IEEE P802.11 Wireless LANs

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| Minutes for TGbe MAC Ad-Hoc teleconferences in July and September 2020 | | | | |
| Date: 2020-07-13 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | Email |
| Jeongki Kim | LG Electronics |  |  |  |
| Liwen Chu | NXP |  |  |  |
|  |  |  |  |  |

Abstract

This document contains the meeting minutes for the TGbe MAC ad hoc teleconferences held in July 2020 and September 2020.

Revisions:

* Rev0: Added the minutes from the telephone conferences held on July 13, 2020.

**Monday 13 July 2020, 19:00 –21:00 ET (TGbe MAC ad hoc conference call)**

Chairman: Liwen Chu (NXP)

Secretary: Jeongki Kim (LG Electronics)

This meeting took place using a webex session.

**Introduction**

1. The Chair (Liwen, NXP) calls the meeting to order at 10:04am EDT. The Chair introduces himself and the Secretary, Jeongki Kim (LG)
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 speaks up.
3. 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 “TGbe <MAC/PHY/Joint> conference call that you are attending.
   * If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Liwen Chu ([liwen.chu@nxp.com](mailto:liwen.chu@nxp.com)) and Jeongki Kim ([jeongki.kim@lge.com](mailto:jeongki.kim@lge.com))

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

|  |  |
| --- | --- |
| Name | Affiliation |
| Abdelaal, Rana | Broadcom Corporation |
| AbidRabbu, Shaima' | Istanbul Medipol University; Vestel |
| Abouelseoud, Mohamed | Sony Corporation |
| Aboulmagd, Osama | Huawei Technologies Co.,  Ltd |
| Abushattal, Abdelrahman | Istanbul Medipol university ;Vestel |
| Adachi, Tomoko | TOSHIBA Corporation |
| Adhikari, Shubhodeep | Broadcom Corporation |
| Agarwal, Peyush | Broadcom Corporation |
| Agrawal, Sandeep | C-DOT/Centre for Development of Telematics |
| Ahn, Woojin | Korea Railroad Research Institute (KRRI) |
| Alayasra, Musab | Medipol University; Vestel |
| Alex, Sam | Facebook |
| Asai, Yusuke | Nippon Telegraph and Telephone Corporation (NTT) |
| Asterjadhi, Alfred | Qualcomm Incorporated |
| Au, Kwok Shum | Huawei Technologies Co.,  Ltd |
| Au, Oscar | Origin Wireless |
| Auluck, Vijay | Self |
| Baek, SunHee | LG ELECTRONICS |
| Bajko, Gabor | MediaTek Inc. |
| Banerjea, Raja | Qualcomm Incorporated |
| Bankov, Dmitry | IITP RAS |
| baron, stephane | Canon Research Centre France |
| Bhandaru, Nehru | Broadcom Corporation |
| Bims, Harry | Bims Laboratories, Inc. |
| Bober, Lennert | Fraunhofer Heinrich Hertz Institute |
| Calcev, George | Futurewei Technologies |
| Cariou, Laurent | Intel Corporation |
| Carney, William | Sony Corporation |
| Cavalcanti, Dave | Intel Corporation |
| Cha, Jaesun | Electronics and Telecommunications Research Institute (ETRI) |
| CHAN, YEE | Facebook |
| Chen, Cheng | Intel Corporation |
| Chen, Cheng-Ming | Qualcomm Incorporated |
| Chen, Na | MaxLinear Corp |
| Cheng, Paul | MediaTek Inc. |
| CHERIAN, GEORGE | Qualcomm Incorporated |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. |
| Chu, Liwen | NXP Semiconductors |
| Chung, Chulho | SAMSUNG |
| Cordeiro, Carlos | Intel Corporation |
| Das, Dibakar | Intel Corporation |
| Das, Subir | Perspecta Labs Inc. |
| Derham, Thomas | Broadcom Corporation |
| de Vegt, Rolf | Qualcomm Incorporated |
| Dong, Xiandong | Xiaomi Inc. |
| Fang, Yonggang | ZTE TX Inc |
| Fischer, Matthew | Broadcom Corporation |
