda document ([11-24/0976r12](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-12-00bn-tgbn-july-2024-meeting-agenda.pptx).)
* Agenda
  + Chair reviewed proposed agenda found in [11-24/0976r12](https://mentor.ieee.org/802.11/dcn/24/11-24-0976-12-00bn-tgbn-july-2024-meeting-agenda.pptx).
  + Discussion
    - A request to defer the SP2 was raised and removed.
  + The modified agenda was approved.
* Motion
  + [11-24/0171r11](https://mentor.ieee.org/802.11/dcn/24/11-24-0171-11-00bn-tgbn-motions-list-part-1.pptx): TGbn Motions List Part 1.
  + Motion 21 (PHY)

Move to add the following text to the TGbn SFD:

* + - If a DRU for a PPDU occupies more than one 20 MHz channel, then the L-STF, L-LTF, L-SIG, and RL-SIG fields are duplicated over all the 20 MHz channels which are occupied by the DRU.

Reference documents: [[24/0736r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0736-01-00bn-preamble-and-pe-transmission-in-ppdu-using-dru.pptx)]. SP result: 51Y, 2N, 15A.

Move: Yapu Li Second: Ross J. Yu

* + - Discussion: None.

Result: Approved with unanimous consent.

* + Motion 22 (PHY)

Move to add the following text to the TGbn SFD:

* + - “PHY version identifier” is set to 1 in U-SIG for UHR PPDUs

Reference documents: [[24/0876r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0876-00-00bn-uhr-ppdu-phy-version.pptx)]. SP result: 112Y, 4N, 17A.

Move: Jianhan Liu Second: Ross J. Yu

* + - Discussion

C: There will be a mix of clients, Wi-Fi 6, 7 and 8 for many years later. It’s easy to mention that this motion says that the only way of taking advantage of UHR feature is to transmit UHR PPDUs. I think it will be a mistake in the industry because essentially, you’ve got too much in the early days production of legacy clients, you’ve got a UHR AP and a UHR station, and most of the time you are not going to be used for UHR features. You are going to use VHT or even HT OFDM use. When we don’t confine on a PHY features into UHR PPDUs, we can retrofit those features into VHT or HT. I just wanted to point out that this motion does not exclude retrofitting existing Wi-Fi.

A: I just agree was not here. E.g., VHT device does not understand UHR features. So, you set up the VHT to ignore the UHR support. You can do the UHR devices to pretend to be VHT devices.

C: For example, there are an UHR AP, one UHR STA and dozens or hundreds of VHT STAs. So, I would love to see a benefit of UHR feature, but almost always the right choice is the UHR using VHT 40 PPDU, which I don’t get to use any of the report.

This is not a good way to deploy technology.

(Recording vote was requested.)

C: I think whatever we proposed and discussed will be helpful for the RU level flexibility.

C: I think this is good proposal to move forward by finding out what is helpful.

~~Preliminary Result: Y:174, N:16, A:64.~~

Result: Y:167, N:16, A:59. Passed.

* + Motion 23 (PHY)

Move to add the following text to the TGbn SFD:

* + - Define unequal modulation over different spatial streams

Reference documents: [[24/0474r2](https://mentor.ieee.org/802.11/dcn/24/11-24-0474-02-00bn-uhr-unequal-modulation-pattern-and-new-mcs.pptx)]. SP result: 116Y, 4N, 9A.

Move: Rui Cao Second: Rethna Pahulikkoonattu

* + - Discussion: None.

Result: Approved with unanimous consent.

* + Motion 24 (PHY)

Move to add the following text to the TGbn SFD:

* + - Define Enhanced Long Range (ELR) PPDU and potentially other Range Extension mechanisms.

Reference documents: [[24/0873r2](https://mentor.ieee.org/802.11/dcn/24/11-24-0873-02-00bn-design-targets-and-considerations-for-enhanced-long-range.pptx)]. SP result: 118Y, 7N, 16A.

Move: Wook Bong Lee Second: Shengquan Hu

* + - Discussion: Recording vote was requested.

~~Preliminary Result: Y:177, N:12, A:44.~~

Result: Y:174, N:11, A:41. Passed.

* + Motion 25 (PHY)

Move to add the following text to the TGbn SFD:

* + - Define LDPC codeword length larger than 1944, including 2x1944

Reference documents: [[23/1985r5](https://mentor.ieee.org/802.11/dcn/23/11-23-1985-05-00bn-longer-ldpc-codeword.pptx)]. SP result: 113Y, 3N, 20A.

Move: Rethna Pulikkoonattu Second: Sameer Vermani

* + - Discussion: None.

Result: Approved with unanimous consent.

* + Motion 26 (MAC)

Move to add the following text to the TGbn SFD:

* + - Define in 11bn that when a non-AP MLD is in the process of roaming from the current AP MLD to a target AP MLD, the context related to the non-AP MLD is transferred to the target AP MLD such that it preserves the data exchange context for the non-AP MLD or the context can be renegotiated with the target AP MLD
      * Details on what context can be transferred and what context can be renegotiated are TBD
      * How to transfer the context is TBD.

Note: Reference documents: [[23/1971](https://mentor.ieee.org/802.11/dcn/23/11-23-1971-02-00bn-further-thoughts-on-seamless-roaming.pptx), [23/1996](https://mentor.ieee.org/802.11/dcn/23/11-23-1996-00-00bn-improve-roaming-between-mlds.pptx), [24/0052](https://mentor.ieee.org/802.11/dcn/24/11-24-0052-00-00bn-seamless-roaming-details.pptx), [24/0083](https://mentor.ieee.org/802.11/dcn/24/11-24-0083-01-00bn-smooth-roaming-follow-up-2.pptx), [24/0101](https://mentor.ieee.org/802.11/dcn/24/11-24-0101-03-00bn-mld-roaming.pptx), [24/0396](https://mentor.ieee.org/802.11/dcn/24/11-24-0396-02-00bn-seamless-roaming-within-a-mobility-domain-follow-up.pptx), [24/0412](https://mentor.ieee.org/802.11/dcn/24/11-24-0412-01-00bn-seamless-roaming-procedure-follow-up.pptx), [24/0679](https://mentor.ieee.org/802.11/dcn/24/11-24-0679-01-00bn-thoughts-on-functionality-and-security-architecture-for-uhr-seamless-roaming.pptx)]. SP result: 153Y, 22N, 37A.

Move: Giovanni Chischi Second: Binita Gupta

* + - Discussion: Counting vote was requested.

~~Preliminary Result: Y:197, N:6, A:26.~~

Result: Y:193, N:6, A:25. Passed.

* + Motion 27(MAC)

Move to add the following text to the TGbn SFD:

* + - As part of the seamless roaming procedure, during roaming,
      * after the request/response exchange that initiates notification of the DS mapping change from the current AP MLD to the target AP MLD,
        + The current AP MLD may deliver buffered DL data frames for a TBD period of time.
        + The non-AP MLD may retrieve buffered DL data frames from the current AP MLD
        + The non-AP MLD may send UL data to target AP MLD.
        + It is assumed that the target AP MLD is able to deliver data frames to non-AP MLD after the DS mapping change
      * The current AP MLD may forward DL data to the target AP MLD.
        + When and how to initiate the forwarding of DL data is TBD

Reference documents: [[23/1971](https://mentor.ieee.org/802.11/dcn/23/11-23-1971-02-00bn-further-thoughts-on-seamless-roaming.pptx), [23/1996](https://mentor.ieee.org/802.11/dcn/23/11-23-1996-00-00bn-improve-roaming-between-mlds.pptx), [24/0052](https://mentor.ieee.org/802.11/dcn/23/11-23-1996-00-00bn-improve-roaming-between-mlds.pptx), [24/0083](https://mentor.ieee.org/802.11/dcn/24/11-24-0083-01-00bn-smooth-roaming-follow-up-2.pptx), [24/0101](https://mentor.ieee.org/802.11/dcn/24/11-24-0101-03-00bn-mld-roaming.pptx), [24/0396](https://mentor.ieee.org/802.11/dcn/24/11-24-0396-02-00bn-seamless-roaming-within-a-mobility-domain-follow-up.pptx), [24/0412](https://mentor.ieee.org/802.11/dcn/24/11-24-0412-01-00bn-seamless-roaming-procedure-follow-up.pptx), [24/0679](https://mentor.ieee.org/802.11/dcn/24/11-24-0679-01-00bn-thoughts-on-functionality-and-security-architecture-for-uhr-seamless-roaming.pptx), [23/1884](https://mentor.ieee.org/802.11/dcn/23/11-23-1884-02-00bn-seamless-roaming.pptx), [24/934](https://mentor.ieee.org/802.11/dcn/24/11-24-0934-00-00bn-seamless-roaming-based-on-ft-protocol.pptx)]. SP result: Y:136, N:11, and A:32.

Move: Po-kai Huang Second: Jay Yang

* + - Discussion: None.

Result: Approved with unanimous consent.

* + Motion 28 (MAC)

Move to add the following text to the TGbn SFD:

* + - Define in 11bn that a non-AP MLD can gather information on candidate AP MLD(s) over the DS via the current AP MLD

Reference documents: [[24/0349r3](https://mentor.ieee.org/802.11/dcn/24/11-24-0349-03-00bn-enhanced-fast-bss-transition.pptx), [24/0679r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0679-01-00bn-thoughts-on-functionality-and-security-architecture-for-uhr-seamless-roaming.pptx), [24/0934](https://mentor.ieee.org/802.11/dcn/24/11-24-0934-00-00bn-seamless-roaming-based-on-ft-protocol.pptx)]. SP result: 125Y, 34N, 38A.

Move: Guogang Huang Second: Jay Yang

* + - Discussion:

C: The main functionality here is for the non-AP MLD to gather candidate AP MLD information through the current 11be.How an AP MLD provides certain information is really an implementation detail.

C: This in mandating architecture. If we are scared of scanning information and prepares patient, that is a good way.

C: It is already in the current spec and if we remove the over DS, there is not any difference from the baseline, I think.

C: I don’t think over the DS is logically in the wrong place here. There is just much better way to write this.

C: There is a way to reword it. We are the current AP MLD and in the bracket. If you want to keep that over the DS part, but I think right how it does not even read properly.

C: We don’t need to run because what you said is already allowed in the current spec.

~~Preliminary Result: Y:146, N:58, A:40.~~

Result: Y:143, N:55, A:39. Failed.

* + Motion 29 (MAC)

Move to add the following text to the TGbn SFD:

* + - Define a multi-AP Coordinated Spatial Reuse at TxOP-level with power control
    - Define multi-AP Coordinated Beamforming
    - Other multi-AP coordination modes are TBD

Reference documents: [[22/1822r0](https://mentor.ieee.org/802.11/dcn/22/11-22-1822-00-0uhr-recap-on-coordinated-spatial-reuse-operation.pptx), [23/0325r0](https://mentor.ieee.org/802.11/dcn/23/11-23-0325-00-0uhr-coordinated-spatial-reuse-for-uhr.pptx), [23/0776r1](https://mentor.ieee.org/802.11/dcn/23/11-23-0776-01-0uhr-performance-of-c-bf-and-c-sr.pptx), [23/1023r2](https://mentor.ieee.org/802.11/dcn/23/11-23-1023-02-0uhr-coordinated-spatial-reuse-in-a-4-ap-topoplogy.pptx), [23/1037r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1037-00-0uhr-performance-of-coordinated-spatial-reuse.pptx), [23/1832r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1832-00-00bn-multi-ap-coordinated-spatial-reuse.pptx), [23/1917r0](https://mentor.ieee.org/802.11/dcn/23/11-23-1917-00-00bn-coordinated-spatial-reuse.pptx), [24/0095r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0095-00-00bn-efficient-coordinated-spatial-reuse-follow-up.pptx), [24/0529r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0529-01-00bn-coordinated-spatial-reuse-discussion.pptx), [24/0577r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0577-00-00bn-thoughts-on-coordinated-spatial-reuse-c-sr.pptx), [24/0635r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0635-00-00bn-coordinated-spatial-re-use-and-coordinated-spatial-nulling-follow-up.pptx), [24/0639r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0639-00-00bn-mac-protocol-aspects-of-multi-ap-coordination.pptx), [24/0640](https://mentor.ieee.org/802.11/dcn/24/11-24-0640-00-00bn-consideration-on-c-sr-types.pptx), [24/0839r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0839-01-00bn-system-level-evaluation-of-coordinated-spatial-reuse.pptx), [24/0880r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0880-00-00bn-cbf-recap-and-way-forward.pptx), [24/1204r0](https://mentor.ieee.org/802.11/dcn/24/11-24-1204-00-00bn-coordinated-beamforming-for-11bn.pptx), [24/1211r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1211-01-00bn-coordinated-bf-goodput-discussion.pptx)]. SP result: 173Y, 27N, 28A.

