IEEE P802.11  
Wireless LANs

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| Minutes for TGbn MAC Ad-Hoc teleconferences from September to November 2024 | | | | |
| Date: 2024-09-27 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Srinivas Kandala | Samsung Electronics |  |  | srini.k1@samsung.com |

Abstract

This document contains the meeting minutes for the TGbn MAC ad hoc teleconferences held between September 2024 and November 2024 meetings.

Revisions:

* Rev0: Added the minutes from the telephone conference held on September 23rd
* Rev1: Added the minutes from the telephone conference held on September 26th
* Rev2: Added the minutes from the telephone conference held on October 7th

Abbreviations:

* C: Comment.
* A: Answer.

# Monday, 23 September 2024, 07:00pm – 09:00pm ET (TGbn MAC ad hoc conference call)

Chairman: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex session.

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 7:01pm EDT. The Chair introduces himself and the Secretary, Srini (Samsung)
2. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
   * Nobody responds.
3. The Chair goes through the IEEE copyright policy and no comments received on the floor
4. The Chair recommends using IMAT for recording the attendance.
   * Please record your attendance during the conference call by using the IMAT system:
     1. 1) login to [imat](https://imat.ieee.org/attendance), 2) select “802.11 Telecons (<Month>)” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “TGbn <MAC/PHY/Joint> conference call that you are attending.
   * If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang ([xiaofei.wang@interdigital.com](mailto:xiaofei.wang@interdigital.coma)), Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com)), and Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com))

**Recorded attendance through Imat and e-mail:**

**Name Affiliation**

|  |  |
| --- | --- |
| Ajami, Abdel Karim | Apple Inc. |
| Zhang, Lyutianyang | Huawei Technologies Co., Ltd. |
| Zhang, Jiayi | Ofinno |
| Yee, James | MediaTek Inc. |
| Yang, Jimmy | Moxa Inc. |
| Yang, Jay | ZTE Corporation |
| Yang, Haorui | China Mobile |
| Yang, Hang | Ruijie Networks Co., Ltd. |
| Yan, Zhongjiang | Northwestern Polytechnical University |
| Xu, Yanchao | Amlogic |
| Xiao, Tong | Xiaomi Communications Co., Ltd. |
| Xia, Qing | Sony Corporation |
| Wullert, John | Peraton Labs |
| Wee, Gaius | Panasonic Holdings Corporation |
| Zhang, Maolin | Huawei Technologies Co., Ltd |
| Wang, Xiaofei | InterDigital, Inc. |
| VIGER, Pascal | Canon Research Centre France |
| Urabe, Yoshio | Panasonic Holdings Corporation |
| Talarico, Salvatore | Sony Corporation |
| Sung, Hyeonjun | WILUS Inc. |
| Shirakawa, Atsushi | SHARP CORPORATION |
| Shi, Zhenpeng | Huawei Technologies Co., Ltd |
| Shafin, Rubayet | Samsung Electronics |
| Sato, Takuhiro | SHARP CORPORATION |
| Sakamoto, Ryunosuke | SHARP CORPORATION |
| Sadiq, Bilal | Samsung Research America |
| Ryu, Kiseon | NXP Semiconductors |
| Quan, Yingqiao | Spreadtrum Communications (Shanghai) Co., Ltd.... |
| Quan, Li | ZTE Corporation |
| Wang, Qi | Apple Inc. |
| Qi, Yue | Samsung Research America |
| Zhao, Yue | Huawei Technologies Co., Ltd |
| Zhou, Pei | TCL |
| Zhou, Huixuan | OPPO |
| Petrick, Albert | InterDigital, Inc. |
| Perez, Javier | Ofinno |
| Patwardhan, Gaurav | Hewlett Packard Enterprise |
| Hart, Brian | Cisco Systems, Inc. |
| Hamilton, Mark | CommScope |
| Haider, Muhammad Kumail | Meta Platforms, Inc. |
| Ha, Taeyoung | Samsung Electronics Co., Ltd. |
| Gupta, Binita | Cisco Systems, Inc. |
| Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. |
| Gu, Jaheon | Samsung Electronics Co., Ltd. |
| Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.... |
| Fu, Qingwei | TP-Link Systems Inc. |
| Fischer, Matthew | Broadcom Corporation |
| Fang, Yonggang | MediaTek Inc. |
| Fan, Shuang | Sanechips Technology Co., Ltd. |
| Erkucuk, Serhat | Ofinno |
| Hasabelnaby, Mahmoud | Huawei Technologies Canada; Huawei Technologie... |
| Doppler, Klaus | Nokia |
| Dezfouli, Behnam | Nokia |
| Das, Subir | Peraton Labs |
| Cui, Yaoshen | TP-Link Systems Inc. |
| Coffey, John | Realtek Semiconductor Corp. |
| Chu, Liwen | NXP Semiconductors |
| Choi, JinHo | SAMSUNG ELECTRONICS |
| Chisci, Giovanni | Qualcomm Technologies, Inc |
| CHENG, yajun | Xiaomi Communications Co., Ltd. |
| Chen, Wei-Han | Mediatek Inc |
| Cha, Dongju | LG ELECTRONICS |
| Carney, William | Sony Group Corporation |
| Byeon, Seongho | SAMSUNG ELECTRONICS |
| Baykas, Tuncer | Ofinno |
| Dong, Xiandong | Xiaomi Communications Co., Ltd. |
| Hedayat, Ahmadreza | Apple Inc. |
| Helwa, Sherief | Qualcomm Incorporated; Qualcomm Technologies, Inc |
| Ho, Duncan | Qualcomm Technologies, Inc |
| Park, Sungjin | Senscomm |
| Ouchi, Masatomo | Canon |
| Noh, Si-Chan | Newracom Inc. |
| Nayak, Peshal | Samsung Research America |
| Naik, Gaurang | Qualcomm Technologies, Inc |
| Motozuka, Hiroyuki | Panasonic Holdings Corporation |
| Montemurro, Michael | Huawei Technologies Co., Ltd |
| Minotani, Jun | Panasonic Holdings Corporation |
| Mehrnoush, Morteza | Apple Inc. |
| Ma, Yongsen | SAMSUNG ELECTRONICS |
| Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| LU, Yuxin | TCL Industries |
| Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.... |
| Lou, Hanqing | InterDigital, Inc. |
| Li, Weiyi | Spreadtrum Communication USA, Inc |
| Lee, Hong Won | LG ELECTRONICS |
| Lanante, Leonardo | Ofinno |
| Kuo, Chih-Chun | MediaTek Inc. |
| Klein, Arik | Huawei Technologies Co., Ltd |
| Kim, Suhwook | SAMSUNG ELECTRONICS |
| Kim, Sang Gook | LG ELECTRONICS |
| Kim, Jungjun | Samsung Electronics |
| Kim, Geon Hwan | LG ELECTRONICS |
| Kandala, Srinivas | Samsung |
| Kalamkar, Sanket | Qualcomm Incorporated; Qualcomm Technologies, Inc |
| Kain, Carl | Noblis, Inc.; USDoT |
| Johnsson, Kerstin | Nokia |
| Inoue, Kyosuke | SHARP CORPORATION |
| Huang, Po-Kai | Intel Corporation |

