IEEE P802.11
Wireless LANs

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| TGbn January February March 2024 Teleconference Minutes |
| Date: 2024-02-26 |
| Author(s): |
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|  |  |  |  |  |

Abstract

This document contains the minutes for TGbn January, February and March 2023 teleconferences.

Revision history:

* Rev0: First version of the document.

Abbreviations:

* C: Comment.
* A: Answer.

# 1st Conf. Call: January 29th, Monday (19:00-21:00 ET)-PHY/MAC

* Split PHY and MAC ad-hoc teleconferences.
	+ PHY: <https://mentor.ieee.org/802.11/dcn/24/11-24-0223-00-00bn-minutes-tgbn-phy-ad-hoc-jan-to-march-cc.docx>
	+ MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-0218-02-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-in-january-to-march-2024.docx>

# 2nd Conf. Call: February 1st, Thursday (10:00-12:00 ET)-Joint

* Call the meeting to order
* IEEE 802 and 802.11 IPR policy and procedure
	+ Patent Policy: Ways to inform IEEE:
		- Cause an LOA to be submitted to the IEEE-SA (patcom@ieee.org); 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 speaks/writes 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([11-24-201r2](https://mentor.ieee.org/802.11/dcn/24/11-24-0201-02-00bn-jan-mar-tgbn-teleconference-agenda.docx)).
* Attendance reminder.
	+ Participation slide: <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180-05-00EC-ieee-802-participation-slide.pptx>
	+ Please record your attendance during the conference call by using the IMAT system:
		- 1) login to [imat](https://imat.ieee.org/attendance), 2) select “802 Wireless Interim/Plenary Session” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “TGbn conference call that you are attending.
		- If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to:
		Yusuke Asai (yusuke.asai@ntt.com) & Alfred Asterjadhi (aasterja@qti.qualcomm.com)
	+ Please ensure that the following information is listed correctly when joining the call:
	+ "[voter status] First Name Last Name (Affiliation)"
* Agenca
	+ Chair reviews proposed agenda found in [11-24-201r2](https://mentor.ieee.org/802.11/dcn/24/11-24-0201-02-00bn-jan-mar-tgbn-teleconference-agenda.docx).
	+ Discussion: None.
	+ Agenda approved with unanimous consent.
* Technical Submissions – MAP/Coordination:
	+ [11-23/1952r3](https://mentor.ieee.org/802.11/dcn/23/11-23-1952-03-00bn-coordinated-r-twt-for-multi-ap-scenarios-follow-up.pptx): Coordinated R-TWT for Multi-AP scenarios - Follow up

Liuming Lu (OPPO)

(The presentation of the submission had been done the Jaunary 2024 F2F meeting. The presenter explained the update of the submission since the last meeting.)

C: In the slide 5, in the R-TWT setup for Type 1, you newly introduced some R-TWT request and response between APs. But the R-TWT currently uses the broadcast TWT and it could have multiple members. Do you expect for each STA negotiate with the AP and is this kind of R-TWT request response between APs needed?

A: Whether the APs set up the coordinator R-TWT or not depends on the distribution of the stations. If the stations may be impacted by the OBSS interference I think the coordinated R-TWT is needed.

C: Your proposal is slightly different from a lot of other contributions which propose like the second AP relays or broadcasts another AP’s R-TWT element.

C: In the slide 8, this overall summary says the Type 1 does not require a CSI, but some exchange of the information of transmission power between the APs should be needed, is it right?

A: Yes. The information of transmit power may be need especially for the PD based spatial reuse or the C-SR based spatial reuse which can be used based on the exchange of the transmit power. I think the coordinated spatial reuse triggerd by the multi-AP is different from the PD or C-SR based spatial reuse.

C: In the slide 4, when there are multiple R-TWT member stations in BSS1, the existing R-TWT cannot decide which station transmits in the R-TWT SP. In that case, how should the AP decide to optimize Tx power control? I think the AP2 cannot know which station can transmit first in R-TWT.