Move: Jason Y. Guo Second: Okan Mutgan

Discussion: Recorded vote was requested.

~~Preliminary Result: Y:199, N:17, A:24.~~

Result: Y:195, N:17, A:22. Passed.

* + Motion 30 (MAC)

Move to add the following text to the TGbn SFD:

* + - define a mechanism for a non-AP STA to report unavailability at TxOP level and define or reuse/update existing mechanism for a non-AP STA to report long term (periodic) unavailability

Move: Abdel K. Ajami Second: Yong Liu

* + - Discussion: None.

Result: Approved with unanimous consent.

* + Motion 31 (MAC)

Move to add the following text to the TGbn SFD:

* + - 11bn defines a mechanism that enables a non-AP STA to indicate that it does not have pending traffic to deliver during the current ongoing TWT SP.
      * NOTE 1 – The exact signaling mechanism is TBD
      * NOTE 2 – This does not propose changing the SP termination mechanism/signaling itself. As per current spec, a TWT SP may be terminated by an AP as specified in 26.8.5
      * NOTE 3 – It is optional for the non-AP STA to provide such an indication

Move: Kumail Haider Second: George Cherian

* + - Discussion

C: Does the straw poll say that it doesn’t change the SP termination?

A: Yes.

Result: Approved with unanimous consent.

* Straw Poll
  + The SP1 was deferred.
* Technical Submissions: Channel Access
  + [11-24/1183r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1183-01-00bn-low-latency-low-collision-low-power-medium-access-continued.pptx): Low latency, low collision, low power medium access—continued

Sean Coffey (Realtek)

(Continued from the previous session (PM1, Thursday))

C: I just want to clarify if this chirp mechanism only helpful for the duration of RTS or CTS duration?

A: No. I don’t think it is only during RTS/CTS. I mean you could use it instead.

C: It is just an extra option you could do. I think it is chirping mechanism because if I know I do the EDCA, I don’t know the STA before sending interrupted or not.

A: An example of the motivation is the uplink STA. You are trying to get access to the medium and you are worried about the fact that bother presented to each and every station. One thing you can do is to try to send it. We are better avoiding detecting long PPDU. We are not taking away RTS.

* + [11-24/0811r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0811-01-00bn-overlapped-indication-for-aperiodic-low-latency-traffic.pptx): Overlapped-indication-for\_aperiodic-Low-latency-traffic

Daniel Verenzuela (Sony Group Corporation)

C: Regarding your overlap indication, could you specify what is the specific signal?

A: I introduced this in my previous contribution. This signal as I use it now is essentially a collection of plus ones and minus one modulated into the data tones of the ongoing PPDU for a few OFDM symbols.

C: So, for the longer you basically need 32 symbols of indication. Does that carry data itself or just an indication?

A: Just an indication.

C: Are 32 symbols normally used to indicate the existence of this?

A: Yes. In this case, the indication is basically expanded over 32 symbols.

C: In the slide 5, the station with low latency indication wants the access point to either trigger or something to happen for the low latency data or to be transmitted. Can you explain what is going to happen if the AP does not receive the indication or the low latency STA gets triggered the anytime soon?

A: Basically, the indication is sent by the low latency station and its station cannot do anything but to wait for the AP. It cannot do anything. It will need to try to contend TXOP.

C: Are you going to bring yourself a subsequent contribution to explain how things will work in the bigger picture, a lot of stations?

A: This is something that definitely we haven’t been considered. I would be interested in this.

C: As the previous response on the question, the AP does not specify which station sends the signals. There is at least one station that has low latency data. Do you have any idea about how to identify this station?

A: The indication would actually find the station. There will basically be some sort of pre-agreement with the AP and low latency stations, so that the AP will identify these stations.

C: For example, this is the difference in power or the number of symbols?

A: This indication would be basically spread across different tones and classified as blocks. Just to give an example, if you would have a pattern that we know by the AP, we know that these are in response to a particular station.

C: Encoding modulation on the existing OFDM symbols?

A: This is basically a pattern, that will be divided, for example, types of LTF. So, you can have different combination of plus or minus one and you may have a different idea.

C: In the slide 5, what I am noticing here is that low latency STA sending this overlapping indication. And then, the STA1 does not have any saying. What is going to happen the next?

A: This needs to be allowed, so the latency STA needs to have some sort of indication that is says OK, you can actually use this feature. It would be the TXOP holder and it would decide to enable this operation.

C: Are you assuming something in the preamble is saying that this PPDU is preamble?

A: Something like that. It could be for example, the beginning of the EXOP, some indications sent by the station.

* + [11-24/0984r0](https://mentor.ieee.org/802.11/dcn/24/11-24-0984-00-00bn-epcs-priority-access-for-additional-use-cases.pptx): EPCS Priority Access for Additional Use Cases

Subir Das (Peraton Labs)

C: In use case II, it is not clear who would be deciding or who would be the high-class users that priority. And the low-class users will be kicked out?

A: If you see this user authorized, it is the network provider who will have that information. If there are our list of uses, then it will be indicated within the authorization, for example. Or it is operator’s choice how they will differentiate based on the use cases.

C: In the use case I, I am not what process you are suggesting?

A: The idea is that if you recall that the current feature what we have, the device is station is authenticated, then it invokes the PCS. When an emergency occurs, what the normal users, the civilians can also be limited to personal power and influence the same network, then the wandering condition occurs. In that case, everyone will try to associate. The idea is that these personnel should actually get some level of priority.

C: What I understand is that until the station is associated, we do not know it is any EPCA station.

A: We can discuss offline how the network provides us some messages and you are correct.

C: Do you mean prioritization by STA or by flow?

A: It is per STA level.

C: What is the additional enhancement related to the 11bn?

A: In 11be, the EPCS session can only get the after it is attached to the network, that means successfully authenticated and associated. So, the first thing is because what we are saying is that before association happens in authentication, there are initial message like authentication and association message. Those messages will not go through then it will basically not be able to attach to the network.

* Teleconference Plan
  + The teleconferences schedules will be announced after July IEEE F2F meeting.
  + The teleconference will be scheduled twice per week except the next week of IEEE F2F meeting and holidays.
* Goals for September 2024
  + Discuss technical submissions.
  + Continue populating the TGbn SFD.
* Any Other Business: None.
* Adjourned at 17:51.