| Gan, Ming | Huawei Technologies Co., Ltd |
| Garg, Lalit | Broadcom Corporation |
| Ghosh, Chittabrata | Intel Corporation |
| GUIGNARD, Romain | Canon Research Centre France |
| Guo, Yuchen | Huawei Technologies Co., Ltd |
| Hamilton, Mark | Ruckus/CommScope |
| Han, Jonghun | SAMSUNG |
| HAN, Xiao | Huawei Technologies Co., Ltd |
| Han, Zhiqiang | ZTE Corporation |
| Henry, Jerome | Cisco Systems, Inc. |
| Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) |
| Hirata, Ryuichi | Sony Corporation |
| Hiroki, Shigeru | Canon Research Centre France |
| Ho, Duncan | Qualcomm Incorporated |
| Hong, Hanseul | Yonsei University |
| Hsu, Chien-Fang | MediaTek Inc. |
| Hu, Chunyu | Facebook |
| Hu, Glenn | Tencent |
| Huang, Guogang | Huawei |
| Huang, Po-Kai | Intel Corporation |
| Huang, Xiaolong | Qualcomm Incorporated |
| Hwang, Sung Hyun | Electronics and Telecommunications Research Institute (ETRI) |
| IDO, Tetsuo | Canon |
| Inohiza, Hirohiko | Canon Inc. |
| Inoue, Yasuhiko | Nippon Telegraph and Telephone Corporation (NTT) |
| Iwatani, Junichi | Nippon Telegraph and Telephone Corporation (NTT) |
| Jang, Insun | LG ELECTRONICS |
| Ji, Chenhe | Huawei Technologies Co. Ltd |
| Jiang, Jinjing | Apple Inc. |
| Jones, Allan | Activision |
| Jones, Vincent Knowles IV | Qualcomm Incorporated |
| Jung, hyojin | Hyundai Motor Company |
| JUNG, MYUNG CHEUL | Pantech Inc. |
| Kain, Carl | USDoT |
| Kakani, Naveen | Qualcomm Incorporated |
| Kandala, Srinivas | SAMSUNG |
| Kerry, Stuart | OK-Brit; Ruckus; CommScope |
| Khericha, samir | BRoadcom |
| Khorov, Evgeny | IITP RAS |
| Kim, Jeongki | LG ELECTRONICS |
| kim, namyeong | LG ELECTRONICS |
| Kim, Sang Gook | LG ELECTRONICS |
| Kim, Sanghyun | WILUS Inc |
| Kim, Yongho | Korea National University of Transportation |
| Kim, Youn-Kwan | The Catholic University of Korea |
| Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| Klein, Arik | Huawei Technologies Co. Ltd |
| Klimakov, Andrey | Huawei Technologies Co., Ltd |
| Kneckt, Jarkko | Apple Inc. |
| Ko, Geonjung | WILUS Inc. |
| Kondo, Yoshihisa | Advanced Telecommunications Research Institute International (ATR) |
| Kumar, Manish | Marvell Semiconductor, Inc. |
| Kwak, Jin-Sam | WILUS Inc. |
| Kwon, Young Hoon | NXP Semiconductors |
| Lan, Zhou | Broadcom Corporation |
| Lee, Hyeong Ho | Netvision Telecom Inc. |
| Lee, Jae Seung | Electronics and Telecommunications Research Institute (ETRI) |
| Lee, Nancy | Signify |
| Le Houerou, Brice | Canon Research Centre France |
| Li, Bo | Northwestern Polytechnical University |
| Li, Guoqing | Apple Inc. |
| Li, Nan | ZTE Corporation |
| Li, Yiqing | Huawei Technologies Co. Ltd |
| Li, Yunbo | Huawei Technologies Co., Ltd |
| Lin, Wei | Huawei Technologies Co. Ltd |
| Liu, Jeff | Broadcom Corporation |
| Liu, Yong | Apple Inc. |
| Loginov, Vyacheslav | IITP RAS |
| Lu, Liuming | ZTE Corporation |
| Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| Lv, kaiying | MediaTek Inc. |
| Lv, Lily | Huawei Technologies Co. Ltd |
| Ma, Mengyao | HUAWEI |
| Merlin, Simone | Qualcomm Incorporated |
| Mohanty, Bibhu | Qualcomm Incorporated |
| Monajemi, Pooya | Cisco Systems, Inc. |
| Morioka, Hitoshi | SRC Software |
| Motozuka, Hiroyuki | Panasonic Corporation |
| Murti, Wisnu | SeoulTech |
| Myles, Andrew | Cisco Systems, Inc. |
| Nagai, Yukimasa | Mitsubishi Electric Research Labs (MERL) |