A: I think it depends on the decisions and scenarios. The AP1 and the AP2 can make decisions how to form membership between staions. In this proposal, I show an example that the AP2 does the information exchange to limit the transmit power with its own stations.

C: I think it's much better if the client sends its cost characteristics requirements, and then the AP has more understanding of the underlying degrees of freedom that the AP has to schedule, and then interact with other APs in order to find the sort of globally most useful schedule. I guess that that's just one thought. Leading with the R-TWT by the client, that doesn't really work for some clients. That doesn't really work for the beacon. It just doesn't leave the AP with the as much information as it could have. That initiating step is maybe not the best from my perspective.

A: I think it would be that the AP1 and AP2 can also send the answer solicited and the setup to set up the coordinated R-TWT. I think your comments are reasonable.

C: Regarding scalability aspects, in Type 2, when the AP1 and the AP2 operating the same chanel but their primary channels are different with each other, what happens? When you have more OBSSs, how will it scale?

A: Your concern is reasonable. In my contribution, two BSSs are considered. If we have more OBSSs, the APs can also negotiate with each other and depend on their decision and decide how to set up a where to set up and coordinated R-TWT.

C: Maybe it becomes a combination of the Type 1 and the Type 2 in more OBSSs cases. Because in some cases, the primary channels become the same, then it falls back to this half-coordinated scheme that you were talking about.

A: If we utilize the MLD in 11be, the number of OBSSs may be reduced.

* + [11-23/1920r2](https://mentor.ieee.org/802.11/dcn/23/11-23-1920-02-00bn-managed-networks-under-highly-congested-scenarios.pptx): Managed Networks under highly congested scenarios

Iñaki Val (MaxLinear)

C: Many thanks for bringing this topic forward. In the slide 10, when we talk about the capability of quantifying the traffic load metrics, each BSS ensures to support these reports. It is good and important, but it doesn't really give us the time dimension very clearly. I assume you're thinking of sort of that, it may be a general sense, like maybe sharing R-TWT agreements, or cost characteristics, requests or agreements, as well as sort of traffic load metrics.

A: I was thinking mainly on existing traffic methods that are already standardized in current 802.11 standard in terms of throughput. I think there could be these KPIs or metrics that will be needed in order to have a better coordination.

C: I think at least sharing information among themselves for helping coordination could be a vital part of the solution.

C: I suppose this concept of some managed network, because some AP centric controls may fulfill strict latency requirements such as industry automation. But in non-managed networks, such as stations or some public spaces where many relatively devices exist, it is quite challenging to centralize management, So, we should expand countermeasure above that.

A: Do you consider the coextence with legacy devices?

C: Yes.

A: We're proposing the centric idea. This proposal is also to do the coexistence with the legacy devices not only propose new ideas that will work with a next generation of Wi-Fi. So, we're also proposing to give more priority access to the AP taking into account the EDCA or DCF parameters than those used by current stations.

C: I agree with your direction.

C: In the slide 7, trigger frames could be a good means, but I think that your access is only able to deal at AC level not at TID or SSID. So, the triggered access cannot use all the tools here are not in line with each other. So, the trigger access cannot use an SSID, what is your thinking on this?

A: I just listed some of the tools that have more control over the the traffic access. We proabably identify some gaps of these current mechanisms.

C: OK. When there is a congestion, the AP has to figure out just what it is expected to trigger as a priority traffic. If the APs manage at an AC level, it cannot do a fine-grained scheduling. So, I think we have to annouce this event for MSCS or TID.

A: Thank you.

C: In your straw poll text, you want to manage the P2P, which includes online and offline P2P operations. I guess you want to include offline P2P. And you want to propose to steer other APs in sub-channel level. How do you control the other APs in the managed networks?

A: We can extend our proposal for the multi-AP environment.

C: In the slide 10, how can we do that the AP is silencing other users? Is it the realistic situation? You may have a lot of legacy users in the network that doesn't even have trigger-based channel access.