**Appendix**

* The record of the voting result for Motion 22

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name / Affiliation | | Yes | No | Abs. | Validation Check |
| Yanbin Sun | | X |  |  |  |
| [V] Hui Luo, Infineon | |  |  | X |  |
| [V] Azin Neishaboori, GM | | X |  |  |  |
| [V] Jerome Henry, Cisco | |  | X |  |  |
| [V] Charlie Pettersson, | |  |  | X |  |
| Anuj Batra | | X |  |  |  |
| [V] Karim Nassiri Toussi, BRCM | | X |  |  |  |
| [V] Frank Chien-Fang Hsu, Mediatek | | X |  |  |  |
| Tianyu Wu | | X |  |  |  |
| Ahmed Helmy | | X |  |  |  |
| Neel Nurani Krishnan | | X |  |  |  |
| [V] Guido R. Hiertz, Ericsson GmbH | |  | X |  |  |
| Leo Montreuil | | X |  |  |  |
| [V] Rethna Pulikkoonattu, Broadcom Inc | | X |  |  |  |
| [V] Eunsung Jeon, Samsung | | X |  |  |  |
| Nima Namvar | |  |  | X | INVALID VOTE |
| [V] Pooya Monajemi, Apple | | X |  |  |  |
| Qi Wang | | X |  |  |  |
| Nehru Bhandaru | | X |  |  |  |
| [V] Joonsoo, Newracom | |  |  | X |  |
| [V] George Cherian | | X |  |  |  |
| Aditi Singh | |  |  | X |  |
| [V] Anton Karamyshev, IITP RAS | | X |  |  |  |
| [V] Tony Zeng | | X |  |  |  |
| [V] Lei Wang, Futurewei/Huawei | | X |  |  |  |
| [V] Yonggang Fang | | X |  |  |  |
| [V] Xiangxin Gu, Spreadtrum | | X |  |  |  |
| orange3644@gmail.com | |  |  | X | INVALID VOTE |
| Xiaofei Wang | |  |  | X |  |
| [V] Insik Jung, LGE | | X |  |  |  |
| [V]Kazuyuki Tota Canon | | X |  |  |  |
| Maulik Vaidya | |  |  | X |  |
| [V] Sang Kim LGE | | X |  |  |  |
| Chris Young | | X |  |  |  |
| [V] Patrice NEZOU | |  |  | X |  |
| [V] Hassan Omar, Huawei | |  |  | X |  |
| Sindhu Verma | | X |  |  |  |
| (CableLabs) Lili Hervieu | |  |  | X |  |
| Sangho Seo | | X |  |  |  |
| [V] Kazunobu Serizawa, ATR | |  |  | X |  |
| [V] Heejung Yu, Korea Univ. | | X |  |  |  |
| [V] Sebastian Max | |  |  | X |  |
| Wook Bong Lee | | X |  |  |  |
| [V] Sara Norouzi | | X |  |  |  |
| Taori Rakesh | |  |  | X |  |
| [V] Yan Zhang, Apple | | X |  |  |  |
| [v] Yuki Tsujimaru | | X |  |  |  |
| [V] Shuntaro Suzuki, Yamaha | | X |  |  |  |
| [V] Leonardo Lanante, Ofinno | | X |  |  |  |
| [V] Thomas Derham | | X |  |  |  |
| Mehdi Ganji | |  |  | X |  |
| Subir Das | |  |  | X |  |
| [V] Shubhodeep Adhikari Broadcom | | X |  |  |  |
| [V] Carl Kain (Noblis; USDOT) | |  |  | X |  |
| Yong Liu | | X |  |  |  |
| [V] Dong Wei | | X |  |  |  |
| [V] Yajun Cheng, Xiaomi | |  |  | X |  |
| [V]Hanqing Lou, InterDigital | | X |  |  |  |
| [V] Tuncer Baykas, Ofinno | | X |  |  |  |
| Menzo Wentink | |  |  | X |  |
| [V] Alice Jialing Li Chen | | X |  |  |  |
| [V] Vytas Kezys, HaiLa | |  |  | X |  |
| Lalit Garg | | X |  |  |  |
| [V] Jinho Choi, Samsung Electronics | | X |  |  |  |
| [V] Prabodh Varshney | | X |  |  |  |
| Paul Cheng | | X |  |  |  |
| [V] Takuhiro Sato, Sharp | |  |  | X |  |
| [V] Yan Xin, Huawei | | X |  |  |  |
| [V] Akira Kishida | |  |  | X |  |
| [V] Osama Aboul-Magd | |  |  | X |  |
| [V] Vyacheslav Loginov, IITP RAS | | X |  |  |  |
| [V] Aiguo Yan - Samsung | |  | X |  |  |
| [V] Abdel Karim Ajami, Apple Inc. | | X |  |  |  |
| [V] Duncan Ho | | X |  |  |  |
| [V] Mahmoud Kamel | |  |  | X |  |
| [V] Rainer Strobel, MaxLinear | |  | X |  |  |
| [V] Yelin Yoon, LGE | | X |  |  |  |
| [V] Martin Eiger, Peraton Labs | |  |  | X |  |
| [V] Junbin Chen, TP-Link | |  |  | X |  |
| [V] Vinko Erceg, Broadcom | | X |  |  |  |
| Jarkko Kneckt | | X |  |  |  |
| [V] Serhat Erkucuk, Ofinno | | X |  |  |  |
| Yanjun Sun | | X |  |  |  |
| [V] Jeongki Kim, Ofinno | | X |  |  |  |
| [V] Henry Tzu-Hsuan Chou | | X |  |  |  |
| [NV] Mrugen Deshmukh, InterDigital | |  |  | X | INVALID VOTE |
| [V] Okan Mutgan, Nokia | |  | X |  |  |
| [V] Jonghoe Koo, Samsung Electronics | |  |  | X |  |
| [V] Srinivas Kandala Samsung | |  |  | X |  |
| Julia Feng | | X |  |  | INVALID VOTE |
| [V] ChaoYi Wu, Samsung | |  |  | X |  |
| [V] Carol Ansley, Cox | |  |  | X |  |
| [V] Giovanni Chisci, Qualcomm | | X |  |  |  |
| [V] Ilya Levitsky, IITP RAS | | X |  |  |  |
| [V] Der-Zheng Liu, Realtek | | X |  |  |  |
| Gary Anwyl | | X |  |  |  |
| [V] Junyoung Nam, Qualcomm | | X |  |  |  |
| [V] Naveen Kakani | | X |  |  |  |
| Li Ma | | X |  |  |  |
| [N] Manideep Dunna | | X |  |  | INVALID VOTE |
| [V] Ray Yang, InterDigital | |  |  | X |  |
| Pelin Salem | |  | X |  |  |
| Sigurd Schelstraete | |  | X |  |  |
| [V] Timothy Jeffries - Futurewei | | X |  |  |  |
| [V] Yapu Li | | X |  |  |  |
| [V] Yusuke Asai, NTT | |  |  | X |  |
| Ali Raissinia | | X |  |  |  |
| [V] Ross Jian Yu Huawei | | X |  |  |  |
| [V] Eugene Baik, Qualcomm | | X |  |  |  |
| [V] Greg White [CableLabs] | |  |  | X |  |
| [PV]Seung Ho Choo, Senscomm | | X |  |  |  |
| Morteza Mehrnoush | | X |  |  |  |
| Xuming Wu （Huawei） | | X |  |  |  |
| [V] Youhan Kim, Qualcomm Technologies, Inc. | | X |  |  |  |
| Jianhan Liu | | X |  |  |  |
| [V] Sherief Helwa, Qualcomm Technologies Inc. | | X |  |  |  |
| Binita Gupta | |  | X |  |  |
| [V] Sanket Kalamkar | | X |  |  |  |
| [V] David Boldy, Broadcom | | X |  |  |  |
| [V] Stephane Baron, | | X |  |  |  |
| Shengquan Hu | | X |  |  | INVALID VOTE |
| Nan Cheng，XiDian University | | X |  |  |  |
| [V] Gaurang Naik, Qualcomm Technologies, Inc. | | X |  |  |  |
| [V] Mikael LORGEOUX Canon | | X |  |  |  |
| [V] Gaurav Patwardhan, HPE | |  | X |  |  |
| James Yee | | X |  |  |  |
| [PV] Yuki Yoshikawa | | X |  |  | INVALID VOTE |