1. The Chair reminds that the agenda can be found in [11-24/1643r2](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-02-00bn-sept-nov-tgbn-teleconference-agenda.docx). The Chair asks for the comments about the agenda.
   * Document 24/1452 author coud not attend the meeting and has been removed from agenda
   * Document 24/1473 will be presented by Qisheng Huang
   * No comments from the participantd
   * Agenda approved by unanimous consent
2. Annoucements:

The chair made the following announcement:

* + - Presentations to be uploaded at least 24 hours prior to the scheduled meeting. Those not uploaded in time will be removed from the queues.
    - Topics with many contributions and they might discuss similar concepts/issues. Please check with other members to harmonize/consolidate (co-authoring, harmonized SPs, etc).
    - Time allocated for each presentation is limited to 15 mins (20 if planned SP run). Make sure that contribution is presented well within this time limit and that you leave enough room for any Q&As (preferred). If no time left for Q&As then please use TGbn reflector.

1. Technical Submissions-MAP:
   1. [24/1467](https://mentor.ieee.org/802.11/dcn/24/11-24-1467-00-00bn-framework-of-multi-ap.pptx) Framework of Multi-AP Suhwook Kim (Samsung)

Discussion

* + - C: In agreement that both residential and enterprise should be addressed. On slide 5, it is stated that enterprise does not need much information over the air as it can be done otherwise. Also, having over-the DS to be in 11bn scope with a light touch is helpful
    - A: We agree that we need to consider the enterprise situation
    - C: Slide 5, agree with other commneter that we have coordination in both residential and enterprise. In the table, you say that there may be privacy issues, can you comment on it?
    - A: But if there is multi-AP sharing, there will be privacy issues
    - C: Last row of the table, what is CSN?
    - A: Coordinated Spatial Nulling
    - C: Is it different from CBF?
    - A: they are similar
    - C: It is said that there is no controller in residential. In the future I expect that there would be APs that can fulfill the coordinator function. So, we should not exclude the case.
    - A: Agreed
  1. [24/1473](https://mentor.ieee.org/802.11/dcn/24/11-24-1473-01-00bn-map-co-edca-to-improve-the-performance-of-edging-sta-follow-up.pptx) MAP co-EDCA to improve the perf. of edging STA Follow up Li Quan

Discussion

* + - C: Slide 5, looks like you are using saturated traffic models. How does this look when you have some thing like video, which is more periodic and not saturated?
    - A: We use saturated traffic model because this exposes the problem. For other models, this problem exists but not as severe, so showing the most important case here
    - C: I understand, but I dont expect saturated traffic models usually do well with VO
    - A: Do you mean that the real video would perform well in saturated traffic model and we have this issue in our simulation
    - C: It seem that AC\_VO is not a good way to have saturated traffic model
    - C: Trying to understand what the new item that are you are trying to address in the Straw Poll
    - A: The new feature is that the STA will provide new information and the associated AP will share this information with the other BSS and we will allow the STA to recommend the desired EDCA parameters for other STAs
    - C: It appears that some of these are already in the spec. May be good to double check
    - C: Slide 4. How does STA 1 know whether it is hidden or not? Is it a hidden node or channel access problem? If it is hidden, you want the AP to adjust the parameters for STA2 to STA3 and it seems that the AP needs to determine the edging and non-edging STAs then we may end up reducing the system throughput and probably not an efficient network decision to make
    - A: We are still digging out the most important statistic, which can derive the solution to the hidden node problem. I think this is an implementation problem and we are considering some prediction models and trying to judge whether we are able to solve the hidden node problem. The AP can just apply the recommendation from STA1 and it may know most of the statistic and the AP can consider the recommendation and may use the statistic measured by itself
    - C: Slide 6, what is the definition of channel access time
    - A: STA will contend for the channel and has one PPDU to transmit and time take to accessi the channel and the PPDU transmission
  1. [24/1595](https://mentor.ieee.org/802.11/dcn/24/11-24-1595-00-00bn-scope-of-mapc-and-roaming-standardization.pptx) Scope of MAPC and Roaming Standardization Brian Hart