| NAGATA, KENGO | Nippon Telegraph and Telephone Corporation (NTT) |
| Nakano, Hiroki | CAHI Corporation |
| NANDAGOPALAN, SAI SHANKAR | Cypress Semiconductor Corporation |
| Naribole, Sharan | SAMSUNG |
| Nezou, Patrice | Canon Research Centre France |
| Nguyen, An | DHS/CISA |
| Nurani Krishnan, Neelakantan | Qualcomm Incorporated |
| Ohsawa, Tomoki | NICT |
| Okada, Hiraku | Nagoya University |
| Omar, Hassan | Huawei Technologies Co.,  Ltd |
| Orlik, Philip | Mitsubishi Electric Research Labs (MERL) |
| Ouchi, Masatomo | Canon |
| Palm, Stephen | Broadcom Corporation |
| Pan, Chun | HUAWEI |
| Park, Minyoung | Intel Corporation |
| Patil, Abhishek | Qualcomm Incorporated |
| Patwardhan, Gaurav | Hewlett Packard Enterprise |
| Petranovich, James | ViaSat, Inc. |
| Petrick, Albert | InterDigital, Inc. |
| Petry, Brian | Broadcom Corporation |
| Purwita, Ardimas | University of Edinburgh |
| Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| Qi, Emily | Intel Corporation |
| Raissinia, Alireza | Qualcomm Incorporated |
| Rantala, Enrico-Henrik | Nokia |
| Rosdahl, Jon | Qualcomm Technologies, Inc. |
| Ryan, Mike | Ford Motor Company |
| Sadeghi, Bahareh | Intel Corporation |
| Sakamoto, Takenori | Panasonic Corporation |
| Sakoda, Kazuyuki | Sony Corporation |
| Salem, Mohamed | Huawei Technologies Co., Ltd |
| Salman, Hanadi | Istanbul Medipol University; VESTEL |
| Sambasivan, Sam | AT&T |
| Sandhu, Shivraj | Qualcomm Incorporated |
| Sedin, Jonas | Ericsson AB |
| Seok, Yongho | MediaTek Inc. |
| Sevin, Julien | Canon Research Centre France |
| Sherlock, Ian | Texas Instruments Incorporated |
| Siyari, Peyman | Qualcomm Incorporated |
| Solaija, Muhammad Sohaib | Istanbul Medipol University; Vestel |
| Son, Ju-Hyung | WILUS Inc. |
| Song, Taewon | LG ELECTRONICS |
| Startsev, Ivan | IITP RAS |
| Stott, Noel | Keysight Technologies |
| Su, Hang | Broadcom Corporation |
| Sumi, Takenori | Mitsubishi Electric Corporation |
| Sun, Li-Hsiang | InterDigital, Inc. |
| Sun, Yanjun | Qualcomm Incorporated |
| Takai, Mineo | Space-Time Engineering |
| Tanaka, Yusuke | Sony Corporation |
| Tomoyuki, Takada | Canon |
| Torab Jahromi, Payam | Facebook |
| Umehara, Makoto | Canon |
| Verma, Lochan | Qualcomm Incorporated |
| Verma, Sindhu | Broadcom Corporation |
| VIGER, Pascal | Canon Research Centre France |
| Wang, Chao Chun | MediaTek Inc. |
| Wang, Hao | Tencent |
| Wang, Huizhao | Quantenna Communications, Inc. |
| Wang, Lei | Huawei R&D USA |
| Wang, Qi | Apple Inc. |
| Wang, Xiaofei | InterDigital, Inc. |
| Wang, Yi-Hsiu | Zeku |
| Want, Roy | Google |
| Wilhelmsson, Leif | Ericsson AB |
| Wullert, John | Perspecta Labs |
| Xin, Liangxiao | Sony Corporation |
| Xue, Qi | Qualcomm Incorporated |
| Yan, Zhongjiang | Northwestern Polytechnical University |
| Yang, Bo | Huawei Technologies Co. Ltd |
| Yang, Jay | Nokia |
| Yang, Mao | Northwestern Polytechnical University |
| Yang, Yunsong | Futurewei Technologies |
| Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| Yee, James | MediaTek Inc. |
| Yee, Peter | NSA-CSD |
| yi, yongjiang | Futurewei Technologies |
| Yin, Yue | HUAWEI |
| Yong, Su Khiong | Apple Inc. |
| Yoshikawa, Yuki | Canon |
| Yukawa, Mitsuyoshi | Canon, Inc. |
| Zhang, Meihong | Huawei Technologies Co., Ltd |
| Zhou, Yifan | Huawei Technologies Co., Ltd |
| Zou, Tristan | Qualcomm Incorporated |
| Zuo, Xin | Tencent |
| Baokun Ding | Huawei Technologies Co., Ltd |