| [V] Jaheon Gu, Samsung Electronics | | X |  |  |  |
| [V] Mahmoud Hasabelnaby, Huawei | | X |  |  |  |
| Chung-Ta Ku | | X |  |  |  |
| Oren Kedem [Maxlinear] | | X |  |  |  |
| [V] Abhishek Patil | | X |  |  |  |
| [PV] Renlong Zhou,Sanechips | |  |  | X |  |
| [V] Ying Wang, InterDigital | | X |  |  |  |
| [V] Juan Fang, intel | | X |  |  |  |
| Brian Hart | |  | X |  |  |
| [V] Romain GUIGNARD Canon | |  |  | X |  |
| [V] Bin Tian | | X |  |  |  |
| [V] William Li (Spreadtrum-US) | |  |  | X |  |
| [V] HUI CHE, Ruijie | | X |  |  |  |
| Ke Zhong | |  |  | X |  |
| [V] Seongho Byeon, Samsung Electronics | |  |  | X |  |
| [V] Julien Sevin, Canon | | X |  |  |  |
| [V] Jason Yuchen Guo | | X |  |  |  |
| [V] Salvatore Talarico - Sony | |  |  | X |  |
| Srinath Puducheri Sundaravaradhan | | X |  |  |  |
| Chunyu Hu | |  |  | X |  |
| [V] Inaki Val, MaxLinear | |  | X |  |  |
| [V] Qing Xia, Sony | |  |  | X |  |
| [V] William Carney, Sony | | X |  |  |  |
| [V] Kanke Wu, apple | | X |  |  |  |
| [V] Arik Klein | | X |  |  |  |
| Alvin Hsu (徐永平) | | X |  |  | INVALID VOTE |
| [V] Yaoshen Cui, TP-Link | | X |  |  |  |
| [V] Daniel Verenzuela | | X |  |  |  |
| [V] Hiroyuki Motozuka, Panasonic | | X |  |  |  |
| [V] Michail Koundourakis, Samsung | |  | X |  |  |
| AN NGUYEN [CISA] | |  |  | X |  |
| [V] BIAN Tong, Panasonic | | X |  |  |  |
| [V] Saju Palayur - Maxlinear | |  | X |  |  |
| [V] Yue Zhao Huawei | | X |  |  |  |
| [V] Atsushi Shirakawa, Sharp | | X |  |  |  |
| [V] Zhongjiang Yan, Northwestern Polytechnical University | | X |  |  |  |
| [V] Lan Peng | | X |  |  |  |
| [V] Olubukola Adakeja, Teradyne | |  |  | X |  |
| [V] You-Wei Chen, Mediatek | | X |  |  |  |
| [V] Li-Hsiang Sun, Mediatek | | X |  |  |  |
| [PV] Manasi Ekkundi, Samsung Electronics | | X |  |  |  |
| [V] Zhenguo Du | | X |  |  |  |
| [V] Insun Jang | | X |  |  |  |
| [V] Eunsung Park LGE | | X |  |  |  |
| [V] Pascal Viger, Canon | | X |  |  |  |
| [V] Hiromichi Tomeba, sharp | | X |  |  |  |
| [V] Guogang Huang Huawei | | X |  |  |  |
| [V] VK Jones | | X |  |  |  |
| [V] HanGyu Cho/LGE | | X |  |  |  |
| [V]Abhijit Bhattacharya, Qualcomm | | X |  |  |  |
| [V] Ning Gao, OPPO | | X |  |  |  |
| [V] Helene Ralle | | X |  |  |  |
| [V] Shinya MIWA, Canon | | X |  |  |  |
| [V] Hongwon Lee, LG | | X |  |  |  |
| [V] SunHee Baek LGE | | X |  |  |  |
| [V] Po-Kai Huang Intel | | X |  |  |  |
| [V] Yingqiao Quan, Spreadtrum | | X |  |  |  |
| [V] Jinsoo Choi LG | | X |  |  |  |
| [v] Jay Yang [ZTE] | |  |  | X |  |
| [V] Kazuto Yano, ATR | |  |  | X |  |
| [V] George Chih-Chun Kuo, Mediatek Inc. | |  |  | X |  |
| [V] Dongguk Lim | | X |  |  |  |
| [V] Dongju Cha, LGE | | X |  |  |  |
| [V] Mor Reich, HUAWEI | |  |  | X |  |
| Malcolm Smith | | X |  |  |  |
| [V] Thomas Handte, Sony | |  |  | X |  |
| [v] Xiandong Dong-xiaomi | |  |  | X |  |
| [V] GeonHwan Kim, LGE | | X |  |  |  |
| [V] Chaoming Luo, OPPO | | X |  |  |  |
| [PV] Yuxin Lu | |  |  | X |  |
| [V] Hank ChiHan Huang | | X |  |  |  |
| [V] Pei Zhou, TCL | |  |  | X |  |
| Yusuke Tanaka | | X |  |  |  |
| [V] Mengshi Hu | | X |  |  |  |
| [V] Shawn(Sanghyun) Kim, WILUS Inc. | |  |  | X |  |
| [V] Mingyu Lee, Samsung Electronics | | X |  |  |  |
| [V] Rubayet Shafin, Samsung Electronics | |  |  | X |  |
| [V] Tom Pare, MediaTek | | X |  |  |  |
| [V] Yuki FUJIMORI | | X |  |  |  |
| [A] Tong Xiao, Xiaomi | |  |  | X | INVALID VOTE |
| [NV] Boqi Jia, huawei | |  | X |  |  |
| [V] Liwen Chu, NXP | | X |  |  |  |
| Yunsi Ma | | X |  |  |  |
| [PV] Hui Yang, Huawei | | X |  |  |  |
| [V] Kosuke Aio, Sony | |  |  | X |  |
| [V] Kiseon Ryu, NXP | | X |  |  |  |
| [V] Niranjan Grandhe, NXP | | X |  |  |  |
| [V]Jun Minotani, Panasonic Holdings Corporation | | X |  |  |  |
| [V] Gil Rosenzweig, Renesas Electronics | |  |  | X |  |
| Pooria Pakrooh | | X |  |  |  |
| [V] Denis Bykov, NXP | | X |  |  |  |
| [V] Kumail Haider | |  |  | X |  |
| [V] Rolf de Vegt, Qualcomm | | X |  |  |  |
| [V] Lin Yang | | X |  |  |  |
| [V] Yunbo Li | | X |  |  |  |
| [V] Ryuichi Hirata | | X |  |  |  |
| [V] Yoshio Urabe, Panasonic | |  |  | X |  |
| [V] Huizhao Wang, NXP | | X |  |  |  |
| [v]Jiangwu, iTenest | |  |  | X |  |
| [V] Steven Qi Wang, Huawei | | X |  |  |  |
| [V] Karthik Srinivasa Gopalan, Samsung Electronics | |  |  | X |  |
| [V] Massinissa Lalam, Sagemcom | |  |  | X |  |
| [V] Maolin Zhang, Huawei | | X |  |  |  |
| [V] Chen-Yi Chang, MediaTek | | X |  |  |  |
| Sudhir Srinivasa | | X |  |  |  |
| [V] Bo Li Northwestern Polytechnical University | | X |  |  |  |
| [V] Oded Redlich, Huawei | | X |  |  |  |
| [V] Qinglai Liu, Panasonic | | X |  |  |  |
| [V] Ron Porat, Broadcom | | X |  |  |  |
| [v] Luis Gutierrez, Broadcom | |  |  | X |  |
| [V] Evgeny Khorov, IITP RAS | | X |  |  |  |
| [V] Hirohiko Inohiza | | X |  |  |  |
| [V] Yongsen Ma, Samsung | |  | X |  |  |
| [V] Ahmed Elsherif, Qualcomm | | X |  |  |  |
| [V] Rui Cao, NXP | | X |  |  |  |
| [V] Fangxin Xu, Longsailing Semiconductor | | X |  |  |  |
| Juan Carlos Zuniga | |  | X |  |  |
| [V] Taeyoung Ha, Samsung | | X |  |  |  |
| Mohamed Abouelseoud | | X |  |  |  |
| [V] Junghoon Suh Huawei | X | |  |  |  |
| [V] Bin Qian, Huawei | X | |  |  |  |
| [V] Matthew Fischer (Broadcom) | X | |  |  |  |
| [V] Mao Yang Northwestern Polytechnical University | X | |  |  |  |
| Dekun Liu (Huawei) | X | |  |  |  |