Discussion

* + - C: Before defining the interfaces, we should decide on framework and architecture is and we need to understand them before we have the definitions
    - A: Understand the comment on dependency on architecture
    - C: not necessarily not complementary, we should just figure them out
    - A: Yes
    - C: One question on AP interfaces, slide 5 and slide 6, what are the main functions of the SME in the interfaces:
    - A: SME typically represents the AP vendor; enabling/disabling, policy, request/response, agreeing/disagreeing coming from policy engine and then the scheduler. Interface 3 is just trying to get this information securely to the peer entity
    - C: What is your understanding of mimumum set (lowest common denominator). While doing this it may preclude some other class of solutions
    - A: That is not the intention. Lowest common denominator still needs to show value to customer. To the earlier discussion, we want to solve both residential and enterprisee
    - C: Slide 5, step 3 – these two APs can only share the management frame and not the control frame?
    - A: My opinion is that there will be latency in this path and there will be encryption etc and I am not relying the interface to be fast. The control information would be sent over the wireless interface. Still it is a management and you should be able to handle low latency. However for C-TDMA, it should go over the air
  1. [24/1596](https://mentor.ieee.org/802.11/dcn/24/11-24-1596-01-00bn-consideration-of-map-coordination-on-npca-channel.pptx) Consideration of MAP coordination on NPCA channel Li Yan

Discussion

* + - C: Generally agree with the line of thinking. When NPCA is jointly involved with multi-AP, NPCA should be involved in the set up. However, in slide 5, each coordination sequence should be discussed separately, since in some cases, there may be some overlap, it may not be an issue for some coordination sequence
    - A: We have not given the detailed information on how a coordinated mechanism should work with NPCA. Yes, we should have more specific discussion for each of the mechanisms. In my thinking C-TDMA would work with NPCA and we can talk more about other groups
    - C: In case we have two APs with different NPCA primary channels. In your proposal, you want these NPCA primary channels to be aligned. Question is if two APs have two different NPCA primary channels do we need coordination? It is better to have them separate and not have coordination
    - A: In some examples, two APs have the same primary channel then it may not be easy to have different NPCA primary channels and keep them non-overlapping. However, in the case where the APs have wide bandwidth, then we can easily separate them out
    - C: Slide 6. It seems that the RNR carries only the basic information, TBTT offset etc. Do you want to add other information to RNR?
    - A: Yes, we need to add bandwidth information in RNR
    - C: If we have the two APs to have to address NPCA rules, we may want to add these rules here
    - A: Yes, we can decide on further coordination or not
    - C: In NPCA, the TXOP on the NPCA primary channel can be taken only if the peers see the same OBSS. Taking that view, the two APs and the two STAs should be the same OBSS, only then the NPCA transmissions will be successful. Any thoughts on that and what can be provided?
    - A: If I understand the question, AP1 may detect OBSS PPDU and AP2 may not. In this situation, the APs can exchange the AP list and for the same neighboring AP if they observe OBSS they can switch the channel. If the AP1 detects OBSS PPDU from neighboring AP but is not detected by AP2, we should not consider coordination. So the APs should exchange the list and then they have to coordinate

1. Technical Submissions-NPCA Part 1:
   1. [24/0868](https://mentor.ieee.org/802.11/dcn/24/11-24-0868-00-00bn-additional-considerations-on-non-primary-channel-access.pptx) Additional Considerations on NPCA Leonardo Lanante

Discussion

* + - C: Slide 5, if the STA detects transmission on NPCA primary channel, it will switch back to primary channel. In this case how does the STA set the NAV timer on the NPCA primary channel?
    - A: Our thinking is that it is a different time in the secondary channel, which is only relevant if it is in the NPCA, is that your question? Or you are thinking of using the same NAV timer?
    - C: For simplicity, it is better to have same timer. Do you think that they have to be different?
    - A: That is our initial thinking but we can consider same. But we do not want the STA that does not use NPCA performs better than NPCA
    - C: Slide 3, elaborate on physical CS
    - A: I mean that the CS can be detected from the PPDU, either a physical transmission or virtual
    - C: How do you know that the PPDU is covered by the NPCA primary channel
    - A: Based on the energy detection
    - C: But it may not be from the same source?
    - A: We can discuss further – for example check the bandwidth in the primary channel or high energy occuring in the secondary channel
  1. [24/1125](https://mentor.ieee.org/802.11/dcn/24/11-24-1125-01-00bn-considerations-on-switching-for-npca.pptx) Considerations on switching for NPCA Dongju Cha

Discussion

* + - C: On second bullet in slide 8, it feels like DSO scope. If we agree on DSO, we can think about this case
    - A: Yes
    - C: But we have not agreed about DSO. We can consider the case with DSO
    - C: Slide 4, for pre-HE PPDU, do you have any feel if the bandwidth is sigaled and if it is widely signaled in legacy implementations?
    - A: From my knowledge we can get the bandwith from HT-SIG and VHT-SIG-A field
    - C: So you are saying that sufficient information is available
    - A: Yes
    - C: Regarding DSO, I dont think we should mix NPCA and DSO as different devices have different bandwidths. I dont think we should a restriction that NPCA primary should be in operating bandwidth
    - C: Agree with the other commenter, then NPCA priary outside the operating bandwidth it is like DSO on which we do not have an agreement
    - C: Slide 7, channel switch delay from primary to NPCA primary, can you give an example? In EMLSR, there is only one switch delay, why are there two?
    - A: It can be dependent on the channel conditions, but I need to think on the details. Can i get back after thinking?
    - C: Sure, we can discuss further. But it will not be dependent on channel conditions and they would be same
    - C: The channel switch is a hardware capability and is known in advance and can be set. However, due to the differences to NAV timers, the channel switch time could be different
    - A: For pre-11ax, the switch delay can be hardware limited

1. There is no other business
2. Session adjourned at 9:00 PM ET

# Thursday, 26 September 2024, 10:00am – 12:00noon ET (TGbn MAC ad hoc conference call)

Chairman: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex session.

