IEEE P802.11  
Wireless LANs

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| TGbe 2020 May to July teleconference minutes | | | | |
| Date: 2020-05-15 | | | | |
| Author(s): | | | | |
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|  |  |  |  |  |

Abstract

This document contains the minutes for May to July 2020 TGbe teleconferences.

Revisions:

* Rev 0: Added references to telephone conferences held 4th-11th of May. Added minutes for telephone conference 14th of May.
* Rev 1: Some minor updates to telco 14th of May. Added references to conferences held XX-YY. Added minutes for telephone conference 28th of May.

# Contents

[Monday 4 May 2020, 10:00-13:00 ET 3](#_Toc40432644)

[Thursday 7 May 2020, 19:00-22:00 ET 3](#_Toc40432645)

[Friday 8 May 2020, 10:00-13:00 ET 3](#_Toc40432646)

[Monday 11 May 2020, 19:00 – 22:00 ET 3](#_Toc40432647)

[Thursday 14 May 2020, 10:00 – 13:00 ET 4](#_Toc40432648)

# Monday 4 May 2020, 10:00-13:00 ET

Only MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0511-13-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-march-and-may-2020.docx>

# Thursday 7 May 2020, 19:00-22:00 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0511-13-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-march-and-may-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0587-06-00be-minutes-april-phy-cc.docx>

# Friday 8 May 2020, 10:00-13:00 ET

Only MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0511-13-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-march-and-may-2020.docx>

# Monday 11 May 2020, 19:00 – 22:00 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0748-00-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-in-march-and-may-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0708-02-00be-minutes-for-tgbe-phy-ad-hoc-cc-march-to-may-2020.docx>