* The record of the voting result for Motion 24

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name / Affiliation | Yes | No | Abs. | Validation Check |
| Yanbin Sun | X |  |  |  |
| [V] Hui Luo, Infineon | X |  |  |  |
| [V] Charlie Pettersson, |  |  | X |  |
| Anuj Batra | X |  |  |  |
| Tianyu Wu | X |  |  |  |
| Ahmed Helmy | X |  |  |  |
| Neel Nurani Krishnan | X |  |  |  |
| [V] Rethna Pulikkoonattu, Broadcom Inc | X |  |  |  |
| Nima Namvar | X |  |  | INVALID VOTE |
| [V] Pooya Monajemi, Apple | X |  |  |  |
| Qi Wang | X |  |  |  |
| Nehru Bhandaru | X |  |  |  |
| [V] Joonsoo, Newracom |  |  | X |  |
| [V] George Cherian | X |  |  |  |
| Aditi Singh | X |  |  |  |
| [V] Anton Karamyshev, IITP RAS |  |  | X |  |
| [V] Tony Zeng | X |  |  |  |
| [V] Yonggang Fang | X |  |  |  |
| [V] Xiangxin Gu, Spreadtrum |  | X |  |  |
| Xiaofei Wang |  |  | X |  |
| [V] Insik Jung, LGE | X |  |  |  |
| Maulik Vaidya | X |  |  |  |
| [V] Sang Kim LGE | X |  |  |  |
| Chris Young | X |  |  |  |
| [V] Patrice NEZOU | X |  |  |  |
| [V] Hassan Omar, Huawei |  |  | X |  |
| Sindhu Verma | X |  |  |  |
| Sangho Seo | X |  |  |  |
| [V] Kazunobu Serizawa, ATR | X |  |  |  |
| [V] Heejung Yu, Korea Univ. | X |  |  |  |
| [V] Sebastian Max | X |  |  |  |
| Wook Bong Lee | X |  |  |  |
| [V] Sara Norouzi | X |  |  |  |
| Taori Rakesh | X |  |  |  |
| [V] Yan Zhang, Apple | X |  |  |  |
| [v] Yuki Tsujimaru |  |  | X |  |
| [V] Shuntaro Suzuki, Yamaha | X |  |  |  |
| [V] Leonardo Lanante, Ofinno | X |  |  |  |
| [V] Thomas Derham | X |  |  |  |
| Mehdi Ganji | X |  |  |  |
| Subir Das |  |  | X |  |
| [V] Carl Kain (Noblis; USDOT) |  |  | X |  |
| Yong Liu | X |  |  |  |
| [V] Dong Wei | X |  |  |  |
| [V] Yajun Cheng, Xiaomi |  |  | X |  |
| [V] Tuncer Baykas, Ofinno |  |  | X |  |
| Menzo Wentink | X |  |  |  |
| [V] Alice Jialing Li Chen | X |  |  |  |
| Lalit Garg | X |  |  |  |
| Jinjing Jiang | X |  |  |  |
| [V] Jinho Choi, Samsung Electronics |  |  | X |  |
| [V] Prabodh Varshney | X |  |  |  |
| [V] Takuhiro Sato, Sharp |  |  | X |  |
| [V] Akira Kishida |  |  | X |  |
| [V] Vyacheslav Loginov, IITP RAS | X |  |  |  |
| [V] Aiguo Yan - Samsung |  | X |  |  |
| [V] Abdel Karim Ajami, Apple Inc. | X |  |  |  |
| [V] Duncan Ho | X |  |  |  |
| [V] Mahmoud Kamel | X |  |  |  |
| [V] Rainer Strobel, MaxLinear |  |  | X |  |
| [V] Yelin Yoon, LGE | X |  |  |  |
| [V] Martin Eiger, Peraton Labs |  |  | X |  |
| [V] Junbin Chen, TP-Link |  |  | X |  |
| Feng Jiang | X |  |  |  |
| Jarkko Kneckt | X |  |  |  |
| [V] Serhat Erkucuk, Ofinno | X |  |  |  |
| Yanjun Sun | X |  |  |  |
| [V] Jeongki Kim, Ofinno |  |  | X |  |
| [V] Henry Tzu-Hsuan Chou | X |  |  |  |
| [V] Okan Mutgan, Nokia |  |  | X |  |
| [V] Jonghoe Koo, Samsung Electronics |  |  | X |  |
| [V] Srinivas Kandala Samsung |  | X |  |  |
| [V] Carol Ansley, Cox | X |  |  |  |
| [v] Dana Ciochina Sony | X |  |  |  |
| [V] Ilya Levitsky, IITP RAS | X |  |  |  |
| [V] Der-Zheng Liu, Realtek | X |  |  |  |
| Gary Anwyl | X |  |  |  |
| [V] Naveen Kakani | X |  |  |  |
| Li Ma | X |  |  |  |
| [V] Ray Yang, InterDigital |  |  | X |  |
| Pelin Salem | X |  |  |  |
| Sigurd Schelstraete |  | X |  |  |
| [V] Yusuke Asai, NTT |  |  | X |  |
| Ali Raissinia | X |  |  |  |
| [V] Ross Jian Yu Huawei | X |  |  |  |
| [V] Eugene Baik, Qualcomm | X |  |  |  |
| [V] Greg White [CableLabs] | X |  |  |  |
| [V] Youhan Kim, Qualcomm Technologies, Inc. | X |  |  |  |
| Jianhan Liu | X |  |  |  |
| Binita Gupta |  |  | X |  |
| [V] Sanket Kalamkar | X |  |  |  |
| [V] Stephane Baron, | X |  |  |  |
| [V] Gaurang Naik, Qualcomm Technologies, Inc. | X |  |  |  |
| [V] Mikael LORGEOUX Canon | X |  |  |  |
| [V] Gaurav Patwardhan, HPE |  | X |  |  |
| James Yee | X |  |  |  |
| [V] Jaheon Gu, Samsung Electronics | X |  |  |  |
| [V] Mahmoud Hasabelnaby, Huawei | X |  |  |  |
| Chung-Ta Ku | X |  |  |  |
| Oren Kedem [Maxlinear] |  | X |  |  |
| [V] Abhishek Patil | X |  |  |  |
| [V] Ying Wang, InterDigital | X |  |  |  |
| [V] Juan Fang, intel | X |  |  |  |
| Brian Hart |  |  | X |  |
| [V] Bin Tian | X |  |  |  |
| [V] William Li (Spreadtrum-US) | X |  |  |  |
| Ke Zhong | X |  |  |  |
| [V] Seongho Byeon, Samsung Electronics | X |  |  |  |
| [V] Julien Sevin, Canon | X |  |  |  |
| [V] Salvatore Talarico - Sony | X |  |  |  |
| Srinath Puducheri Sundaravaradhan | X |  |  |  |
| Chunyu Hu |  |  | X |  |
| [V] Qing Xia, Sony |  |  | X |  |
| [V] Kanke Wu, apple | X |  |  |  |
| [V] Arik Klein | X |  |  |  |
| Alvin Hsu (徐永平) | X |  |  | INVALID VOTE |
| [V] Yaoshen Cui, TP-Link | X |  |  |  |
| [V] Daniel Verenzuela | X |  |  |  |
| [V] Hiroyuki Motozuka, Panasonic | X |  |  |  |
| [V] Michail Koundourakis, Samsung |  | X |  |  |
| [v] Eldad Perahia, HPE |  | X |  |  |
| [V] Saju Palayur - Maxlinear | X |  |  |  |
| [V] Atsushi Shirakawa, Sharp |  |  | X |  |
| [V] Zhongjiang Yan, Northwestern Polytechnical University | X |  |  |  |
| [V] Lan Peng | X |  |  |  |
| [V] You-Wei Chen, Mediatek | X |  |  |  |
| [V] Li-Hsiang Sun, Mediatek | X |  |  |  |
| [PV] Manasi Ekkundi, Samsung Electronics |  |  | X |  |
| [V] Zhenguo Du | X |  |  |  |
| [V] Insun Jang | X |  |  |  |
| [V] Eunsung Park LGE | X |  |  |  |
| [V] Pascal Viger, Canon | X |  |  |  |
| [V] Hiromichi Tomeba, sharp | X |  |  |  |
| [V] Guogang Huang Huawei | X |  |  |  |
| [V] Ning Gao, OPPO |  |  | X |  |
| [V] Helene Ralle |  |  | X |  |
| [V] Shinya MIWA, Canon |  |  | X |  |
| [V] Hongwon Lee, LG | X |  |  |  |
| [V] SunHee Baek LGE | X |  |  |  |
| [V] Po-Kai Huang Intel | X |  |  |  |
| [V] Yingqiao Quan, Spreadtrum |  |  | X |  |
| [V] Kazuto Yano, ATR | X |  |  |  |
| [V] George Chih-Chun Kuo, Mediatek Inc. |  |  | X |  |
| [V] Dongguk Lim | X |  |  |  |
| [V] Thomas Handte, Sony | X |  |  |  |
| [v] Xiandong Dong-xiaomi |  |  | X |  |
| [V] GeonHwan Kim, LGE | X |  |  |  |
| [V] Chaoming Luo, OPPO |  |  | X |  |
| [PV] Yuxin Lu |  |  | X |  |
| [V] Hank ChiHan Huang | X |  |  |  |
| [V] Pei Zhou, TCL |  |  | X |  |
| Yusuke Tanaka | X |  |  |  |
| [V] Mengshi Hu | X |  |  |  |
| [V] Shawn(Sanghyun) Kim, WILUS Inc. | X |  |  |  |
| [V] Rubayet Shafin, Samsung Electronics |  | X |  |  |
| [V] Tom Pare, MediaTek | X |  |  |  |
| [V] Yuki FUJIMORI | X |  |  |  |
| [V] Liwen Chu, NXP | X |  |  |  |
| Yunsi Ma | X |  |  |  |
| [V] Kosuke Aio, Sony | X |  |  |  |
| [V] Kiseon Ryu, NXP | X |  |  |  |
| [V] Niranjan Grandhe, NXP | X |  |  |  |
| [V]Jun Minotani, Panasonic Holdings Corporation | X |  |  |  |
| [V] Gil Rosenzweig, Renesas Electronics | X |  |  |  |
| Pooria Pakrooh | X |  |  |  |
| [V] Denis Bykov, NXP | X |  |  |  |
| [V] Rolf de Vegt, Qualcomm | X |  |  |  |
| [V] Lin Yang | X |  |  |  |
| [V] Yunbo Li | X |  |  |  |
| [V] Ryuichi Hirata | X |  |  |  |
| [V] Yoshio Urabe, Panasonic |  |  | X |  |
| [V] Huizhao Wang, NXP | X |  |  |  |
| [v]Jiangwu, iTenest | X |  |  |  |
| [V] Steven Qi Wang, Huawei | X |  |  |  |
| [V] Karthik Srinivasa Gopalan, Samsung Electronics |  |  | X |  |
| [V] Chen-Yi Chang, MediaTek | X |  |  |  |
| Sudhir Srinivasa | X |  |  |  |
| [V] Oded Redlich, Huawei | X |  |  |  |
| Dekun Liu | X |  |  |  |
| [V] Hirohiko Inohiza |  |  | X |  |
| [V] Yongsen Ma, Samsung |  | X |  |  |
| [V] Ahmed Elsherif, Qualcomm | X |  |  |  |
| [V] Rui Cao, NXP | X |  |  |  |
| Juan Carlos Zuniga | X |  |  |  |
| Mohamed Abouelseoud | X |  |  |  |
| [V] Dinakar Prabhakaran | X |  |  |  |
| [V] Laurent Cariou, Intel | X |  |  |  |
| [V] Dmitry Akhmetov, Intel | X |  |  |  |
| Santra Avik | X |  |  |  |
| [V] Hang Su Broadcom | X |  |  |  |
| [V] Jouni Malinen, Qualcomm | X |  |  |  |
| [V] Xiayu Zheng, NXP | X |  |  |  |
| Jeff J.Q. Liu | X |  |  |  |
| [V] Sameer Vermani | X |  |  |  |
| [V] Boon Loong Ng, Samsung Electronics |  |  | X |  |
| Ian Sherlock | X |  |  |  |
| [V] Jing Guo, NXP | X |  |  |  |
| Samir Khericha | X |  |  |  |
| [V] Zheng Guo,NXP | X |  |  |  |
| [V] Davide Magrin, Meta |  |  | X |  |
| SK Yong | X |  |  |  |
| [V] Matthew Fischer (Broadcom) | X |  |  |  |
| Julia Feng | X |  |  |  |
| [V] Ron Porat, Broadcom | X |  |  |  |
| [V] Bin Qian, Huawei | X |  |  |  |
| [V] Jason Yuchen Guo (Huawei) | X |  |  |  |
| [V] Junghoon Suh Huawei | X |  |  |  |
| Leo Montreuil | X |  |  |  |
| Paul Cheng | X |  |  |  |
| [V]Abhijit Bhattacharya, Qualcomm | X |  |  |  |
| [V] HanGyu Cho/LGE | X |  |  |  |
| Shengquan Hu | X |  |  |  |
| [V] Jinsoo Choi LG | X |  |  |  |
| Morteza Mehrnoush | X |  |  |  |
| [V] Guido R. Hiertz, Ericsson GmbH | X |  |  |  |
| [V] Massinissa Lalam, Sagemcom |  | X |  |  |
| [V]Hanqing Lou, InterDigital | X |  |  |  |
| [V] Frank Chien-Fang Hsu, Mediatek | X |  |  |  |
| [V] Giovanni Chisci, Qualcomm | X |  |  |  |