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 10:01am EDT. The Chair introduces himself and the Secretary, Srini (Samsung)
2. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
   * Nobody responds.
3. The Chair goes through the IEEE copyright policy and no comments received on the floor
4. The Chair recommends using IMAT for recording the attendance.
   * Please record your attendance during the conference call by using the IMAT system:
     1. 1) login to [imat](https://imat.ieee.org/attendance), 2) select “802.11 Telecons (<Month>)” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “TGbn <MAC/PHY/Joint> conference call that you are attending.
   * If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang ([xiaofei.wang@interdigital.com](mailto:xiaofei.wang@interdigital.coma)), Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com)), and Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com))

**Recorded attendance through Imat and e-mail:**

**Name Affiliation**

|  |  |
| --- | --- |
| Zhou, Huixuan | OPPO |
| Zhao, Yue | Huawei Technologies Co., Ltd |
| Yahya, Salim | VESTEL,IMU |
| Yan, Zhongjiang | Northwestern Polytechnical University |
| Xiao, Tong | Xiaomi Communications Co., Ltd. |
| Zhou, Lei | H3C Technologies Co., Limited |
| Sun, Bo | Sanechips Technology Co., Ltd. |
| Talarico, Salvatore | Sony Corporation |
| SUH, JUNG HOON | Huawei Technologies Canada; Huawei Technologie... |
| Zhong, Ke | Ruijie Networks Co.,Ltd. |
| Tanaka, Yusuke | Sony Corporation |
| Sung, Hyeonjun | WILUS Inc. |
| Tsujimaru, Yuki | Canon |
| Yang, Jay | ZTE Corporation |
| Urabe, Yoshio | Panasonic Holdings Corporation |
| Zhou, Pei | TCL |
| Zhang, Lyutianyang | Huawei Technologies Co., Ltd. |
| Val, Inaki | MaxLinear, Inc. |
| Verenzuela, Daniel | Sony Group Corporation |
| Wullert, John | Peraton Labs |
| Zhang, Jiayi | Ofinno |
| Yang, Haorui | China Mobile |
| Wang, Xiaofei | InterDigital, Inc. |
| Yee, James | MediaTek Inc. |
| Wee, Gaius | Panasonic Holdings Corporation |
| Yano, Kazuto | Advanced Telecommunications Research Institute... |
| Wang, Ying | InterDigital, Inc. |
| Zhao, Xuwen | TCL |
| Xu, Yanchao | Amlogic |
| AbidRabbu, Shaima' | VESTEL |
| Seo, Sangho | Broadcom Corporation |
| Fang, Yonggang | MediaTek Inc. |
| Fischer, Matthew | Broadcom Corporation |
| Fu, Qingwei | TP-Link Systems Inc. |
| Fujimori, Yuki | Canon Research Centre France |
| Ghosh, Chittabrata | Apple Inc. |
| Gu, Jaheon | Samsung Electronics Co., Ltd. |
| Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. |
| Fan, Shuang | Sanechips Technology Co., Ltd. |
| Gupta, Binita | Cisco Systems, Inc. |
| Handte, Thomas | Sony Group Corporation |
| Hart, Brian | Cisco Systems, Inc. |
| Hasabelnaby, Mahmoud | Huawei Technologies Canada; Huawei Technologie... |
| Hu, Chunyu | Spreadtrum Communications US |
| huang, kaikai | Nokia |
| Huang, Po-Kai | Intel Corporation |
| kamath, Manoj | Broadcom Corporation |
| Ha, Taeyoung | Samsung Electronics Co., Ltd. |
| Erkucuk, Serhat | Ofinno |
| Ekkundi, Manasi | SAMSUNG ELECTRONICS |
| Dezfouli, Behnam | Nokia |
| Aio, Kosuke | Sony Corporation |
| Ajami, Abdel Karim | Apple Inc. |
| Bai, Jiyang | TCL |
| Baykas, Tuncer | Ofinno |
| Bredewoud, Albert | Broadcom Corporation |
| Byeon, Seongho | SAMSUNG ELECTRONICS |
| Carney, William | Sony Group Corporation |
| Che, Hui | Ruijie Networks Co., Ltd |
| Chen, Junbin | TP-Link Systems Inc. |
| Chen, Wei-Han | Mediatek Inc |
| CHENG, yajun | Xiaomi Communications Co., Ltd. |
| Chisci, Giovanni | Qualcomm Technologies, Inc |
| Choi, JinHo | SAMSUNG ELECTRONICS |
| Chung, Chulho | SAMSUNG |
| Coffey, John | Realtek Semiconductor Corp. |
| Cui, Yaoshen | TP-Link Systems Inc. |
| Das, Subir | Peraton Labs |
| Kandala, Srinivas | Samsung |
| Karthik, S. G. | SAMSUNG ELECTRONICS |
| Kedem, Oren | Maxlinear |
| Kim, Jungjun | Samsung Electronics |
| McCann, Stephen | Huawei Technologies Co., Ltd |
| Mutgan, Okan | Nokia |
| Nayak, Peshal | Samsung Research America |
| Neishaboori, Azin | General Motors Company |
| Nezou, Patrice | Canon Research Centre France |
| Park, Sungjin | Senscomm |
| Patil, Abhishek | Qualcomm Incorporated |
| Perez, Javier | Ofinno |
| Pettersson, Charlie | Ericsson AB |
| Quan, Li | ZTE Corporation |
| Quan, Yingqiao | Spreadtrum Communications (Shanghai) Co., Ltd.... |
| Ratnam, Vishnu | Samsung Research America |
| RISON, Mark | Samsung Cambridge Solution Centre |
| Roy, Rishabh | SAMSUNG ELECTRONICS |
| Sadiq, Bilal | Samsung Research America |
| Sato, Takuhiro | SHARP CORPORATION |
| Schelstraete, Sigurd | MaxLinear |
| Ma, Yongsen | SAMSUNG ELECTRONICS |
| Shi, Zhenpeng | Huawei Technologies Co., Ltd |
| Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.... |
| Kim, Sang Gook | LG ELECTRONICS |
| Kim, Sanghyun | WILUS Inc. |
| Kim, Suhwook | SAMSUNG ELECTRONICS |
| Kishida, Akira | NTT |
| Klein, Arik | Huawei Technologies Co., Ltd |
| Koo, Jonghoe | SAMSUNG ELECTRONICS |
| Koundourakis, Michail | Samsung Cambridge Solution Center |
| Kuo, Chih-Chun | MediaTek Inc. |
| Lalam, Massinissa | SAGEMCOM BROADBAND SAS |
| Lanante, Leonardo | Ofinno |
| Lee, Hong Won | LG ELECTRONICS |
| Li, Weiyi | Spreadtrum Communication USA, Inc |
| li, yan | ZTE Corporation |
| Lim, Dong Guk | LG ELECTRONICS |
| Lim, Yeon Geun | Newracom Inc. |
| LIU, QINGLAI | Panasonic Holdings Corporation |
| Lou, Hanqing | InterDigital, Inc. |
| LU, Yuxin | TCL Industries |
| Montemurro, Michael | Huawei Technologies Co., Ltd |