# Thursday 14 May 2020, 10:00 – 13:00 ET

**Introduction**

1. The Chair, Alfred Asterjadhi (Qualcomm) calls the meeting to order at 10:02AM. The agenda can be found [11-20/0735r4](https://mentor.ieee.org/802.11/dcn/20/11-20-0735-04-00be-may-july-tgbe-teleconference-agendas.docx).
2. IEEE 802 and 802.11 IPR policy and procedure. 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 please speak up now. Nobody speaks up.
3. Attendance reminder.
   1. Participation slide: <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180-05-00EC-ieee-802-participation-slide.pptx>
   2. 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.
   3. If you are unable to record the attendance via [IMAT](https://imat.ieee.org/attendance) then please send an e-mail to Dennis Sundman ([dennis.sundman@ericsson.com](mailto:dennis.sundman@ericsson.com)) and Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
   4. Please ensure that the following information is listed correctly when joining the call:
      1. "[voter status] First Name Last Name (Affiliation)"
   5. List of attendees:
   * Aboulmagd, Osama Huawei Technologies Co., Ltd
   * Adhikari, Shubhodeep Broadcom Corporation
   * Aio, Kosuke Sony Corporation
   * Ansley, Carol CommScope
   * Asterjadhi, Alfred Qualcomm Incorporated
   * Au, Kwok Shum Huawei Technologies Co., Ltd
   * Awater, Geert Qualcomm Incorporated
   * baron, stephane Canon Research Centre France
   * Bredewoud, Albert Broadcom Corporation
   * Cao, Rui NXP Semiconductors
   * Carney, William Sony Corporation
   * Cavalcanti, Dave Intel Corporation
   * CHAN, YEE Facebook
   * Chen, Cheng Intel Corporation
   * Chen, Xiaogang Intel
   * Cheng, Paul MediaTek
   * CHERIAN, GEORGE Qualcomm Incorporated
   * Chitrakar, Rojan Panasonic Asia Pacific Pte Ltd.
   * Choi, Jinsoo LG ELECTRONICS
   * CHUN, JINYOUNG LG ELECTRONICS
   * Ciochina, Dana Sony Corporation
   * Coffey, John Realtek Semiconductor Corp.
   * Das, Subir Perspecta Labs Inc.
   * de Vegt, Rolf Qualcomm Incorporated
   * Duan, Ruchen SAMSUNG
   * ElSherif, Ahmed Qualcomm Incorporated
   * Erceg, Vinko Broadcom Corporation
   * Fang, Yonggang ZTE TX Inc
   * Fischer, Matthew Broadcom Corporation
   * Galati Giordano, Lorenzo Nokia
   * Gan, Ming Huawei Technologies Co., Ltd
   * Guo, Qiang InfomTechnologies
   * Guo, Yuchen Huawei Technologies Co., Ltd
   * Han, Jonghun SAMSUNG
   * Han, Zhiqiang ZTE Corporation
   * Handte, Thomas Sony Corporation
   * Hervieu, Lili Cable Television Laboratories Inc. (CableLabs)
   * 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.
   * Jang, Insun LG ELECTRONICS
   * Ji, Chenhe Huawei Technologies Co. Ltd
   * Jiang, Jinjing Apple, Inc.
   * Kakani, Naveen Qualcomm Incorporated
   * Kandala, Srinivas SAMSUNG
   * Kasher, Assaf Qualcomm Incorporated
   * Kedem, Oren Huawei Technologies Co. Ltd
   * Kim, Myeong-Jin SAMSUNG
   * Kim, Sang Gook LG ELECTRONICS
   * Kim, Sanghyun WILUS Inc
   * Kishida, Akira Nippon Telegraph and Telephone Corporation (NTT)
   * Kneckt, Jarkko Apple, Inc.
   * Ko, Geonjung WILUS Inc.
   * Kondo, Yoshihisa Advanced Telecommunications Research Institute International (ATR)
   * Kumar, Manish Marvell Semiconductor, Inc.
   * Kwon, Young Hoon NXP Semiconductors
   * Lalam, Massinissa SAGEMCOM BROADBAND SAS
   * Lee, Wookbong SAMSUNG
   * Levitsky, Ilya IITP RAS
   * Li, Yiqing Huawei Technologies Co. Ltd
   * Li, Yunbo Huawei Technologies Co., Ltd
   * Lim, Dong Guk LG ELECTRONICS
   * LIU, CHENCHEN Huawei Technologies Co., Ltd
   * Liu, Yong Apple, Inc.
   * Lopez, Miguel Ericsson AB
   * Lou, Hanqing InterDigital, Inc.
   * Lu, Liuming ZTE Corporation
   * Lv, kaiying MediaTek Inc.
   * Lv, Lily Huawei Technologies Co. Ltd
   * Max, Sebastian Ericsson AB
   * Memisoglu, Ebubekir IMU
   * Mirfakhraei, Khashayar Cisco Systems, Inc.
   * Monajemi, Pooya Cisco Systems, Inc.
   * Montreuil, Leo Broadcom Corporation
   * NANDAGOPALAN, SAI SHANKAR Cypress Semiconductor Corporation
   * Nezou, Patrice Canon Research Centre France
   * noh, yujin Newracom Inc.
   * Ouchi, Masatomo Canon
   * Pare, Thomas MediaTek Inc.
   * Park, Eunsung LG ELECTRONICS
   * Park, Minyoung Intel Corporation
   * Park, Sung-jin LG ELECTRONICS
   * Patil, Abhishek Qualcomm Incorporated
   * Patwardhan, Gaurav Hewlett Packard Enterprise
   * PESIN, ANTHONY InterDigital, Inc.
   * Pettersson, Charlie Ericsson AB
   * porat, ron Broadcom Corporation
   * Puducheri, Srinath Broadcom Corporation
   * Redlich, Oded Huawei
   * RISON, Mark Samsung Cambridge Solution Centre
   * Rosdahl, Jon Qualcomm Technologies, Inc.
   * Salman, Hanadi Istanbul Medipol University
   * Schelstraete, Sigurd Quantenna Communications, Inc.
   * Shellhammer, Stephen Qualcomm Incorporated
   * Shilo, Shimi HUAWEI
   * Solaija, Muhammad Sohaib Istanbul Medipol University; Vestel
   * Son, Ju-Hyung WILUS Inc.
   * Song, Taewon LG ELECTRONICS
   * Stacey, Robert Intel Corporation
   * Strauch, Paul Qualcomm Incorporated
   * SUH, JUNG HOON Huawei Technologies Co. Ltd
   * Sun, Bo ZTE Corporation
   * Sun, Li-Hsiang InterDigital, Inc.
   * Sun, Yanjun Qualcomm Incorporated
   * Sundman, Dennis Ericsson AB
   * Tian, Bin Qualcomm Incorporated
   * Torab Jahromi, Payam Facebook
   * Tsodik, Genadiy Huawei Technologies Co. Ltd
   * Turkmen, Halise Vestel
   * Van Zelst, Allert Qualcomm Incorporated
   * Varshney, Prabodh Nokia
   * VIGER, Pascal Canon Research Centre France
   * Wang, Hao Tencent
   * Wang, Lei Huawei R&D USA
   * Wang, Qi Apple, Inc.
   * Wang, Xiaofei InterDigital, Inc.
   * Ward, Lisa Rohde & Schwarz
   * Wentink, Menzo Qualcomm
   * Xin, Yan Huawei Technologies Co., Ltd
   * Yan, Aiguo Oppo
   * Yang, Jay Nokia
   * YANG, RUI InterDigital, Inc.
   * Yang, Steve TS MediaTek Inc.
   * Yano, Kazuto Advanced Telecommunications Research Institute International (ATR)
   * Yee, James MediaTek Inc.
   * yi, yongjiang Futurewei Technologies
   * Young, Christopher Broadcom Corporation
   * Yu, Jian Huawei Technologies Co., Ltd
   * Yu, Mao NXP Semiconductors
   * Zhang, Yan NXP Semiconductors
   * Zhou, Yifan Huawei Technologies Co., Ltd
4. Announcements:
   1. The Chair announces that there are new rules on page 36 in 11-20/0735r4, to be discussed in the next item, TGbe procedure.
5. TGbe Procedure:
   1. Follow up on re-scheduling a subset of new teleconference calls for MAC ad-hoc.
      1. MAC SP result was: 31Y, 13N, 15A.
      2. Discussion on new meeting times for the MAC ad-hoc:

C: Two voices heard that believe it is unfair that no meeting times are good for Europe.

C: Some meetings are such that there is little/no time inbeteen to do any work.

C: Discussion back and forth about pros and cons with different times.

**Straw poll 1:** Option1: Keep current schedule 10 AM WED

Y/N/A/No-answer: 64/40/20/39

**Straw poll 2:** Option2: Alternate between 10 AM and 19:00 on WED – see [11-20/0735r4](https://mentor.ieee.org/802.11/dcn/20/11-20-0735-04-00be-may-july-tgbe-teleconference-agendas.docx)

Y/N/A/No-answer: 57/36/25/42

**Straw poll 3:** Option3: Do you prefer moving the schedule for the new MAC ad hoc conference calls (10 AM Friday)  
Y/N/A/No-answer: 45/57/27/33

**Straw poll 4:** Option4: Do you prefer moving the schedule for the new MAC ad hoc conference calls (9 AM Wednesday)

Y/N/A/No-answer: 59/48/14/41

**Straw poll 5:** Option5: Do you prefer moving the schedule for the new Mac ad hoc conference calls (1 AM Wednesday)

Y/N/A/No-answer: 41/56/15/51

Option1 is the most popular option.

* 1. Update to the Guideline-Building Consensus and Populating the TGbe SFD.

Alfred goes through the changes in [11-20/0735r4](https://mentor.ieee.org/802.11/dcn/20/11-20-0735-04-00be-may-july-tgbe-teleconference-agendas.docx).

**Discussion:**

C: Is this going to be a separate or is it part of the joint session?

A: The proposal is to move the joint sessions.

C: Only existing voting members are allowed to vote?

A: Yes.

C: I would like the WG chair to consider how to change this.

C: What do we do if the compendium on motions marked in green fails.

A: If this happens I will ask the group where the concerns are.  
C: Some of the green text is in question form. I cannot put that into the SFD.  
A: I consider that as editorial. It should be rather straight forward to modify it so that it can go into the SFD. The editor (Edward Au) can do this.

Nobody objects to keep the joint meetings at 10:00 AM.