* The record of the voting result for Motion 26

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name / Affliiation | Yes | No | Abs. | Validation Check |
| [V] Hui Luo, Infineon |  | X |  |  |
| Anuj Batra | X |  |  |  |
| Tianyu Wu | X |  |  |  |
| Neel Nurani Krishnan | X |  |  |  |
| Leo Montreuil | X |  |  |  |
| [V] Rethna Pulikkoonattu, Broadcom Inc | X |  |  |  |
| [V] Pooya Monajemi, Apple | X |  |  |  |
| Qi Wang | X |  |  |  |
| Nehru Bhandaru | X |  |  |  |
| [V] Joonsoo, Newracom |  |  | X |  |
| [V] George Cherian | X |  |  |  |
| [V] Tony Zeng | X |  |  |  |
| [V] Yonggang Fang | X |  |  |  |
| [V] Xiangxin Gu, Spreadtrum | X |  |  |  |
| orange3644@gmail.com |  |  | X | INVALID VOTE |
| Xiaofei Wang |  | X |  |  |
| [V] Insik Jung, LGE | X |  |  |  |
| Maulik Vaidya | X |  |  |  |
| [V] Sang Kim LGE | X |  |  |  |
| Chris Young | X |  |  |  |
| [V] Patrice NEZOU | X |  |  |  |
| [V] Hassan Omar, Huawei | X |  |  |  |
| Sindhu Verma | X |  |  |  |
| (CableLabs) Lili Hervieu | X |  |  |  |
| Sangho Seo | X |  |  |  |
| [V] Kazunobu Serizawa, ATR | X |  |  |  |
| [V] Dibakar Das, Intel | X |  |  |  |
| Wook Bong Lee | X |  |  |  |
| [V] Sara Norouzi | X |  |  |  |
| Taori Rakesh |  |  | X |  |
| [V] Yan Zhang, Apple | X |  |  |  |
| [v] Yuki Tsujimaru | X |  |  |  |
| [V] Shuntaro Suzuki, Yamaha | X |  |  |  |
| [V] Leonardo Lanante, Ofinno | X |  |  |  |
| [V] Thomas Derham | X |  |  |  |
| Mehdi Ganji | X |  |  |  |
| Subir Das | X |  |  |  |
| [V] Carl Kain (Noblis; USDOT) | X |  |  |  |
| Yong Liu | X |  |  |  |
| [V] Dong Wei |  |  | X |  |
| [V] Yajun Cheng, Xiaomi |  |  | X |  |
| [V] Siukai Mak, Broadcom | X |  |  |  |
| [V]Hanqing Lou, InterDigital |  | X |  |  |
| [V] Tuncer Baykas, Ofinno | X |  |  |  |
| Menzo Wentink | X |  |  |  |
| [V] Alice Jialing Li Chen | X |  |  |  |
| Lalit Garg | X |  |  |  |
| Jinjing Jiang | X |  |  |  |
| [V] Jinho Choi, Samsung Electronics | X |  |  |  |
| [V] Prabodh Varshney | X |  |  |  |
| Paul Cheng | X |  |  |  |
| [V] Takuhiro Sato, Sharp |  |  | X |  |
| [V] Yan Xin, Huawei | X |  |  |  |
| [V] Akira Kishida | X |  |  |  |
| [V] Vyacheslav Loginov, IITP RAS | X |  |  |  |
| [V] Aiguo Yan - Samsung | X |  |  |  |
| [V] Abdel Karim Ajami, Apple Inc. | X |  |  |  |
| [V] Duncan Ho | X |  |  |  |
| [V] Mahmoud Kamel |  | X |  |  |
| [V] Rainer Strobel, MaxLinear | X |  |  |  |
| [V] Yelin Yoon, LGE | X |  |  |  |
| [V] Martin Eiger, Peraton Labs | X |  |  |  |
| [V] Junbin Chen, TP-Link | X |  |  |  |
| Jarkko Kneckt | X |  |  |  |
| [V] Serhat Erkucuk, Ofinno | X |  |  |  |
| Yanjun Sun | X |  |  |  |
| [V] Jeongki Kim, Ofinno |  |  | X |  |
| [V] Henry Tzu-Hsuan Chou | X |  |  |  |
| [V] Okan Mutgan, Nokia | X |  |  |  |
| [V] Jonghoe Koo, Samsung Electronics |  |  | X |  |
| [V] Srinivas Kandala Samsung | X |  |  |  |
| [V] Carol Ansley, Cox | X |  |  |  |
| [V] Giovanni Chisci, Qualcomm | X |  |  |  |
| [v] Dana Ciochina Sony | X |  |  |  |
| [V] Ilya Levitsky, IITP RAS |  |  | X |  |
| [V] Der-Zheng Liu, Realtek | X |  |  |  |
| Gary Anwyl | X |  |  |  |
| [V] Junyoung Nam, Qualcomm | X |  |  |  |
| [V] Naveen Kakani | X |  |  |  |
| [V] Ray Yang, InterDigital |  | X |  |  |
| Pelin Salem | X |  |  |  |
| [V] Timothy Jeffries - Futurewei | X |  |  |  |
| [V] Yusuke Asai, NTT | X |  |  |  |
| Ali Raissinia | X |  |  |  |
| [V] Ross Jian Yu Huawei | X |  |  |  |
| [V] Eugene Baik, Qualcomm | X |  |  |  |
| [V] Greg White [CableLabs] | X |  |  |  |
| Xuming Wu （Huawei） | X |  |  |  |
| [V] Youhan Kim, Qualcomm Technologies, Inc. | X |  |  |  |
| Jianhan Liu | X |  |  |  |
| [V] Sherief Helwa, Qualcomm Technologies Inc. | X |  |  |  |
| Binita Gupta | X |  |  |  |
| [V] Sanket Kalamkar | X |  |  |  |
| [V] Stephane Baron, | X |  |  |  |
| Shengquan Hu | X |  |  | INVALID VOTE |
| [V] Gaurang Naik, Qualcomm Technologies, Inc. | X |  |  |  |
| [V] Mikael LORGEOUX Canon | X |  |  |  |
| [V] Gaurav Patwardhan, HPE | X |  |  |  |
| James Yee | X |  |  |  |
| [V] Jaheon Gu, Samsung Electronics | X |  |  |  |
| [V] Mahmoud Hasabelnaby, Huawei | X |  |  |  |
| Chung-Ta Ku | X |  |  |  |
| Oren Kedem [Maxlinear] | X |  |  |  |
| [V] Abhishek Patil | X |  |  |  |
| [V] Ying Wang, InterDigital |  |  | X |  |
| [V] Juan Fang, intel | X |  |  |  |
| Brian Hart | X |  |  |  |
| [V] Bin Tian | X |  |  |  |
| [V] William Li (Spreadtrum-US) | X |  |  |  |
| Ke Zhong | X |  |  |  |
| [V] Seongho Byeon, Samsung Electronics | X |  |  |  |
| [V] Julien Sevin, Canon | X |  |  |  |
| [V] Jason Yuchen Guo | X |  |  |  |
| [V] Salvatore Talarico - Sony | X |  |  |  |
| Srinath Puducheri Sundaravaradhan |  |  | X |  |
| [V] Inaki Val, MaxLinear | X |  |  |  |
| [V] Qing Xia, Sony | X |  |  |  |
| [V] Kanke Wu, apple | X |  |  |  |
| [V] Yaoshen Cui, TP-Link | X |  |  |  |
| [V] Daniel Verenzuela | X |  |  |  |
| [V] Hiroyuki Motozuka, Panasonic | X |  |  |  |
| [V] Michail Koundourakis, Samsung |  | X |  |  |
| [V] BIAN Tong, Panasonic | X |  |  |  |
| [V] Saju Palayur - Maxlinear | X |  |  |  |
| [V] Yue Zhao Huawei | X |  |  |  |
| [V] Atsushi Shirakawa, Sharp | X |  |  |  |
| [V] Zhongjiang Yan, Northwestern Polytechnical University | X |  |  |  |
| [V] Lan Peng | X |  |  |  |
| [V] Olubukola Adakeja, Teradyne |  |  | X |  |
| [V] Li-Hsiang Sun, Mediatek | X |  |  |  |
| [PV] Manasi Ekkundi, Samsung Electronics | X |  |  |  |
| [V] Zhenguo Du | X |  |  |  |
| [V] Insun Jang | X |  |  |  |
| [V] Pascal Viger, Canon | X |  |  |  |
| [V] Hiromichi Tomeba, sharp | X |  |  |  |
| [V] Guogang Huang Huawei | X |  |  |  |
| [V] HanGyu Cho/LGE | X |  |  |  |
| [V]Abhijit Bhattacharya, Qualcomm | X |  |  |  |
| [V] Ning Gao, OPPO | X |  |  |  |
| [V] Helene Ralle |  |  | X |  |
| [V] Shinya MIWA, Canon | X |  |  |  |
| [V] Hongwon Lee, LG | X |  |  |  |
| [V] SunHee Baek LGE | X |  |  |  |
| [V] Po-Kai Huang Intel | X |  |  |  |
| [V] Yingqiao Quan, Spreadtrum | X |  |  |  |
| [V] Jinsoo Choi LG | X |  |  |  |
| [v] Jay Yang [ZTE] | X |  |  |  |
| [V] Kazuto Yano, ATR | X |  |  |  |
| [V] George Chih-Chun Kuo, Mediatek Inc. | X |  |  |  |
| [V] Dongguk Lim |  |  | X |  |
| Malcolm Smith | X |  |  |  |
| [V] Thomas Handte, Sony | X |  |  |  |
| [v] Xiandong Dong-xiaomi |  |  | X |  |
| [V] GeonHwan Kim, LGE | X |  |  |  |
| [V] Chaoming Luo, OPPO |  |  | X |  |
| [PV] Yuxin Lu | X |  |  |  |
| [V] Hank ChiHan Huang | X |  |  |  |
| [V] Pei Zhou, TCL |  |  | X |  |
| Yusuke Tanaka | X |  |  |  |
| [V] Mengshi Hu | X |  |  |  |
| [V] Shawn(Sanghyun) Kim, WILUS Inc. | X |  |  |  |
| [V] Mingyu Lee, Samsung Electronics | X |  |  |  |
| [PV] Abhishek Chaturvedi, Samsung Electronics | X |  |  |  |
| [V] Rubayet Shafin, Samsung Electronics | X |  |  |  |
| [V] Tom Pare, MediaTek | X |  |  |  |
| [V] Yuki FUJIMORI | X |  |  |  |
| [V] Liwen Chu, NXP | X |  |  |  |
| Yunsi Ma | X |  |  |  |
| [PV] Hui Yang, Huawei | X |  |  |  |
| [V] Kosuke Aio, Sony | X |  |  |  |
| [V] Kiseon Ryu, NXP | X |  |  |  |
| [V]Jun Minotani, Panasonic Holdings Corporation | X |  |  |  |
| [V] Gil Rosenzweig, Renesas Electronics | X |  |  |  |
| Pooria Pakrooh | X |  |  |  |
| [V] Denis Bykov, NXP | X |  |  |  |
| [V] Rolf de Vegt, Qualcomm | X |  |  |  |
| [V] Yunbo Li | X |  |  |  |
| [V] Ryuichi Hirata | X |  |  |  |
| [V] Yoshio Urabe, Panasonic | X |  |  |  |
| [v]Jiangwu, iTenest | X |  |  |  |
| [V] Steven Qi Wang, Huawei | X |  |  |  |
| Sudhir Srinivasa |  |  | X |  |
| [V] Oded Redlich, Huawei | X |  |  |  |
| [V] Qinglai Liu, Panasonic |  |  | X |  |
| [V] Hirohiko Inohiza |  |  | X |  |
| [V] Yongsen Ma, Samsung | X |  |  |  |
| [V] Ahmed Elsherif, Qualcomm | X |  |  |  |
| Juan Carlos Zuniga | X |  |  |  |
| [V] Taeyoung Ha, Samsung | X |  |  |  |
| [V] Laurent Cariou, Intel | X |  |  |  |
| Yongho Seok | X |  |  |  |
| [V] Chulho Chung | X |  |  |  |
| [V] Albert Bredewoud, Broadcom | X |  |  |  |
| [V] Jouni Malinen, Qualcomm | X |  |  |  |
| [V] Xiayu Zheng, NXP | X |  |  |  |
| Jeff J.Q. Liu | X |  |  |  |
| [V] Sameer Vermani | X |  |  |  |
| Ian Sherlock |  |  | X |  |
| [V] Evgeny Khorov, IITP RAS |  |  | X |  |
| Samir Khericha | X |  |  |  |
| [V] Zheng Guo,NXP |  |  | X |  |
| SK Yong | X |  |  |  |
| Reza Hedayat | X |  |  |  |
| [V] Robert Sosack Molex |  |  | X |  |
| [V]Kazuyuki Tota Canon | X |  |  |  |
| [V] Leif Wilhelmsson |  |  | X |  |
| [V] Abhishek Mantha, Broadcom | X |  |  |  |
| [V] Nikola Serafimovski |  |  | X |  |
| Chitto Ghosh | X |  |  |  |
| [V] Karthik Srinivasa Gopalan, Samsung Electronics | X |  |  |  |
| [V] Karim Nassiri Toussi, BRCM | X |  |  |  |
| [v] Luis Gutierrez, Broadcom | X |  |  |  |
| [V] Matthew Fischer (Broadcom) | X |  |  |  |
| [V] Hongyuan Zhang | X |  |  |  |
| Julia Feng | X |  |  | INVALID VOTE |
| [V] Kumail Haider (Meta) | X |  |  |  |
| [V] David Boldy, Broadcom | X |  |  |  |
| [V] Junghoon Suh Huawei | X |  |  |  |
| Nan Cheng，XiDian University | X |  |  | INVALID VOTE |
| [V] Vinko Erceg, Broadcom | X |  |  |  |
| [V] Frank Chien-Fang Hsu, Mediatek | X |  |  |  |
| Yanbin Sun (Evan) | X |  |  |  |
| [V] Lin Yang (Qualcomm) | X |  |  |  |
| Ming Gan | X |  |  |  |
| [V] Bin Qian, Huawei | X |  |  |  |
| [V] Peshal Nayak, Samsung Research America | X |  |  |  |
| [V] VK Jones - Qualcomm | X |  |  |  |
| [V] Shubhodeep Adhikari Broadcom | X |  |  |  |