A: If we are talking about legacy devices, they don't have any mechanisms to silence in EDCA.We are also proposing to have reminded the channel accesse, times or backoffs, that are assigned to the AP will have more advantages, with respect to legacy devices. If we take the HCCA mechanisms, the APs takes advantages to wait less time for channel access than any other devices or any other AP devices. To set better parameters in terms of channel access advantages for the AP is the only way to deal with the legacy devices.

C: OK. For the AP scheduling peer to peer, there is no way as well to control other peer to peer tackling the channel and using it without the AP coordination, correct?

A: In this case, the stations also want to establish a peer-to-peer link and ask for resources. For example, during SCS request, the AP is aware of these resources and keeps the medium time for executing that link.

* + [11-23/1972r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1972-01-00bn-evaluation-of-coordinated-spatial-reuse-follow-up.pptx): Evaluation of Coordinated Spatial Reuse – Follow Up

Kosuke Aio (Sony)

C: How do you select MCS and NSS for each transmission? Is it “Genie” or based on certain computation?

A: In this simulation, MCS is fixed for each drop and optimization of MCS is calculated from CNR or SI. So, it is “Genie.”

C: When we use the transmit power control, we vary the signal level as well as interference level, and it depends on the channel utilization as well. I think it is a little bit optimistic performance. My opinion is that it is better to evaluate it some certain level of assumptions further.

A: Thank you.

C: If we use full-power or similar to the CCA-ED, it looks like to gather up most of the gain. So, I think if we use a full power transmission and selectively use CSR for the good users, that is better than the CSR based on thransmit power control. Have you ever thought that kind of approach?

A: I agree with that. In this simulation slide, CCA-ED performs better capacity gain compared to TDMA. But, for example, when CSI is inaccurate, the throughput for CCA-ED will possibly degrade compared to TDMA case.

C: In the case of MCS Max with optimized MCSs, what is the difference between this scheme with the CSI-4APopt? I think you are alredy optimized the tarege MCSs.

A: There is the default point that is only constrained about sharing AP. CSR for AP means aiming to maximize capacity, but the AP will probably assume at one transmit data. We set the one constraint that sharing the AP must aim target MCS, and then optimize the target MCS optimization includes the condition no worse throughput than TDMA. So, CSMA/CA can achieve throughput to gain without worse in fairness.

C: OK. In the slide 9, for the CCA-ED, in this small cell case, why is the performance reduced in large SNR?

A: In this case, in CCA-ED, all the APs can transmit with maxim power and the AP can adjust MCS from the CSI estimated and returned from each STA. In this case, almost all Tx parameters are the same as those in the CSRMCSmax case.

C: But in the range of the midpoint SNR is greater than 40 dB.

A: After this point, neighboring APs can detect the packet above ED level. So, when the sharing AP starts data transmission, neighboring APs cannot transmit data.

C: In the slide 4, you assume two types of CSI, accurate CSI and inaccurate CSI. I’m wondering the meaning of “accurate” and “inaccurate”. Do you mean “accurate” is perfect CSI?

A: In the accurate CSI case, we can calculate TX power SNR or the calculated result based on the pathloss level from the distance. In the inaccurate CSI case, I added some random value to calculate from minus three to plus three dB, and thus the AP cannot know the right path loss level.

C: OK. As the previous commentor said, I also think the perfect MCS selection is somewhat optimistic.

A: I think inaccurate CSI may correspond to the imperfect MCS selection case because the AP cannot know the right SNR value.

C: In the slide 12, what is the difference between the “all links” and the “my link” in CSR-MCSmax? Do the “all links” include the RSSI between the sharing AP and its own BSS as well as those between the sharing AP and the OBSS STAs? And does my link means just the RSSI between the AP and its own BSS?

A: Yes. The appendix (the slide 15) illustrates the “all links” and the “my link.”

* + [11-23/2084r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1895-02-00bn-c-tdma-frame-sequence.pptx): Discussion on Enhanced R-TWT for UHR Jeongki Kim (Offino, LLC.)

(There was no question.)

* Adourned at 20:58.