1. The Chair reminds that the agenda can be found in [11-24/1643r4](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-04-00bn-sept-nov-tgbn-teleconference-agenda.docx). The Chair asks for the comments about the agenda.
   * No comments. Agenda is approved
2. Annoucements:
   * Chair reminds that presenters will have 15 minutes for presentations that do not have SPs associated, else 20 minutes if they have SPs associated
3. Technical Submissions-Security + Relay:
4. [24/0547](https://mentor.ieee.org/802.11/dcn/24/11-24-0547-00-00bn-secure-control-frames-follow-up.pptx) Secure Control frames - Follow Up Abhishek Patil

Discussion

* + C: I would like to understand the attack scenario. In slide 4, second bullet, if the attacker transmits then false information will be there. So I would like to understand when the attacker will transmit the frame as the BA frame will be sent withink SIFS after the soliciting frame.
  + A: When the BA frames are sent, the transmissions will be blocked and then the attacker will inject a such that originator will believe that all frames were received correctly

1. [24/0535](https://mentor.ieee.org/802.11/dcn/24/11-24-0535-00-00bn-trigger-ba-and-bar-protection-follow-up.pptx) Trigger, BA, and BAR Protection follow up Po-kai Huang

Discussion

* + C: Need to look at the impact of the vulnerability that you are trying to protect and the cost of protecting the vulnerability and if someone else can get around what you are protecting. My concerns are the encryption overhead for protecting control frames is huge. And if you start taking the protection it will start taking medium time. If the attacker can jam the channel and accomplsih the same thing, we can look at this and see ultimately what we are accomplishing. So we need to understand what we are gaining
  + A: It is only for control frames, so the overhead may not be much. Adding 28 bytes to the control frame for 4 ms. Comparing the attack vector to jamming is not the same. In jamming the frame is dropped but no negative effect otherwise
  + C: You mentioned that each key is at the MLD AP level. So how does this work for Multi-AP. Since the authentication is at the AP MLD level, i am not sure how this gets applied to Multi-AP
  + A: This presentation does not address Multi-AP level and focusses only on one BSS
  + C: Question regarding padding. Good thing to add padding after MIC, but however this may tighten the time to send the BAR
  + A: Why do you need to send BAR as an immediate response?
  + C: Some misunderstanding
  + A: Yes, for BA, we handle with the padding. BAR is not sent as an immediate response

1. [24/0820](https://mentor.ieee.org/802.11/dcn/24/11-24-0820-00-00bn-scs-proxy-for-relay.pptx) SCS proxy for relay Li Yan

Discussion

* + None

1. [24/1565](https://mentor.ieee.org/802.11/dcn/24/11-24-1565-00-00bn-further-considerations-on-data-unit-delivery-using-relaying.pptx) Further considerations on data unit delivery using relaying Serhat Erkucuk

Discussion

* + C: I am little bit perturbed with OOO delivery to upper layers. Part of it is to make sure that we are complying with 802.1 and the expectation is in-order delivery. If OOO delivery is done for the data that does not have sequence numbers, then there will be issues. It is better to have reordering buffer at STA 2
  + A: I agree with you in general. Then we have to change our approach with OOO delivery. Especially to be able to support low-latency traffic. I understand the complexity but there is a tradeoff

1. [24/1572](https://mentor.ieee.org/802.11/dcn/24/11-24-1572-00-00bn-enhancements-on-relaying-for-uhr.pptx) Enhancements on Relaying for UHR Tuncer Baykas

Discussion

* + None

1. [24/1578](https://mentor.ieee.org/802.11/dcn/24/11-24-1578-00-00bn-sounding-procedure-for-relay-operation.pptx) Sounding Procedure for Relay Operation Jiayi Zhang

Discussion

* + C: Why should the STA2 to sen feedback 2 to STA1
  + A: This is also like relay
  + C: What is the purpose as that is the feedback from STA3 to STA2? Why does STA1 need CSI between STA2 and STA3
  + A: AP1 may need the CSI between relay and destination. This is since relay will be moving, so getting the CSI may make AP to make decisions
  + C: You mentioned that the relay is a mobile device. So, when the relay moves both the channels change. Is this the typical case? If the relay is mobile the channels are not stable. If itmisnt a typical case, isnt relay stationary? If the relay is stationary then you will not need the CSI
  + A: But these days relays could be a cell phone in which case the channels may rapdly change
  + C: Here you mention relay STA, but you can use all the measurements to select the relay by checking the RSSI and CSI.
  + A: I agree
  + C: Slide 3, you probably do not need to have a report request and can be part of the trigger
  + A: Yes, this figure was from another contribution