The Chair went over the document 11-20-0997-03-00be related to spec text volunteers and status. The Chair reminds that the agenda can be found in 11-20/927r6. The agenda is modified slightly and approved.

**Submissions**

1. 357r4 **Container for advertising ML Information** Abhishek Patil [SP only]

SP 7

* **Do you agree to include a Control field in Multi-Link element to indicate the presence of certain fields?**

C: is it in common field?

A: I’m supporting more than one profile

Approved with unanimous consent

1. 396r5 MLO BSS Information Transmission and Multiple BSSID Support, Liwen Chu (NXP) **[SP only]**

SP3: **Do you agree that AP’s Beacon and probe response shall not include ML element for MLD with no affiliated APs operating on this link**?

Yes/No/Abstain/No Answer: 35/27/62/68

1. 20/503r2, BSS parameter update for Multi-link Operation, Ming Gan (Huawei) [SP only]

SP1: Do you agree to amend the SP#77 by adding the following bullet?

* The reported AP in the AP MLD is identified by a TBD field, which is used together with Change Sequence Number field
* TBD field could be either the existing field or additional field

C: can you also show SP 77?

C: which element can contain TBD field?

A: RNR element or ML element can contain it. I will provide the details of it later. Now is TBD.

SP is deferred

1. 20/0770r1, MLO: AID allocation, Yoong Hoon Kwon [SP only]

**Do you support in TGbe SFD that**

The AID assigned to a non-AP MLD shall be unique and shall be set to a value greater than or equal to 2^n where n is the maximum value of the MaxBSSID Indicator amongst the multiple BSSID set(s) operating on any link of the AP MLD.

Yes/No/Abstain/No Answer: 54/19/44/76

1. [772r1](https://mentor.ieee.org/802.11/dcn/20/11-20-0772-01-00be-multi-link-element-format.pptx) Multi-link element format (Rojan Chitrakar)

Summary: Proposing details of multi-link element. Defining the Type field for carrying the different contents as well as Presence bitmap

Disucssion:

C: Presence bitmap indicates which fields are included or not. How does the type field help?

A: Type field indicates the format for common or per-link. I want to give more flexibility. This is similar to Trigger frame. If it’s not, we will have universial format.

C: If we have universial format, we can have several different combinations by presence bitmap.

C: Need to make simple ML element format. It seems like complex format.

C: Presence bitmap is enough. Need more disucssion.

SP is deferred.

1. [883r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0883-00-00be-multi-link-spatial-multiplexing.pptx) Multi-link Spatial Multiplexing (Yongho Seok)

Summary: Multi-link Spatial Multiplexing method with receive chain switching and transmit chain switching operation

Discussion:

C: slide 5, the switching time is larger than 80us?

A: Yes, additionally STA can indicate the switching delay to AP. Based on the information, AP can use MU-RTS with padding instead of RTS

C: You’re assuming the 1 TXOP for OM Control.

A: You can use Operating mode indication frame.

C: slide 9, 10, can we use this for enhanced single link MLD feature as well?

A: Yes

The teleconference was adjourned at 09:00pm EDT

**Wendsday 15 July 2020, 10:00 –12:00 ET (TGbe MAC ad hoc conference call)**

Chairman: Liwen Chu (NXP)

Secretary: Jeongki Kim (LG Electronics)

This meeting took place using a webex session.

**Introduction**

1. The Chair (Liwen, NXP) calls the meeting to order at 10:03am EDT. The Chair introduces himself and the Secretary, Jeongki Kim (LG)
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 speaks up.
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   * If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Liwen Chu ([liwen.chu@nxp.com](mailto:liwen.chu@nxp.com)) and Jeongki Kim ([jeongki.kim@lge.com](mailto:jeongki.kim@lge.com))