# February 5th, Monday (19:00-21:00 ET)

* Split PHY and MAC ad-hoc teleconferences.
	+ (PHY: cancelled)
	+ MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-0218-02-00bn-minutes-for-tgbn-mac-ad-hoc-teleconferences-in-january-to-march-2024.docx>

# February 22nd, Thursday (10:00-12:00 ET)

* Split PHY and MAC ad-hoc teleconferences.
	+ (PHY: cancelled)
	+ MAC: <https://mentor.ieee.org/802.11/dcn/24/11-24-0320-00-00bn-11bn-mac-ad-hoc-teleconference-minutes-feb-22-march-2024.doc>

**Appendix**

* Attendee List for the 2nd Conf. Call:

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| TGbn (Joint) | 2/1 | Abouelseoud, Mohamed | Apple Inc. |
| TGbn (Joint) | 2/1 | Aboulmagd, Osama | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Aio, Kosuke | Sony Corporation |
| TGbn (Joint) | 2/1 | Ajami, Abdel Karim | Apple Inc. |
| TGbn (Joint) | 2/1 | Anwyl, Gary | MediaTek Inc. |
| TGbn (Joint) | 2/1 | Asai, Yusuke | Nippon Telegraph and Telephone Corporation (NTT) |
| TGbn (Joint) | 2/1 | Baek, SunHee | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Bian, Tong | Panasonic |
| TGbn (Joint) | 2/1 | Bredewoud, Albert | Broadcom Corporation |
| TGbn (Joint) | 2/1 | Byeon, Seongho | Samsung Electronics Co., Ltd. |
| TGbn (Joint) | 2/1 | Carney, William | Sony Corporation |
| TGbn (Joint) | 2/1 | Cha, Dongju | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Chen, You-Wei | MediaTek Inc. |
| TGbn (Joint) | 2/1 | CHENG, yajun | Xiaomi Communications Co., Ltd. |
| TGbn (Joint) | 2/1 | Chisci, Giovanni | Qualcomm Technologies Inc |
| TGbn (Joint) | 2/1 | Chng, Baw | BAWMAN LLC |
| TGbn (Joint) | 2/1 | Cho, Hangyu | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Choi, JinHo | SAMSUNG ELECTRONICS |
| TGbn (Joint) | 2/1 | Choi, Jinsoo | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Chu, Liwen | NXP Semiconductors |
| TGbn (Joint) | 2/1 | Chung, Chulho | SAMSUNG |
| TGbn (Joint) | 2/1 | Coffey, John | Realtek Semiconductor Corp. |
| TGbn (Joint) | 2/1 | Cui, Yaoshen | TP-Link Corporation Limited |
| TGbn (Joint) | 2/1 | Di Taranto, Rocco | Ericsson AB |
| TGbn (Joint) | 2/1 | Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| TGbn (Joint) | 2/1 | Erkucuk, Serhat | Ofinno |
| TGbn (Joint) | 2/1 | Fan, Shuang | Sanechips Technology Co., Ltd. |
| TGbn (Joint) | 2/1 | Fang, Yonggang | MediaTek Inc. |
| TGbn (Joint) | 2/1 | Fischer, Matthew | Broadcom Corporation |
| TGbn (Joint) | 2/1 | Fujimori, Yuki | Canon Research Centre France |
| TGbn (Joint) | 2/1 | Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| TGbn (Joint) | 2/1 | Ghosh, Chittabrata | Apple Inc. |
| TGbn (Joint) | 2/1 | Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. |
| TGbn (Joint) | 2/1 | GUIGNARD, Romain | Canon Research Centre France |
| TGbn (Joint) | 2/1 | Gupta, Binita | Cisco Systems, Inc. |
| TGbn (Joint) | 2/1 | Ha, Taeyoung | Samsung Electronics Co., Ltd. |
| TGbn (Joint) | 2/1 | Handte, Thomas | Sony Corporation |