* The record of the voting result for Motion 28

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name / Affiliation | Yes | No | Abs. | Validation Check |
| [V] Hui Luo, Infineon |  | X |  |  |
| [V] Charlie Pettersson, | X |  |  |  |
| Anuj Batra |  |  | X |  |
| [V] Karim Nassiri Toussi, BRCM | X |  |  |  |
| Tianyu Wu | X |  |  |  |
| Neel Nurani Krishnan | X |  |  |  |
| Leo Montreuil | X |  |  |  |
| [V] Rethna Pulikkoonattu, Broadcom Inc |  | X |  |  |
| [V] Pooya Monajemi, Apple |  |  | X |  |
| Nehru Bhandaru | X |  |  |  |
| [V] Joonsoo, Newracom |  |  | X |  |
| [V] George Cherian | X |  |  |  |
| Aditi Singh |  |  | X |  |
| [V] Anton Karamyshev, IITP RAS | X |  |  |  |
| [V] Tony Zeng | X |  |  |  |
| [V] Yonggang Fang |  | X |  |  |
| [V] Xiangxin Gu, Spreadtrum |  | X |  |  |
| orange3644@gmail.com |  |  | X | INVALID VOTE |
| Xiaofei Wang |  | X |  |  |
| [V] Insik Jung, LGE | X |  |  |  |
| Maulik Vaidya | X |  |  |  |
| [V] Sang Kim LGE | X |  |  |  |
| Chris Young | X |  |  |  |
| [V] Patrice NEZOU |  | X |  |  |
| [V] Hassan Omar, Huawei | X |  |  |  |
| Sindhu Verma | X |  |  |  |
| Sangho Seo | X |  |  |  |
| [V] Kazunobu Serizawa, ATR | X |  |  |  |
| [V] Heejung Yu, Korea Univ. |  |  | X |  |
| [V] Dibakar Das, Intel | X |  |  |  |
| Wook Bong Lee |  |  | X |  |
| [V] Sara Norouzi | X |  |  |  |
| [V] Yan Zhang, Apple | X |  |  |  |
| [V] Shuntaro Suzuki, Yamaha |  | X |  |  |
| [V] Leonardo Lanante, Ofinno | X |  |  |  |
| [V] Thomas Derham | X |  |  |  |
| Mehdi Ganji |  |  | X |  |
| Subir Das |  | X |  |  |
| Yong Liu | X |  |  |  |
| [V] Dong Wei |  |  | X |  |
| [V] Siukai Mak, Broadcom | X |  |  |  |
| [V]Hanqing Lou, InterDigital |  | X |  |  |
| [V] Tuncer Baykas, Ofinno |  | X |  |  |
| Menzo Wentink | X |  |  |  |
| [V] Alice Jialing Li Chen | X |  |  |  |
| Lalit Garg | X |  |  |  |
| Jinjing Jiang | X |  |  |  |
| [V] Jinho Choi, Samsung Electronics |  | X |  |  |
| [V] Prabodh Varshney | X |  |  |  |
| Paul Cheng |  | X |  |  |
| [V] Takuhiro Sato, Sharp |  |  | X |  |
| [V] Yan Xin, Huawei | X |  |  |  |
| [V] Akira Kishida | X |  |  |  |
| [V] Vyacheslav Loginov, IITP RAS | X |  |  |  |
| [V] Aiguo Yan - Samsung |  | X |  |  |
| [V] Abdel Karim Ajami, Apple Inc. | X |  |  |  |
| [V] Duncan Ho |  | X |  |  |
| [V] Mahmoud Kamel |  | X |  |  |
| [V] Rainer Strobel, MaxLinear |  |  | X |  |
| [V] Martin Eiger, Peraton Labs |  |  | X |  |
| [V] Junbin Chen, TP-Link | X |  |  |  |
| Feng Jiang | X |  |  |  |
| Jarkko Kneckt | X |  |  |  |
| [V] Serhat Erkucuk, Ofinno | X |  |  |  |
| Yanjun Sun | X |  |  |  |
| [V] Okan Mutgan, Nokia |  |  | X |  |
| [V] Jonghoe Koo, Samsung Electronics |  | X |  |  |
| [V] Srinivas Kandala Samsung | X |  |  |  |
| Julia Feng |  | X |  | INVALID VOTE |
| [V] Carol Ansley, Cox |  | X |  |  |
| [V] Giovanni Chisci, Qualcomm |  | X |  |  |
| [v] Dana Ciochina Sony |  |  | X |  |
| [V] Ilya Levitsky, IITP RAS | X |  |  |  |
| [V] Der-Zheng Liu, Realtek | X |  |  |  |
| Gary Anwyl |  | X |  |  |
| [V] Naveen Kakani | X |  |  |  |
| [V] Ray Yang, InterDigital |  | X |  |  |
| Pelin Salem |  | X |  |  |
| Sigurd Schelstraete |  | X |  |  |
| [V] Timothy Jeffries - Futurewei | X |  |  |  |
| [V] Yusuke Asai, NTT |  |  | X |  |
| Ali Raissinia | X |  |  |  |
| [V] Ross Jian Yu Huawei | X |  |  |  |
| [V] Eugene Baik, Qualcomm | X |  |  |  |
| [V] Greg White [CableLabs] |  |  | X |  |
| Xuming Wu （Huawei） | X |  |  |  |
| [V] Youhan Kim, Qualcomm Technologies, Inc. | X |  |  |  |
| Jianhan Liu |  | X |  |  |
| [V] Sherief Helwa, Qualcomm Technologies Inc. | X |  |  |  |
| Binita Gupta |  | X |  |  |
| [V] Sanket Kalamkar |  | X |  |  |
| [V] Stephane Baron, |  | X |  |  |
| Shengquan Hu |  | X |  | INVALID VOTE |
| Nan Cheng，XiDian University | X |  |  |  |
| [V] Gaurang Naik, Qualcomm Technologies, Inc. |  | X |  |  |
| [V] Mikael LORGEOUX Canon |  |  | X |  |
| [V] Gaurav Patwardhan, HPE |  | X |  |  |
| James Yee |  | X |  |  |
| [V] Jaheon Gu, Samsung Electronics | X |  |  |  |
| Oren Kedem [Maxlinear] |  | X |  |  |
| [V] Abhishek Patil |  | X |  |  |
| [V] Ying Wang, InterDigital |  | X |  |  |
| [V] Juan Fang, intel |  | X |  |  |
| Brian Hart |  | X |  |  |
| [V] Bin Tian | X |  |  |  |
| [V] William Li (Spreadtrum-US) |  |  | X |  |
| [V] HUI CHE, Ruijie |  | X |  |  |
| Ke Zhong | X |  |  |  |
| [V] Seongho Byeon, Samsung Electronics |  |  | X |  |
| [V] Julien Sevin, Canon | X |  |  |  |
| [A] Li Quan , ZTE | X |  |  | INVALID VOTE |
| [V] Jason Yuchen Guo | X |  |  |  |
| [V] Salvatore Talarico - Sony | X |  |  |  |
| Srinath Puducheri Sundaravaradhan | X |  |  |  |
| Chunyu Hu |  |  | X |  |
| [V] Inaki Val, MaxLinear |  | X |  |  |
| [V] Qing Xia, Sony |  |  | X |  |
| [V] Kanke Wu, apple |  |  | X |  |
| Alvin Hsu (徐永平) |  | X |  | INVALID VOTE |
| [V] Yaoshen Cui, TP-Link |  |  | X |  |
| [V] Daniel Verenzuela | X |  |  |  |
| [V] Hiroyuki Motozuka, Panasonic | X |  |  |  |
| [V] Michail Koundourakis, Samsung |  |  | X |  |
| [V] BIAN Tong, Panasonic | X |  |  |  |
| [V] Saju Palayur - Maxlinear | X |  |  |  |
| [V] Yue Zhao Huawei | X |  |  |  |
| [V] Atsushi Shirakawa, Sharp | X |  |  |  |
| [V] Zhongjiang Yan, Northwestern Polytechnical University | X |  |  |  |
| [V] Lan Peng | X |  |  |  |
| [V] Olubukola Adakeja, Teradyne |  |  | X |  |
| [V] Li-Hsiang Sun, Mediatek |  | X |  |  |
| [PV] Manasi Ekkundi, Samsung Electronics | X |  |  |  |
| [V] Zhenguo Du | X |  |  |  |
| [V] Insun Jang | X |  |  |  |
| [V] Pascal Viger, Canon |  |  | X |  |
| [V] Hiromichi Tomeba, sharp | X |  |  |  |
| [V] Guogang Huang Huawei | X |  |  |  |
| Wei Lin Huawei | X |  |  |  |
| [V] HanGyu Cho/LGE | X |  |  |  |
| [V]Abhijit Bhattacharya, Qualcomm | X |  |  |  |
| [V] Ning Gao, OPPO |  |  | X |  |
| [V] Helene Ralle | X |  |  |  |
| [V] Shinya MIWA, Canon | X |  |  |  |
| [V] Hongwon Lee, LG | X |  |  |  |
| [V] SunHee Baek LGE | X |  |  |  |
| [V] Po-Kai Huang Intel |  | X |  |  |
| [V] Yingqiao Quan, Spreadtrum | X |  |  |  |
| [V] Jinsoo Choi LG | X |  |  |  |
| [v] Jay Yang [ZTE] | X |  |  |  |
| [V] Kazuto Yano, ATR | X |  |  |  |
| [V] George Chih-Chun Kuo, Mediatek Inc. |  | X |  |  |
| [V] Dongguk Lim | X |  |  |  |
| Malcolm Smith |  | X |  |  |
| [V] Thomas Handte, Sony |  | X |  |  |
| [V] GeonHwan Kim, LGE | X |  |  |  |
| [V] Chaoming Luo, OPPO |  |  | X |  |
| [PV] Yuxin Lu |  |  | X |  |
| [V] Hank ChiHan Huang |  | X |  |  |
| [V] Pei Zhou, TCL |  |  | X |  |
| Yusuke Tanaka | X |  |  |  |
| [V] Mengshi Hu | X |  |  |  |
| [V] Shawn(Sanghyun) Kim, WILUS Inc. |  |  | X |  |
| [V] Mingyu Lee, Samsung Electronics | X |  |  |  |
| [PV] Abhishek Chaturvedi, Samsung Electronics | X |  |  |  |
| [V] Rubayet Shafin, Samsung Electronics | X |  |  |  |
| [V] Tom Pare, MediaTek | X |  |  |  |
| [V] Yuki FUJIMORI | X |  |  |  |
| Yunsi Ma | X |  |  |  |
| [PV] Hui Yang, Huawei | X |  |  |  |
| [V] Kosuke Aio, Sony | X |  |  |  |
| [V] Niranjan Grandhe, NXP | X |  |  |  |
| [V]Jun Minotani, Panasonic Holdings Corporation | X |  |  |  |
| Pooria Pakrooh | X |  |  |  |
| [V] Denis Bykov, NXP | X |  |  |  |
| [V] Rolf de Vegt, Qualcomm | X |  |  |  |
| [V] Lin Yang | X |  |  |  |
| [V] Yunbo Li | X |  |  |  |
| [V] Ryuichi Hirata | X |  |  |  |
| [V] Yoshio Urabe, Panasonic | X |  |  |  |
| [v]Jiangwu, iTenest |  |  | X |  |
| [V] Steven Qi Wang, Huawei | X |  |  |  |
| [V] Maolin Zhang, Huawei | X |  |  |  |
| Sudhir Srinivasa | X |  |  |  |
| [V] Bo Li Northwestern Polytechnical University | X |  |  |  |
| [V] Oded Redlich, Huawei | X |  |  |  |
| Dekun Liu | X |  |  |  |
| [V] Qinglai Liu, Panasonic |  |  | X |  |
| [PV] Shuang Fan, Sanechips | X |  |  |  |
| [V] Hirohiko Inohiza |  |  | X |  |
| [V] Yongsen Ma, Samsung |  | X |  |  |
| [V] Ahmed Elsherif, Qualcomm | X |  |  |  |
| Juan Carlos Zuniga |  | X |  |  |
| [V] Taeyoung Ha, Samsung |  | X |  |  |
| Mohamed Abouelseoud |  |  | X |  |
| [V] Laurent Cariou, Intel |  | X |  |  |
| [V] Dmitry Akhmetov, Intel | X |  |  |  |
| Yongho Seok |  | X |  |  |
| Santra Avik | X |  |  |  |
| [V] Chulho Chung | X |  |  |  |
| [V] Albert Bredewoud, Broadcom | X |  |  |  |
| [V] Hang Su Broadcom |  |  | X |  |
| [V] Jouni Malinen, Qualcomm | X |  |  |  |
| [V] VK Jones - Qualcomm |  | X |  |  |
| [V] Xiayu Zheng, NXP | X |  |  |  |
| Jeff J.Q. Liu | X |  |  |  |
| [V] Sameer Vermani | X |  |  |  |
| Ian Sherlock |  | X |  |  |
| [V] Evgeny Khorov, IITP RAS | X |  |  |  |
| Samir Khericha | X |  |  |  |
| [V] Zheng Guo,NXP | X |  |  |  |
| [V] Davide Magrin, Meta |  |  | X |  |
| Reza Hedayat | X |  |  |  |
| [PV] Ahmed Mohamed, NXP | X |  |  |  |
| [V] Karthik Srinivasa Gopalan, Samsung Electronics |  |  | X |  |
| Chung-Ta Ku, Mediatek |  | X |  |  |
| [V] Sebastian Max | X |  |  |  |
| [V] Ashish Shukla, Amazon |  |  | X |  |
| [V] Ming Gan Huawei | X |  |  |  |
| [V] Kumail Haider |  |  | X |  |
| [V] Meriam Rezk, Qualcomm Technologies | X |  |  |  |
| [v] Yuki Tsujimaru | X |  |  |  |
| Yanbin Sun | X |  |  |  |
| You-Wei Chen |  | X |  |  |
| [V]Ravi Gidvani, Samsung | X |  |  |  |
| [V] francis keshmiri, Huawei | X |  |  |  |
| [V] Osama Aboul-Magd (Huawei) | X |  |  |  |
| [V] Bin Qian, Huawei | X |  |  |  |
| [V] Matthew Fischer (Broadcom) | X |  |  |  |
| [V] Junghoon Suh Huawei | X |  |  |  |
| [v] Luis Gutierrez, Broadcom | X |  |  |  |
| [V] Mahmoud Hasabelnaby, Huawei | X |  |  |  |
| Li Ma |  | X |  |  |
| [V] Vinko Erceg, Broadcom | X |  |  |  |
| [V] Shubhodeep Adhikari Broadcom | X |  |  |  |
| [V] Dinakar Prabhakaran (Broadcom) | X |  |  |  |
| [V] Massinissa Lalam, Sagemcom |  | X |  |  |
| [V] Mao Yang Northwestern Polytechnical University | X |  |  |  |
| [V] Hongyuan Zhang | X |  |  |  |
| [V] David Boldy, Broadcom | X |  |  |  |
| [V] Alireza Ghaderipoor, MediaTek |  | X |  |  |
| [V] Frank Chien-Fang Hsu, Mediatek |  | X |  |  |
| [V] Maolin Zhang, Huawei | X |  |  |  |