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

|  |  |
| --- | --- |
| Name | Affiliation |
| Abdelaal, Rana | Broadcom Corporation |
| AbidRabbu, Shaima' | Vestal Company, Istanbul Medipol University; |
| Aboulmagd, Osama | Huawei Technologies Co.,  Ltd |
| Abushattal, Abdelrahman | Vestal Company, Istanbul Medipol University; |
| Adachi, Tomoko | TOSHIBA Corporation |
| Adhikari, Shubhodeep | Broadcom Corporation |
| Agarwal, Peyush | Broadcom Corporation |
| Ahn, Woojin | Korea Railroad Research Institute (KRRI) |
| Aio, Kosuke | Sony Corporation |
| AKHTAR, NADEEM | Arista Networks, Inc. |
| Alayasra, Musab | Medipol University; Vestel |
| Alex, Sam | Facebook |
| Asterjadhi, Alfred | Qualcomm Incorporated |
| Avrillon, Matthieu | Luceor |
| B, Hari Ram | NXP Semiconductors |
| Baek, SunHee | LG ELECTRONICS |
| Baik, Eugene | Qualcomm Incorporated |
| Banerjea, Raja | Qualcomm Incorporated |
| Bankov, Dmitry | IITP RAS |
| baron, stephane | Canon Research Centre France |
| BECHADERGUE, Bastien | OLEDCOMM |
| Bei, Jianwei | NXP Semiconductors |
| Ben Arie, Yaron | toga networks(a huawei company) |
| Bhandaru, Nehru | Broadcom Corporation |
| Bims, Harry | Bims Laboratories, Inc. |
| Bluschke, Andreas | Signify |
| Bober, Lennert | Fraunhofer Heinrich Hertz Institute |
| Boldy, David | Broadcom Corporation |
| Bredewoud, Albert | Broadcom Corporation |
| Calcev, George | Futurewei Technologies |
| Cao, Rui | NXP Semiconductors |
| Cariou, Laurent | Intel Corporation |
| Carney, William | Sony Corporation |
| Cavalcanti, Dave | Intel Corporation |
| Cha, Jaesun | Electronics and Telecommunications Research Institute (ETRI) |
| CHAN, YEE | Facebook |
| Chen, Cheng | Intel Corporation |
| Chen, Cheng-Ming | Qualcomm Incorporated |
| Chen, Evelyn | Ericsson AB |
| Chen, Na | MaxLinear Corp |
| Cheng, Paul | MediaTek Inc. |
| CHERIAN, GEORGE | Qualcomm Incorporated |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. |
| Choo, Seungho | Senscomm Semiconductor Co., Ltd. |
| Chu, Liwen | NXP Semiconductors |
| CHUN, JINYOUNG | LG ELECTRONICS |
| Chung, Bruce | Realtek Semiconductor Corp. |
| Chung, Chulho | SAMSUNG |
| Ciochina, Dana | Sony Corporation |
| Das, Dibakar | Intel Corporation |
| Das, Subir | Perspecta Labs Inc. |
| Davies, Robert | Signify |
| DeLaOlivaDelgado, Antonio | InterDigital, Inc. |
| Derham, Thomas | Broadcom Corporation |
| de Vegt, Rolf | Qualcomm Incorporated |
| Ding, Baokun | Huawei Technologies Co., Ltd |
| Dogukan, Ali | Vestel |
| Dong, Xiandong | Xiaomi Inc. |
| Duan, Ruchen | SAMSUNG |
| Edgar, Richard | Imagination Technologies Ltd. |
| ElSherif, Ahmed | Qualcomm Incorporated |
| Erceg, Vinko | Broadcom Corporation |
| Fang, Yonggang | ZTE TX Inc |
| Feng, Xiang | Keysight Technologies |
| Fischer, Matthew | Broadcom Corporation |
| Gan, Ming | Huawei Technologies Co., Ltd |
| Gardner, James | Qualcomm Incorporated |
| Garg, Lalit | Broadcom Corporation |
| Ghosh, Chittabrata | Intel Corporation |
| Godbole, sachin | Broadcom Corporation |
| Goto, Fumihide | Self |
| Grandhe, Niranjan | NXP Semiconductors |
| GUIGNARD, Romain | Canon Research Centre France |
| Guntupalli, Lakshmikanth | Ericsson AB |
| Guo, Yuchen | Huawei Technologies Co., Ltd |
| Haider, Muhammad Kumail | Facebook |
| Hamilton, Mark | Ruckus/CommScope |
| HAN, CHONG | pureLiFi |
| Han, Jonghun | SAMSUNG |
| Han, Zhiqiang | ZTE Corporation |
| Handte, Thomas | Sony Corporation |
| Harrison, Edward | Anritsu Company |
| Hervieu, Lili | Cable Television Laboratories Inc. (CableLabs) |
| Hiertz, Guido | Ericsson GmbH |
| Hirata, Ryuichi | Sony Corporation |
| Hiroki, Shigeru | Canon |
| Ho, Duncan | Qualcomm Incorporated |
| Hong, Hanseul | Yonsei University |
| Hsieh, Hung-Tao | MediaTek Inc. |
| Hsu, Chien-Fang | MediaTek Inc. |
| Hu, Chunyu | Facebook |
| Hu, Glenn | Tencent |
| Hu, Mengshi | HUAWEI |
| Huang, Guogang | Huawei |
| Huang, Lei | Panasonic Asia Pacific Pte Ltd. |
| Huang, Po-Kai | Intel Corporation |