| TGbn (Joint) | 2/1 | Hart, Brian | Cisco Systems, Inc. |
| TGbn (Joint) | 2/1 | Hedayat, Ahmadreza | Apple Inc. |
| TGbn (Joint) | 2/1 | Ho, Duncan | Qualcomm Incorporated; Qualcomm Technologies, Inc |
| TGbn (Joint) | 2/1 | Hu, Chunyu | Spreadtrum Communications USA |
| TGbn (Joint) | 2/1 | Huang, Po-Kai | Intel |
| TGbn (Joint) | 2/1 | Jang, Insun | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Kabbinale, Aniruddh | SAMSUNG |
| TGbn (Joint) | 2/1 | Kalamkar, Sanket | Qualcomm Technologies, Inc |
| TGbn (Joint) | 2/1 | Kamel, Mahmoud | InterDigital, Inc. |
| TGbn (Joint) | 2/1 | Kandala, Srinivas | SAMSUNG |
| TGbn (Joint) | 2/1 | Kim, Geon Hwan | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Kim, Jeongki | Ofinno |
| TGbn (Joint) | 2/1 | Kim, Sanghyun | WILUS Inc. |
| TGbn (Joint) | 2/1 | Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| TGbn (Joint) | 2/1 | Klein, Arik | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Koo, Jonghoe | Samsung Electronics Co., Ltd. |
| TGbn (Joint) | 2/1 | Koundourakis, Michail | Samsung Cambridge Solution Center |
| TGbn (Joint) | 2/1 | Kuo, Chih-Chun | MediaTek Inc. |
| TGbn (Joint) | 2/1 | Lanante, Leonardo | Ofinno |
| TGbn (Joint) | 2/1 | Lee, Hong Won | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | LEE, JOONSOO | Newracom Inc. |
| TGbn (Joint) | 2/1 | LEE, Mingyu | Samsung Electronics Co., Ltd. |
| TGbn (Joint) | 2/1 | Lee, Wookbong | Apple Inc. |
| TGbn (Joint) | 2/1 | Li, Jialing | Qualcomm Technologies, Inc |
| TGbn (Joint) | 2/1 | Li, Weiyi | Spreadtrum Communication USA, Inc |
| TGbn (Joint) | 2/1 | Li, Yapu | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| TGbn (Joint) | 2/1 | Li, Yunbo | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Lou, Hanqing | InterDigital, Inc. |
| TGbn (Joint) | 2/1 | Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| TGbn (Joint) | 2/1 | LU, Yuxin | TCL |
| TGbn (Joint) | 2/1 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| TGbn (Joint) | 2/1 | Ma, Yongsen | SAMSUNG ELECTRONICS |
| TGbn (Joint) | 2/1 | Max, Sebastian | Ericsson AB |
| TGbn (Joint) | 2/1 | McCann, Stephen | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Minotani, Jun | Panasonic Corporation |
| TGbn (Joint) | 2/1 | Montemurro, Michael | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Morioka, Hitoshi | SRC Software |
| TGbn (Joint) | 2/1 | Motozuka, Hiroyuki | Panasonic Holdings Corporation |
| TGbn (Joint) | 2/1 | Mutgan, Okan | Nokia |
| TGbn (Joint) | 2/1 | Nayak, Peshal | Samsung Research America |
| TGbn (Joint) | 2/1 | Noh, Si-Chan | Newracom Inc. |
| TGbn (Joint) | 2/1 | Norouzi, Sara | Huawei Technologies Canada; Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Palayur, Saju | Maxlinear Inc |
| TGbn (Joint) | 2/1 | Park, Minyoung | Intel |
| TGbn (Joint) | 2/1 | Park, Sungjin | senscomm |
| TGbn (Joint) | 2/1 | Patil, Abhishek | Qualcomm Incorporated |
| TGbn (Joint) | 2/1 | Patwardhan, Gaurav | Hewlett Packard Enterprise |