1. Technical Submissions-NPCA Part 1:
2. [24/1155](https://mentor.ieee.org/802.11/dcn/24/11-24-1155-00-00bn-further-discussions-on-npca.pptx) Further discussions on NPCA Sanghyun Kim

Discussion

* + C: Slide 8, do you envision the specification to define these two modes that a STA can operate in mode 1 and mode 2? What is the motivation?
  + A: The two modes are proposed to provide enough degrees of freedom for implementer. This is because some implementers may only support mode 1
  + C: In that case, why not just the STAs do not enable NPCA mode if the NPCA primary is outside the operating channel
  + A: Yes, it could be that simple. But when an AP changes the NPCA primary channel, then the STA may or may not be able to follow it and having the two modes would help
  + C: Slide 3, third bullet. Can you clarify how the benefits are accomplished for mode 1?
  + A: For some cases, even if the STA support NPCA but may not be able to based on the NPCA primary channel location
  + C: Slide 3, STA2 and STA3 are hidden nodes for OBSS1. STA1 switches to NPCA priarmy channel and subsequently switched by STA2 and STA3. How does the AP know that STA2 and STA3 are switching?
  + A: AP does not know but these STAs may transmit frames to the AP when AP learns about their switch
  + C: But most of the transmissions will be downlink and they may not get a chance to transmit
  + A: Agree
  + C: Slide 5, NPCA primary channel location is somewhat implementation dependent, so I am wondering the rule in this slide may be in conflict with the channel measurement and the rule may not help
  + A: There might not be any rule for NPCA selection. This slide is merely trying to provide some guidance. AP can select any NPCA primary channel. But AP can use some conditions for selecting the primary channel.

1. [24/1218](https://mentor.ieee.org/802.11/dcn/24/11-24-1218-01-00bn-npca-next-level-discussions.pptx) NPCA - next level discussions Gaurang Naik

Discussion

* + Discussion delayed to the next session, which will be on Oct. 7

1. AOB
   * Chair announced that the next meeting is on Oct. 7
   * There is no other business
2. Session adjourned at 12:00 PM ET

# Monday, 7 October 2024, 07:00pm – 09:00pm ET (TGbn MAC ad hoc conference call)

Chairman: Xiaofei Wang (Interdigital)

Secretary: Srinivas Kandala (Samsung)

This meeting took place using a webex session.

**Introduction**

1. The Chair (Xiaofei, Interdigital) calls the meeting to order at 7:01pm EDT. The Chair introduces himself and the Secretary, Srini (Samsung)
2. The Chair reminds that the agenda can be found in [11-24/1643r6](https://mentor.ieee.org/802.11/dcn/24/11-24-1643-06-00bn-sept-nov-tgbn-teleconference-agenda.docx). The Chair asks for the comments about the agenda. Receiving no comments or objections, the agenda is approved
   * No comments. Agenda is approved
3. The Chair goes through the 802 and 802.11 IPR policy and procedures and asks if there is anyone that is aware of any potentially essential patents.
   * Nobody responds.
4. The Chair goes through the IEEE copyright policy and no comments received on the floor
5. The Chair recommends using IMAT for recording the attendance.
   * Please record your attendance during the conference call by using the IMAT system:
     1. 1) login to [imat](https://imat.ieee.org/attendance), 2) select “802.11 Telecons (<Month>)” entry, 3) select “C/LM/WG802.11 Attendance” entry, 4) click “TGbn <MAC/PHY/Joint> conference call that you are attending.
   * If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Xiaofei Wang ([xiaofei.wang@interdigital.com](mailto:xiaofei.wang@interdigital.coma)), Srinivas Kandala ([srini.k1@samsung.com](mailto:srini.k1@samsung.com)), and Jeongki Kim ([jeongki.kim.ieee@gmail.com](mailto:jeongki.kim.ieee@gmail.com))