| Huang, Xiaolong | Qualcomm Incorporated |
| Hwang, Sung Hyun | Electronics and Telecommunications Research Institute (ETRI) |
| Ibrahim, Mostafa | SAMSUNG ELECTRONICS |
| IDO, Tetsuo | Canon |
| Inohiza, Hirohiko | Canon |
| Inoue, Yasuhiko | Nippon Telegraph and Telephone Corporation (NTT) |
| Jang, Insun | LG ELECTRONICS |
| Ji, Chenhe | Huawei Technologies Co. Ltd |
| Jia, Jia | Huawei Technologies Co., Ltd |
| Jiang, Jinjing | Apple Inc. |
| Jones, Allan | Activision |
| JOO, SEONG-SOON | Electronics and Telecommunications Research Institute (ETRI) |
| JUNG, MYUNG CHEUL | Pantech Inc. |
| Jungnickel, Volker | Fraunhofer Heinrich Hertz Institute |
| Kandala, Srinivas | SAMSUNG |
| Kedem, Oren | Huawei Technologies Co. Ltd |
| Khericha, samir | BRoadcom |
| Khorov, Evgeny | IITP RAS |
| Khude, Nilesh | NXP Semiconductors |
| Kim, Eunhee | Electronics and Telecommunications Research Institute (ETRI) |
| Kim, Jeongki | LG ELECTRONICS |
| Kim, Myeong-Jin | SAMSUNG |
| kim, namyeong | LG ELECTRONICS |
| Kim, Sanghyun | WILUS Inc |
| Kim, Yongho | Korea National University of Transportation |
| Kim, Youhan | Qualcomm Incorporated |
| Kim, Youn-Kwan | The Catholic University of Korea |
| Kishida, Akira | Nippon Telegraph and Telephone Corporation (NTT) |
| Klein, Arik | Huawei Technologies Co. Ltd |
| Klimakov, Andrey | Huawei Technologies Co., Ltd |
| Kneckt, Jarkko | Apple Inc. |
| Ko, Geonjung | WILUS Inc. |
| Kondo, Yoshihisa | Advanced Telecommunications Research Institute International (ATR) |
| Kumar, Manish | Marvell Semiconductor, Inc. |
| Kwak, Jin-Sam | WILUS Inc. |
| Kwon, Young Hoon | NXP Semiconductors |
| Lalam, Massinissa | SAGEMCOM BROADBAND SAS |
| Lan, Zhou | Broadcom Corporation |
| Lanante, Leonardo | Kyushu Institute of Technology |
| Lee, Il-Gu | Sungshin University |
| Lee, Jae Seung | Electronics and Telecommunications Research Institute (ETRI) |
| Lee, Kyeseon | ETRI |
| Lee, Wookbong | SAMSUNG |
| Le Houerou, Brice | Canon Research Centre France |
| Lepp, James | BlackBerry |
| Levitsky, Ilya | IITP RAS |
| Levy, Joseph | InterDigital, Inc. |
| Li, Guoqing | Apple Inc. |
| Li, Nan | ZTE Corporation |
| Li, Yiqing | Huawei Technologies Co. Ltd |
| Li, Yunbo | Huawei Technologies Co., Ltd |
| Liang, dandan | Huawei Technologies Co., Ltd |
| Lin, Wei | Huawei Technologies Co. Ltd |
| LIU, CHENCHEN | Huawei Technologies Co., Ltd |
| Liu, Der-Zheng | Realtek Semiconductor Corp. |
| Liu, Jeff | Broadcom Corporation |
| Liu, Yong | Apple Inc. |
| Loginov, Vyacheslav | IITP RAS |
| Lorgeoux, Mikael | Canon Research Centre France |
| Lou, Hanqing | InterDigital, Inc. |
| Lou, Hui-Ling | NXP Semiconductors |
| Lu, Liuming | ZTE Corporation |
| Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| Lv, kaiying | MediaTek Inc. |
| Ma, Mengyao | HUAWEI |
| Madpuwar, Girish | Broadcom Corporation |
| Mai, Huiheng | Blu Wireless Technology Ltd |
| Malinen, Jouni | Qualcomm Incorporated |
| Martinez Vazquez, Marcos | MaxLinear Corp |
| Max, Sebastian | Ericsson AB |
| McCann, Stephen | Self |
| Mcconnell, Ray | blu wireless technology |
| MELZER, Ezer | Toga Networks, a Huawei company |
| Memisoglu, Ebubekir | Vestal Company, Istanbul Medipol University; |
| Mirfakhraei, Khashayar | Cisco Systems, Inc. |
| Mohanty, Bibhu | Qualcomm Incorporated |
| Monajemi, Pooya | Cisco Systems, Inc. |
| Montemurro, Michael | Self |
| Montreuil, Leo | Broadcom Corporation |
| Murphy, Rick | vLogic, Inc. |
| Murti, Wisnu | SeoulTech |
| Nam, Junyoung | Qualcomm Incorporated |
| Namboodiri, Vamadevan | SAMSUNG ELECTRONICS |
| NANDAGOPALAN, SAI SHANKAR | Cypress Semiconductor Corporation |
| Naribole, Sharan | SAMSUNG |
| Nezou, Patrice | Canon Research Centre France |
| Nguyen, An | DHS/CISA |
| Nurani Krishnan, Neelakantan | Qualcomm Incorporated |
| Ohsawa, Tomoki | NICT |
| Omar, Hassan | Huawei Technologies Co.,  Ltd |
| Ouchi, Masatomo | Canon |
| Ozbakis, Basak | VESTEL |
| Palm, Stephen | Broadcom Corporation |
| Pan, Chun | HUAWEI |
| Park, Eunsung | LG ELECTRONICS |