| TGbn (Joint) | 2/1 | Petrick, Albert | Jones-Petrick and Associates, LLC. |
| TGbn (Joint) | 2/1 | Qi, Yue | Samsung Research America |
| TGbn (Joint) | 2/1 | Quan, Yingqiao | Spreadtrum Communications (Shanghai) Co., Ltd.; Unisoc (Shanghai) Technologies Co., Ltd. |
| TGbn (Joint) | 2/1 | Ratnam, Vishnu | Samsung Research America |
| TGbn (Joint) | 2/1 | RISON, Mark | Samsung Cambridge Solution Centre |
| TGbn (Joint) | 2/1 | Ryu, Kiseon | NXP Semiconductors |
| TGbn (Joint) | 2/1 | Schelstraete, Sigurd | MaxLinear |
| TGbn (Joint) | 2/1 | Seo, Sangho | Broadcom Corporation |
| TGbn (Joint) | 2/1 | Serizawa, Kazunobu | Advanced Telecommunications Research Institute International (ATR) |
| TGbn (Joint) | 2/1 | Sevin, Julien | Canon Research Centre France |
| TGbn (Joint) | 2/1 | Shafin, Rubayet | Samsung Research America |
| TGbn (Joint) | 2/1 | Shirakawa, Atsushi | SHARP CORPORATION |
| TGbn (Joint) | 2/1 | So, Youngwan | Samsung Electronics Co., Ltd. |
| TGbn (Joint) | 2/1 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Sun, Bo | Sanechips |
| TGbn (Joint) | 2/1 | Talarico, Salvatore | Sony Corporation |
| TGbn (Joint) | 2/1 | Tanaka, Yusuke | Sony Corporation |
| TGbn (Joint) | 2/1 | Taori, Rakesh | Infineon Technologies |
| TGbn (Joint) | 2/1 | Tsodik, Genadiy | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Tsujimaru, Yuki | Canon |
| TGbn (Joint) | 2/1 | Urabe, Yoshio | Panasonic Holdings Corporation |
| TGbn (Joint) | 2/1 | Val, Inaki | MaxLinear, Inc. |
| TGbn (Joint) | 2/1 | Varshney, Prabodh | Nokia |
| TGbn (Joint) | 2/1 | VIGER, Pascal | Canon Research Centre France |
| TGbn (Joint) | 2/1 | Wang, Lei | Huawei R&D USA |
| TGbn (Joint) | 2/1 | Wang, Qi | Apple Inc. |
| TGbn (Joint) | 2/1 | Wang, Ying | InterDigital, Inc. |
| TGbn (Joint) | 2/1 | Ward, Lisa | Rohde & Schwarz |
| TGbn (Joint) | 2/1 | Wei, Dong | NXP Semiconductors |
| TGbn (Joint) | 2/1 | Wu, Chao-Yi | SAMSUNG ELECTRONICS |
| TGbn (Joint) | 2/1 | Wu, Kanke | Apple Inc |
| TGbn (Joint) | 2/1 | Wullert, John | Peraton Labns |
| TGbn (Joint) | 2/1 | Xia, Qing | Sony Corporation |
| TGbn (Joint) | 2/1 | Yang, Jay | ZTE Corporation |
| TGbn (Joint) | 2/1 | Yang, Jimmy | Moxa Inc. |
| TGbn (Joint) | 2/1 | YANG, RUI | InterDigital, Inc. |
| TGbn (Joint) | 2/1 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| TGbn (Joint) | 2/1 | Yee, James | MediaTek Inc. |
| TGbn (Joint) | 2/1 | Yoon, Yelin | LG ELECTRONICS |
| TGbn (Joint) | 2/1 | Yu, Jian | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Zhang, Jiayi | Ofinno |
| TGbn (Joint) | 2/1 | Zhang, John | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| TGbn (Joint) | 2/1 | Zhang, Maolin | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Zhao, Yue | Huawei Technologies Co., Ltd |
| TGbn (Joint) | 2/1 | Zhong, Ke | Ruijie Networks Co., Ltd. |
| TGbn (Joint) | 2/1 | Zhou, Lei | H3C Technologies Co., Limited |
| TGbn (Joint) | 2/1 | Zhou, Pei | TCL |