**Recorded attendance through Imat and e-mail:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Affiliation** | |  |
| Koo, Jonghoe | SAMSUNG ELECTRONICS | | |
| Byeon, Seongho | SAMSUNG ELECTRONICS | | |
| Zhang, Lyutianyang | Huawei Technologies Co., Ltd. | | |
| Fischer, Matthew | Broadcom Corporation | | |
| Klein, Arik | Huawei Technologies Co., Ltd | | |
| Kishida, Akira | NTT |  |  |
| Zhang, Jiayi | Ofinno |  |  |
| Kim, Sang Gook | LG ELECTRONICS | |  |
| Zhao, Yue | Huawei Technologies Co., Ltd | | |
| Yukawa, Mitsuyoshi | Canon |  |  |
| Chu, Liwen | NXP Semiconductors | | |
| Kuo, Chih-Chun | MediaTek Inc. | |  |
| Kim, Jungjun | Samsung Electronics | | |
| Lee, Gwangho | Korea National University of Transportation | | |
| Yee, James | MediaTek Inc. | |  |
| Lee, Hong Won | LG ELECTRONICS | |  |
| Yano, Kazuto | Advanced Telecommunications Research Institute... | | |
| Fang, Yonggang | MediaTek Inc. | |  |
| Yang, Jimmy | Moxa Inc. |  |  |
| Levy, Joseph | InterDigital, Inc. | |  |
| Li, Weiyi | Spreadtrum Communication USA, Inc | | |
| Yoon, Yelin | LG ELECTRONICS | |  |
| Kim, Geon Hwan | LG ELECTRONICS | |  |
| Jang, Insun | LG ELECTRONICS | |  |
| Fujimori, Yuki | Canon Research Centre France | | |
| Gupta, Binita | Cisco Systems, Inc. | |  |
| Hart, Brian | Cisco Systems, Inc. | |  |
| Hasabelnaby, Mahmoud | Huawei Technologies Canada; Huawei Technologie... | | |
| Hedayat, Ahmadreza | Apple Inc. | |  |
| Gu, Xiangxin | Spreadtrum Communications (Shanghai) Co., Ltd. | | |
| Hervieu, Lili | CableLabs | |  |
| Hsu, Yung Lin | National Taiwan University | | |
| HUANG, CHIHAN | MediaTek Inc. | |  |
| Huang, Po-Kai | Intel Corporation | |  |
| Adachi, Tomoko | TOSHIBA Corporation | | |
| Gu, Jaheon | Samsung Electronics Co., Ltd. | | |
| Ajami, Abdel Karim | Apple Inc. | |  |
| Inohiza, Hirohiko | Canon |  |  |
| Inoue, Kyosuke | SHARP CORPORATION | | |
| Asai, Yusuke | Nippon Telegraph and Telephone Corporation (NTT) | | |
| Bai, Jiyang | TCL |  |  |
| Yang, Jay | ZTE Corporation | |  |
| Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.... | | |
| Kamel, Mahmoud | Interdigital Inc. | |  |
| Baykas, Tuncer | Ofinno |  |  |
| Kandala, Srinivas | Samsung |  |  |
| Zhong, Ke | Ruijie Networks Co.,Ltd. | | |
| li, yan | ZTE Corporation | |  |
| Lim, Yeon Geun | Newracom Inc. | |  |
| Cha, Dongju | LG ELECTRONICS | |  |
| Norouzi, Sara | Huawei Technologies Canada; Huawei Technologie... | | |
| Tseng, Yen Hsiung | MediaTek Inc. | |  |
| Taori, Rakesh | Infineon Technologies | | |
| Ouchi, Masatomo | Canon |  |  |
| Tanaka, Yusuke | Sony Corporation | |  |
| Chisci, Giovanni | Qualcomm Technologies, Inc | | |
| Park, Minyoung | Apple Inc. | |  |
| Park, Sungjin | Senscomm | |  |
| Patil, Abhishek | Qualcomm Incorporated | | |
| Sung, Hyeonjun | WILUS Inc. | |  |
| Perez, Javier | Ofinno |  |  |
| Sun, Bo | Sanechips Technology Co., Ltd. | | |
| Cui, Yaoshen | TP-Link Systems Inc. | | |
| SUH, JUNG HOON | Huawei Technologies Canada; Huawei Technologie... | | |
| Son, Ju-Hyung | WILUS Inc. | |  |
| Quan, Yingqiao | Spreadtrum Communications (Shanghai) Co., Ltd.... | | |
| Shirakawa, Atsushi | SHARP CORPORATION | | |
| Choi, JinHo | SAMSUNG ELECTRONICS | | |
| Ha, Taeyoung | Samsung Electronics Co., Ltd. | | |
| Shi, Zhenpeng | Huawei Technologies Co., Ltd | | |
| Roy, Rishabh | SAMSUNG ELECTRONICS | | |
| Shafin, Rubayet | Samsung Electronics | | |
| Serizawa, Kazunobu | Advanced Telecommunications Research Institute... | | |
| Ryu, Kiseon | NXP Semiconductors | | |
| Sadiq, Bilal | Samsung Research America | | |
| Schelstraete, Sigurd | MaxLinear | |  |
| Sakamoto, Ryunosuke | SHARP CORPORATION | | |
| Urabe, Yoshio | Panasonic Holdings Corporation | | |
| Sato, Takuhiro | SHARP CORPORATION | | |
| Dezfouli, Behnam | Nokia |  |  |
| Nogami, Toshizo | SHARP CORPORATION | | |
| LIU, QINGLAI | Panasonic Holdings Corporation | | |
| Lou, Hanqing | InterDigital, Inc. | |  |
| Yamada, Ryota | SHARP CORPORATION | | |
| Lu, Liuming | Guangdong OPPO Mobile Telecommunications Corp.... | | |
| Che, Hui | Ruijie Networks Co., Ltd | | |
| Fan, Shuang | Sanechips Technology Co., Ltd. | | |
| Xu, Yanchao | Amlogic |  |  |
| LU, Yuxin | TCL Industries | |  |
| Ma, Yongsen | SAMSUNG ELECTRONICS | | |
| Xiao, Tong | Xiaomi Communications Co., Ltd. | | |
| Erkucuk, Serhat | Ofinno |  |  |
| Xia, Qing | Sony Corporation | |  |
| Chen, Wei-Han | Mediatek Inc | |  |
| Mehrnoush, Morteza | Apple Inc. | |  |
| Wullert, John | Peraton Labs | |  |
| Wei, Dong | Guangdong OPPO Mobile Telecommunications Corp.... | | |
| Minotani, Jun | Panasonic Holdings Corporation | | |
| Montemurro, Michael | Huawei Technologies Co., Ltd | | |
| Wee, Gaius | Panasonic Holdings Corporation | | |
| Motozuka, Hiroyuki | Panasonic Holdings Corporation | | |
| Wang, Ying | InterDigital, Inc. | |  |
| Dong, Xiandong | Xiaomi Communications Co., Ltd. | | |
| Naik, Gaurang | Qualcomm Technologies, Inc | | |
| Wang, Xiaofei | InterDigital, Inc. | |  |
| CHENG, yajun | Xiaomi Communications Co., Ltd. | | |
| NANDAGOPALAN, SAI SHANKAR | Synaptics Inc | |  |
| Nayak, Peshal | Samsung Research America | | |
| Noh, Si-Chan | Newracom Inc. | |  |
| Coffey, John | Realtek Semiconductor Corp. | | |