| Park, Taejoon | Electronics and Telecommunications Research Institute (ETRI) |
| Patil, Abhishek | Qualcomm Incorporated |
| Patwardhan, Gaurav | Hewlett Packard Enterprise |
| Perahia, Eldad | Hewlett Packard Enterprise |
| Petranovich, James | ViaSat, Inc. |
| Petrick, Albert | InterDigital, Inc. |
| Petry, Brian | Broadcom Corporation |
| Pettersson, Charlie | Ericsson AB |
| porat, ron | Broadcom Corporation |
| Prabhakaran, Dinakar | Broadcom Corporation |
| Puducheri, Srinath | Broadcom Corporation |
| QIU, WEI | Huawei Technologies Co., Ltd |
| Rai, Kapil | Qualcomm Incorporated |
| Raissinia, Alireza | Qualcomm Incorporated |
| Redlich, Oded | HUAWEI |
| Regev, Dror | Toga Networks (a Huawei Company) |
| REICH, MOR | Togan Networks, a Huawei Company |
| Rezk, Meriam | Qualcomm Incorporated |
| Riegel, Maximilian | Nokia |
| Rosdahl, Jon | Qualcomm Technologies, Inc. |
| Roy, Sayak | NXP Semiconductors |
| Sakoda, Kazuyuki | Sony Corporation |
| Salem, Mohamed | Huawei Technologies Co., Ltd |
| Salman, Hanadi | Vestal Company, Istanbul Medipol University; |
| Sandhu, Shivraj | Qualcomm Incorporated |
| Schiessl, Sebastian | u-blox |
| Scott, Andy | NCTA - The Internet & Television Association |
| Sedin, Jonas | Ericsson AB |
| Seok, Yongho | MediaTek Inc. |
| Sethi, Ankit | NXP Semiconductors |
| Sevin, Julien | Canon Research Centre France |
| Shilo, Shimi | HUAWEI |
| Sinn, Ulrich | Siemens AG |
| Siyari, Peyman | Qualcomm Incorporated |
| Smith, Graham | SR Technologies |
| Solaija, Muhammad Sohaib | Vestal Company, Istanbul Medipol University; |
| Son, Ju-Hyung | WILUS Inc. |
| Song, Taewon | LG ELECTRONICS |
| Srinivasa, Sudhir | NXP Semiconductors |
| Stacey, Robert | Intel Corporation |
| Stahl Diskin, Nir | Broadcom Corporation |
| Startsev, Ivan | IITP RAS |
| Stott, Noel | Keysight Technologies |
| Su, Hang | Broadcom Corporation |
| SUH, JUNG HOON | Huawei Technologies Co. Ltd |
| Sun, Li-Hsiang | InterDigital, Inc. |
| Sun, Sheng | Huawei Technologies Co., Ltd |
| Sun, Yanjun | Qualcomm Incorporated |
| Tanaka, Yusuke | Sony Corporation |
| Tomoyuki, Takada | Canon |
| Torab Jahromi, Payam | Facebook |
| Tsodik, Genadiy | Huawei Technologies Co. Ltd |
| Uln, Kiran | Cypress Semiconductor Corporation |
| Umehara, Makoto | Canon |
| Urabe, Yoshio | Panasonic Corporation |
| van Wageningen, Andries | Signify |
| Van Zelst, Allert | Qualcomm Incorporated |
| Verenzuela, Daniel | Sony Corporation |
| Verma, Lochan | Qualcomm Incorporated |
| Verma, Sindhu | Broadcom Corporation |
| VIGER, Pascal | Canon Research Centre France |
| Wang, Chao Chun | MediaTek Inc. |
| Wang, Hao | Tencent |
| Wang, Huizhao | Quantenna Communications, Inc. |
| Wang, Lei | Huawei R&D USA |
| Wang, Qi | Apple Inc. |
| Wentink, Menzo | Qualcomm |
| Wu, Kanke | Qualcomm Incorporated |
| Wu, Tianyu | Apple Inc. |
| Wullert, John | Perspecta Labs |
| Xia, Qing | Sony Corporation |
| Xin, Liangxiao | Sony Corporation |
| Xin, Yan | Huawei Technologies Co., Ltd |
| Xue, Ruifeng | Cisco Systems, Inc. |
| Yan, Aiguo | Oppo |
| Yan, Zhongjiang | Northwestern Polytechnical University |
| Yang, Bo | Huawei Technologies Co. Ltd |
| Yang, Jay | Nokia |
| Yang, Lin | Qualcomm Incorporated |
| Yang, Mao | Northwestern Polytechnical University |
| Yang, Steve TS | MediaTek Inc. |
| Yang, Yunsong | Futurewei Technologies |
| Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| Yee, James | MediaTek Inc. |
| yi, yongjiang | Futurewei Technologies |
| Yona, Yair | Qualcomm Incorporated |
| Yong, Su Khiong | Apple Inc. |
| Yoshikawa, Yuki | Canon |
| Young, Christopher | Broadcom Corporation |
| Yu, Heejung | Korea University |
| Yu, Jian | Huawei Technologies Co., Ltd |
| Yu, Mao | NXP Semiconductors |
| Yukawa, Mitsuyoshi | Canon, Inc. |
| Zhang, John | GuangDong OPPO Mobile Telecommunications Corp., Ltd. |
| Zhang, Yan | NXP Semiconductors |
| Zhou, Yifan | Huawei Technologies Co., Ltd |
| Zou, Tristan | Qualcomm Incorporated |
| Zuo, Xin | Tencent |