* The record of the voting result for Motion 29

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name / Affiliation | Yes | No | Abs. | Validation Check |
| [V] Hui Luo, Infineon |  |  | X |  |
| [V] Charlie Pettersson, | X |  |  |  |
| Anuj Batra | X |  |  |  |
| [V] Karim Nassiri Toussi, BRCM | X |  |  |  |
| Tianyu Wu | X |  |  |  |
| Ahmed Helmy | X |  |  |  |
| Neel Nurani Krishnan | X |  |  |  |
| [V] Guido R. Hiertz, Ericsson GmbH | X |  |  |  |
| Leo Montreuil | X |  |  |  |
| [V] Rethna Pulikkoonattu, Broadcom Inc | X |  |  |  |
| [V] Eunsung Jeon, Samsung |  | X |  |  |
| [V] Pooya Monajemi, Apple | X |  |  |  |
| Qi Wang | X |  |  |  |
| Nehru Bhandaru | X |  |  |  |
| [V] Joonsoo, Newracom |  |  | X |  |
| [V] George Cherian | X |  |  |  |
| Aditi Singh | X |  |  |  |
| [V] Anton Karamyshev, IITP RAS | X |  |  |  |
| [V] Xiangxin Gu, Spreadtrum | X |  |  |  |
| orange3644@gmail.com |  |  | X | INVALID VOTE |
| Xiaofei Wang | X |  |  |  |
| [V] Insik Jung, LGE | X |  |  |  |
| Maulik Vaidya | X |  |  |  |
| [V] Sang Kim LGE | X |  |  |  |
| Chris Young | X |  |  |  |
| [V] Patrice NEZOU | X |  |  |  |
| Sindhu Verma | X |  |  |  |
| Sangho Seo | X |  |  |  |
| [V] Kazunobu Serizawa, ATR | X |  |  |  |
| [V] Heejung Yu, Korea Univ. |  |  | X |  |
| [V] Dibakar Das, Intel | X |  |  |  |
| [A] Ian Bajaj, Huawei | X |  |  |  |
| [V] Sara Norouzi | X |  |  |  |
| Taori Rakesh |  |  | X |  |
| [V] Yan Zhang, Apple | X |  |  |  |
| [V] Shuntaro Suzuki, Yamaha |  |  | X |  |
| [V] Leonardo Lanante, Ofinno | X |  |  |  |
| [V] Thomas Derham | X |  |  |  |
| Mehdi Ganji | X |  |  |  |
| Subir Das |  | X |  |  |
| [V] Carl Kain (Noblis; USDOT) | X |  |  |  |
| Yong Liu | X |  |  |  |
| [V] Dong Wei | X |  |  |  |
| [V] Siukai Mak, Broadcom | X |  |  |  |
| [V]Hanqing Lou, InterDigital | X |  |  |  |
| [V] Tuncer Baykas, Ofinno | X |  |  |  |
| Menzo Wentink | X |  |  |  |
| [V] Alice Jialing Li Chen | X |  |  |  |
| Lalit Garg | X |  |  |  |
| Jinjing Jiang | X |  |  |  |
| [V] Prabodh Varshney | X |  |  |  |
| Paul Cheng | X |  |  |  |
| [V] Takuhiro Sato, Sharp | X |  |  |  |
| [V] Yan Xin, Huawei | X |  |  |  |
| [V] Akira Kishida |  |  | X |  |
| [V] Vyacheslav Loginov, IITP RAS | X |  |  |  |
| [V] Aiguo Yan - Samsung |  | X |  |  |
| [V] Duncan Ho | X |  |  |  |
| [V] Mahmoud Kamel | X |  |  |  |
| [V] Rainer Strobel, MaxLinear | X |  |  |  |
| [V] Yelin Yoon, LGE | X |  |  |  |
| [V] Martin Eiger, Peraton Labs |  |  | X |  |
| Feng Jiang | X |  |  |  |
| Jarkko Kneckt | X |  |  |  |
| [V] Serhat Erkucuk, Ofinno | X |  |  |  |
| Yanjun Sun | X |  |  |  |
| [V] Jeongki Kim, Ofinno | X |  |  |  |
| [V] Henry Tzu-Hsuan Chou | X |  |  |  |
| [V] Okan Mutgan, Nokia | X |  |  |  |
| [V] Jonghoe Koo, Samsung Electronics |  | X |  |  |
| [V] Srinivas Kandala Samsung |  | X |  |  |
| Julia Feng | X |  |  | INVALID VOTE |
| [V] Giovanni Chisci, Qualcomm | X |  |  |  |
| [v] Dana Ciochina Sony | X |  |  |  |
| [V] Ilya Levitsky, IITP RAS | X |  |  |  |
| [V] Der-Zheng Liu, Realtek | X |  |  |  |
| Gary Anwyl | X |  |  |  |
| [V] Junyoung Nam, Qualcomm | X |  |  |  |
| [V] Naveen Kakani | X |  |  |  |
| Li Ma | X |  |  |  |
| [V] Ray Yang, InterDigital | X |  |  |  |
| Sigurd Schelstraete | X |  |  |  |
| [V] Timothy Jeffries - Futurewei | X |  |  |  |
| [V] Yusuke Asai, NTT |  |  | X |  |
| [V] Ross Jian Yu Huawei | X |  |  |  |
| [V] Eugene Baik, Qualcomm | X |  |  |  |
| [V] Greg White [CableLabs] |  |  | X |  |
| Morteza Mehrnoush | X |  |  |  |
| Xuming Wu （Huawei） | X |  |  |  |
| [V] Youhan Kim, Qualcomm Technologies, Inc. | X |  |  |  |
| Jianhan Liu | X |  |  |  |
| [V] Sherief Helwa, Qualcomm Technologies Inc. | X |  |  |  |
| Binita Gupta |  | X |  |  |
| [V] Sanket Kalamkar | X |  |  |  |
| [V] Stephane Baron, |  | X |  |  |
| Shengquan Hu | X |  |  | INVALID VOTE |
| [V] Gaurang Naik, Qualcomm Technologies, Inc. | X |  |  |  |
| [V] Mikael LORGEOUX Canon |  |  | X |  |
| [V] Gaurav Patwardhan, HPE | X |  |  |  |
| James Yee | X |  |  |  |
| [V] Jaheon Gu, Samsung Electronics | X |  |  |  |
| [V] Mahmoud Hasabelnaby, Huawei | X |  |  |  |
| Oren Kedem [Maxlinear] | X |  |  |  |
| [V] Abhishek Patil | X |  |  |  |
| [V] Ying Wang, InterDigital | X |  |  |  |
| [V] Juan Fang, intel | X |  |  |  |
| Brian Hart |  | X |  |  |
| [V] Bin Tian | X |  |  |  |
| [V] William Li (Spreadtrum-US) | X |  |  |  |
| [V] HUI CHE, Ruijie | X |  |  |  |
| Ke Zhong | X |  |  |  |
| [V] Seongho Byeon, Samsung Electronics |  |  | X |  |
| [V] Julien Sevin, Canon | X |  |  |  |
| [A] Li Quan , ZTE | X |  |  | INVALID VOTE |
| [V] Jason Yuchen Guo | X |  |  |  |
| [V] Salvatore Talarico - Sony | X |  |  |  |
| Srinath Puducheri Sundaravaradhan | X |  |  |  |
| Chunyu Hu |  | X |  |  |
| [V] Qing Xia, Sony |  |  | X |  |
| [V] Kanke Wu, apple | X |  |  |  |
| Alvin Hsu (徐永平) | X |  |  | INVALID VOTE |
| [V] Yaoshen Cui, TP-Link | X |  |  |  |
| [V] Daniel Verenzuela | X |  |  |  |
| [V] Hiroyuki Motozuka, Panasonic | X |  |  |  |
| [V] Michail Koundourakis, Samsung | X |  |  |  |
| [V] BIAN Tong, Panasonic | X |  |  |  |
| [V] Saju Palayur - Maxlinear | X |  |  |  |
| [V] Yue Zhao Huawei | X |  |  |  |
| [V] Atsushi Shirakawa, Sharp | X |  |  |  |
| [V] Zhongjiang Yan, Northwestern Polytechnical University | X |  |  |  |
| [V] Lan Peng | X |  |  |  |
| [V] Olubukola Adakeja, Teradyne |  |  | X |  |
| [V] Li-Hsiang Sun, Mediatek | X |  |  |  |
| [PV] Manasi Ekkundi, Samsung Electronics | X |  |  |  |
| [V] Zhenguo Du | X |  |  |  |
| [V] Insun Jang | X |  |  |  |
| [V] Pascal Viger, Canon | X |  |  |  |
| [V] Hiromichi Tomeba, sharp | X |  |  |  |
| [V] HanGyu Cho/LGE | X |  |  |  |
| [V]Abhijit Bhattacharya, Qualcomm | X |  |  |  |
| [V] Ning Gao, OPPO |  | X |  |  |
| [V] Helene Ralle |  |  | X |  |
| [V] Shinya MIWA, Canon | X |  |  |  |
| [V] Hongwon Lee, LG | X |  |  |  |
| [V] SunHee Baek LGE | X |  |  |  |
| [V] Yingqiao Quan, Spreadtrum | X |  |  |  |
| [V] Jinsoo Choi LG | X |  |  |  |
| [v] Jay Yang [ZTE] | X |  |  |  |
| [V] Kazuto Yano, ATR | X |  |  |  |
| [V] George Chih-Chun Kuo, Mediatek Inc. | X |  |  |  |
| [V] Dongguk Lim | X |  |  |  |
| [V] Thomas Handte, Sony |  | X |  |  |
| [V] GeonHwan Kim, LGE | X |  |  |  |
| [V] Chaoming Luo, OPPO | X |  |  |  |
| [V] Hank ChiHan Huang | X |  |  |  |
| [V] Pei Zhou, TCL | X |  |  |  |
| Yusuke Tanaka | X |  |  |  |
| [V] Mengshi Hu | X |  |  |  |
| [V] Shawn(Sanghyun) Kim, WILUS Inc. |  |  | X |  |
| [V] Mingyu Lee, Samsung Electronics | X |  |  |  |
| [PV] Abhishek Chaturvedi, Samsung Electronics | X |  |  |  |
| [V] Rubayet Shafin, Samsung Electronics |  | X |  |  |
| [V] Colin Kim, Broadcom | X |  |  |  |
| [V] Tom Pare, MediaTek | X |  |  |  |
| [V] Yuki FUJIMORI | X |  |  |  |
| Yunsi Ma | X |  |  |  |
| [PV] Hui Yang, Huawei | X |  |  |  |
| [V] Kosuke Aio, Sony | X |  |  |  |
| [V] Kiseon Ryu, NXP | X |  |  |  |
| [V] Niranjan Grandhe, NXP | X |  |  |  |
| [V]Jun Minotani, Panasonic Holdings Corporation | X |  |  |  |
| Pooria Pakrooh | X |  |  |  |
| [V] Denis Bykov, NXP | X |  |  |  |
| [V] Rolf de Vegt, Qualcomm | X |  |  |  |
| [V] Lin Yang | X |  |  |  |
| [V] Yunbo Li | X |  |  |  |
| [V] Ryuichi Hirata | X |  |  |  |
| [V] Yoshio Urabe, Panasonic | X |  |  |  |
| [V] Steven Qi Wang, Huawei | X |  |  |  |
| [V] Maolin Zhang, Huawei | X |  |  |  |
| [V] Bo Li Northwestern Polytechnical University | X |  |  |  |
| [V] Oded Redlich, Huawei | X |  |  |  |
| Dekun Liu | X |  |  |  |
| [V] Qinglai Liu, Panasonic | X |  |  |  |
| [PV] Shuang Fan, Sanechips | X |  |  |  |
| [V] Hirohiko Inohiza | X |  |  |  |
| [V] Yongsen Ma, Samsung |  | X |  |  |
| [V] Ahmed Elsherif, Qualcomm | X |  |  |  |
| Juan Carlos Zuniga |  | X |  |  |
| [V] Taeyoung Ha, Samsung | X |  |  |  |
| Mohamed Abouelseoud | X |  |  |  |
| [V] Laurent Cariou, Intel | X |  |  |  |
| [V] Chulho Chung | X |  |  |  |
| [V] Albert Bredewoud, Broadcom | X |  |  |  |
| [V] Hang Su Broadcom | X |  |  |  |
| [V] Jouni Malinen, Qualcomm | X |  |  |  |
| [V] Xiayu Zheng, NXP | X |  |  |  |
| Jeff J.Q. Liu | X |  |  |  |
| [V] Sameer Vermani | X |  |  |  |
| Ian Sherlock | X |  |  |  |
| [V] Evgeny Khorov, IITP RAS | X |  |  |  |
| Samir Khericha | X |  |  |  |
| [V] Zheng Guo,NXP | X |  |  |  |
| [V] Davide Magrin, Meta |  |  | X |  |
| Reza Hedayat |  |  | X |  |
| [PV] Ahmed Mohamed, NXP |  |  | X |  |
| [V] Robert Sosack Molex |  |  | X |  |
| [V] Karthik Srinivasa Gopalan, Samsung Electronics | X |  |  |  |
| [V] Osama Aboul-Magd | X |  |  |  |
| Chung-Ta Ku, Mediatek | X |  |  |  |
| [V] Frank Chien-Fang Hsu, Mediatek | X |  |  |  |
| [V] Sebastian Max | X |  |  |  |
| [V] Aleksey Kureev, IITP RAS | X |  |  |  |
| [V] Ashish Shukla, Amazon |  | X |  |  |
| [V] Kumail Haider |  | X |  |  |
| [V] BO SUN, Sanechips |  |  | X |  |
| [V] Meriam Rezk, Qualcomm Technologies | X |  |  |  |
| [v] Yuki Tsujimaru | X |  |  |  |
| [V]Ravi Gidvani, Samsung |  | X |  |  |
| [V]Kazuyuki Tota Canon |  |  | X |  |
| Yanbin Sun | X |  |  |  |
| [V] William Carney, Sony | X |  |  |  |
| [V] Bo Gong | X |  |  |  |
| [V] francis keshmiri, Huawei | X |  |  |  |
| [V] Dror Regev (Huawei) | X |  |  |  |
| [V] Vinko Erceg, Broadcom | X |  |  |  |
| [V] Matthew Fischer (Broadcom) | X |  |  |  |
| [V] Junghoon Suh Huawei | X |  |  |  |
| [V] Mao Yang Northwestern Polytechnical University | X |  |  |  |
| [V] Massinissa Lalam, Sagemcom |  |  | X |  |
| [V] Hongyuan Zhang | X |  |  |  |
| [V] Dinakar Prabhakaran (Broadcom) | X |  |  |  |
| [V] Bin Qian, Huawei | X |  |  |  |
| [v] Luis Gutierrez, Broadcom | X |  |  |  |
| [V] Dmitry Bankov, IITP RAS | X |  |  |  |
| [V] Alireza Ghaderipoor, MediaTek | X |  |  |  |
| [V] David Boldy, Broadcom | X |  |  |  |
| [V] Abdel Karim Ajami, Apple Inc. | X |  |  |  |