1. Announcements
   * Chair reminds that presenters will have 15 minutes for presentations that do not have SPs associated, else 20 minutes if they have SPs associated
2. Technical Presentations -NPCA Part 2:
3. [24/1218](https://mentor.ieee.org/802.11/dcn/24/11-24-1218-01-00bn-npca-next-level-discussions.pptx) NPCA - next level discussions Gaurang Naik [Q&A]

Discussion

* + C:Slide 8, there are some contributions are talking about their view of their problem. For example if a STA detects transmisison from OBSS, then the STA should switch to NPCA and if it detects from an AP that is not an OBSS then it shall not jump to the NPCA. So, why not just use this principle?
  + A: While I agree that your mechanism mitigates slightly it will not solve the problem completely since the STA has to track all APs and unless there is a way to monitor and enforce. The problem would still be there
  + C: Question on switch and switch back delay. Can you provide an example where these are different?
  + A: This is a very implementation-specific and it is not easy for me to say why this will be different. If the implementation is such that they are identical or different, you can indicate them accordingly. Also, in EMLSR and EMLMR, you have both switch and switch-back delay
  + C: I do not think that there will be too different and a single field may be sufficient

1. [24/1222](https://mentor.ieee.org/802.11/dcn/24/11-24-1222-01-00bn-npca-follow-up.pptx) NPCA Follow up Liwen Chu

Discussion

* + C: Slide 3, You have analyzed the NPCA primary channel does not cover the operation channel. This is like DSO. Do you think DSO is a mode of NPCA or will it be another mode?
  + A: This is NPCA.The STA may not use the full bandwidth as operational channel
  + C: if the other channel is not in the operating channel, then it would be DSO
  + A: We have different opinions on what is DSO
  + C: Question on NPCA Switch Threshold. Do you need to subtract the switch delay and switch back delay to see if it reches the NPCA switch threshold
  + A: Tthe switch and switch back should be included in the calculation of the time available and apply the threshold

1. [24/1259](https://mentor.ieee.org/802.11/dcn/24/11-24-1259-02-00bn-sp-based-non-primary-channel-access-follow-up.pptx) Sp-based non-primary channel access follow-up Yue Zhao

Discussion

* + C: You validate OBSS PPDU. In the PPDU you check the NAV. If the NAV is too short, will you wait until the end of the SP or switch sooner
  + A: Open to it, but switching when the shorter timer ends; either the TXOP ends or SP ends
  + C: It sounds like NPCA based TXOP
  + C: Slide 6, all scenarios have SP overlapping with R-TWT. From this, I feel that BSS2 and BSS3 are being penalized and they cannot use their SPs
  + A: There is no penalty and BSS 1 will be using primary and it is better for BSS2 and BSS# to switch their operating channels
  + C: You are considering the TXOP based NPCA. If the SP based NPCA, then how to support legacy device as legacy has no idea of the R-TWT. If TXOP based SPCA, then it is ok, but problem if it is SP based NPCA to support legacy
  + A: There are beneficial scenarios for SP based NPCA. If the primary is occupied, then legacy may be affected. But if primary channel is too busy legacy would be still affected and there would not be any more impact on legacy

1. [24/1260](https://mentor.ieee.org/802.11/dcn/24/11-24-1260-00-00bn-further-considerations-on-npca.pptx) Further considerations on NPCA Liuming Lu

Discussion

* + No time for discussion

1. [24/1093](https://mentor.ieee.org/802.11/dcn/24/11-24-1093-00-00bn-special-scenarios-in-non-primary-channel-access.pptx) Special scenarios in Non-Primary Channel Access Sindhu Verma

* Postponed to a subsequent meeting as the presenter was not available

1. [24/1104](https://mentor.ieee.org/802.11/dcn/24/11-24-1104-01-00bn-some-details-on-npca.pptx) Some details on NPCA Seongho Byeon

Discussion

* + C: Slide 9, third bullet, is it same as the NPCA duration
  + A: No, it is not. It is a shorter duration if the STA does not receive the ICF, it will switch back to the primary channel
  + C: If the OBSS is still ongoing on the primary channel, why switch back?
  + A: That is because it is possinle that the AP is doing something else on the primary channel without any OBSS interference
  + C: Slide 9, you state that the STA and AP can be triggered by different OBSS. That means the STA may switch to NPCA channel later than the AP and may miss the AP transmisison. Does it mean that the STA will miss the entire NPCA duration
  + A: This is an interesting problem and may need to be solved. How to recover and initiate transmission is TBD and will need to discuss further

1. [24/1192](https://mentor.ieee.org/802.11/dcn/24/11-24-1192-01-00bn-selective-non-primary-channel-access.pptx) Selective non-primary channel access Jonghoe Koo

Discussion

* + C: Slide 7, you propose two groups and they transmit at different times. What is the motivation for this scheme? Do you think there will be lot of OBSS interference affecting one group over the other
  + A: This is to handle scheduling. Even though there are many OBSS inteference sources, the motivation is not to move all the STAs to be moved. Maybe based on the type of OBSS, we can set one group to transmit

1. [24/1394](https://mentor.ieee.org/802.11/dcn/24/11-24-1394-00-00bn-npca-operation-issues.pptx) NPCA Operation Issues Seongho Byeon

Discussion

* + C: Slide 6, for this particular case, when the STA1 is hiddden and sends RTS and the AP sends CTS in the legacy format, since there is no identifier, there is no way to tell who sent it.
  + A: That is correct

1. AOB
   * Chair announced that he will not be available for some future meetings and will be covered by other MAC ad hoc chairs and the TG leadership.
   * There is no other business
2. Session adjourned at 8:59 PM ET