The Chair reminds that the agenda can be found in 11-20/927r8. The agenda is modified slightly and approved.

**Submissions**

* 1. [883r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0883-00-00be-multi-link-spatial-multiplexing.pptx) Multi-link Spatial Multiplexing (Yongho Seok) [Q&A and SP]

Discussion:

C: I support this. I have the similar contribution. Could you defer the SP?

A: Yes

C: In example 2, different maximum streams number per different link is not normal case. Any reason why you consider?

A: I received comments. Wants to generalize the use case.

C: I see. But not clear still.

* SP 1 of 883r1: **Do you support the multi-link operation for a non-AP MLD that is defined as follows for R1?**
  + An MLD that can: 1) transmit or receive data/management frames to another MLD on one link at a time, and 2) listening on one or more links.
    - The “listening” operation includes CCA as well as receiving initial control messages (e.g., RTS/MU-RTS)
    - The initial control message may have one or more additional limitations: spatial stream, MCS (data rate), PPDU type, frame type
    - Link switch delay may be indicated by the non-AP MLD
  + The MLD may support concurrent transmission/reception or not support.

C: SP text is unclear.

A: Any suggestion?

C: The second part can be removed.

C: The last bullet is confict with the first listening part.

A: Fine. Fine to remove second part?

C: Had better defer this SP.

SP is defered

* 1. [900r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0900-00-00be-nstr-mld-operation.pptx) NSTR MLD operation (Young Hoon Kwon)

Discussion:

C: Your protocols seems a symetric protocol. Dynamically change. More flexiblity.

A: This example is downlink. TXOP owner is AP MLD.

C: static is default mode? Operating mode indication is very straightforward.

A: But in static eSR mode, although both links are clear, they cannot use both links.

C: on the dynamic operation, this is happening on the TXOP. The gain will be .... Once that’s busy and is then clear, after that, you’ll be and get in the gain. Just considering the length of the TXOP, have you ... how much gain will be obtain.

A: Now, i don’t have number of the gain.

* 1. [908r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0908-00-00be-multilink-ts-operation.pptx) Multilink TS Operation (Harry Wang)

Discussion:

A: Non-AP STA side has more information and non-AP MLD may not have full information just have data information

C: SP2 in slide 15, why do you use only TID 8~15 for this purpose in TSPEC?

A: other contribution mentioned more than 8 TID is used for other purpose. 8~15 can be included for other mechansim.

C: TSPEC is STA level as Duncun mentioned. Not MLD level.

C: I have similar presentation. I think they are aligned. We need to think about the signaling level. I agree with the high level concept.

C: Instead 8~15, suggestion is to use > 7.

The teleconference was adjourned at 12:00 EDT