1. Is there any objection to continue with the submissions as per the agenda below? Nobody objects.
   1. Technical Submissions**-Multi RU**:
      1. [413r1](https://mentor.ieee.org/802.11/dcn/20/11-20-0413-01-00be-discussion-on-eht-trigger-based-ul-mu.pptx) Discussion on EHT Trigger based UL MU (Insun Jang)
      2. [416r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0416-00-00be-mru-signaling-in-trigger-frame.pptx) Mru-signaling-in-trigger-frame (Ross Jian Yu)
   2. Technical Submissions**-HARQ**:
      1. [466r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0466-00-00be-harq-feedback.pptx) HARQ feedback (Li-Hsiang Sun)
      2. [481r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0481-00-00be-impact-of-harq-on-latency-system-level-simulation-analysis.pptx) Impact of HARQ on Latency-System Level Simulation Analysis (Shimi Shilo)
      3. [482r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0482-00-00be-discussion-on-harq-unit.pptx) Discussion on HARQ Unit (Shimi Shilo)
   3. Technical Submissions**-MAP TDMA**:
      1. 574r0 C-TDMA definition (Laurent Cariou)
      2. 595r0 C-TDMA protection (Dibakar Das)
   4. Technical Submissions**-MAP General**:
      1. [560r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0560-00-00be-multi-ap-configuration-and-resource-allocation.pptx) Multi-AP Configuration and Resource Allocation (Po-Kai Huang)
      2. [596r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0596-00-00be-ap-candidate-set-follow-up.pptx) AP candidate set follow up (Cheng Chen)
      3. [617r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0617-00-00be-multi-ap-operation-basic-definition.pptx) Multi-AP-Operation-Basic-Definition (Oren Kedem)
   5. Technical Submissions**-Low Lat**:
      1. [005r1](https://mentor.ieee.org/802.11/dcn/20/11-20-0005-01-00be-proposals-on-latency-reduction.pptx) Proposals on Latency Reduction (Shubhodeep Adhikari)
   6. Technical Submissions**-MAP-MU MIMO**:
      1. 548r0 Discussion On Coordinated UL MU-MIMO (Genadiy Tsodik)
   7. Technical Submissions**-General**:
      1. [674r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0674-00-00be-forward-compatible-ofdma.pptx) Forward compatible OFDMA (Xiaogang Chen)
   8. Technical Submissions**-MAP-SR**:
      1. [576r1](https://mentor.ieee.org/802.11/dcn/20/11-20-0576-01-00be-coordinated-spatial-reuse-protocol.pptx) Coordinated Spatial Reuse Protocol (Yongho Seok)
      2. [590r0](https://mentor.ieee.org/802.11/dcn/20/11-20-0590-00-00be-shared-txop-spatial-reuse-considerations.pptx) Shared TXOP Spatial Reuse Considerations (Jonghun Han)

**Technical contributions**

1. [**413r1**](https://mentor.ieee.org/802.11/dcn/20/11-20-0413-01-00be-discussion-on-eht-trigger-based-ul-mu.pptx) **Discussion on EHT Trigger based UL MU (Insun Jang)**

**Summary:** The authors look at Trigger based UL MU using 240/320 MHz and Multi-RU aggregation. In particular they consider what information fields need to be updated.

**Discussion:**

C: Slide 3, do you assume that you can signal single link with multiple links?

A: For now I don’t consider multi-link.

C: Slide 4, for the user field, do you have enough bits?

A: I think so.

C: Option 2, slide 8, where does AP obtain STA data? To support option 2 I need some additional information.

C: Is there a typo in SP 1, it should be 3 bits right? Furthermore I am preparing a contribution for this. Can you defer your SP until I have presented?

A: Sure.

C: The 240 Mhz is a punctured 320 so that should not be needed to signal. We need to think about forward and backward compatibility.

A: Yes.

C: Slide 8, I prefer option 2. Can you defer the strawpoll?

Straw poll deferred.

1. [**416r0**](https://mentor.ieee.org/802.11/dcn/20/11-20-0416-00-00be-mru-signaling-in-trigger-frame.pptx) **Mru-signaling-in-trigger-frame (Ross Jian Yu)**

**Summary:** The authors propose 3 options for multi-RU indication.

**Discussion:**

C: I believe your option 3 is the best one.

A: Ok.

C: I agree with the previous commentor.

A: Ok.

C: Can you defer SP1 since I have a presentation that is related. I believe you can run SP2 to gather information.

A: Ok I will defer.

C: Are you proposing to use 1 reserved bit in the existing frame?  
A: We are open to it.

**Straw poll 2:**

Which option do you prefer to be used for RU combination indication in the trigger frame+ Non-ofdma mode TBD

A: Option 1, Repeat AID in the User Info field allocated to the same STA

B: Option 2, combination indication in each user info field

C: Abstain

D: Need more discussion

E: Option 3: Change in the RU Allocation subfield

**Result:**

A/B/C/D/E: 14/21/22/41/30/40

1. [**466r0**](https://mentor.ieee.org/802.11/dcn/20/11-20-0466-00-00be-harq-feedback.pptx) **HARQ feedback (Li-Hsiang Sun)**

**Summary:** The authors look at possible ways to determine whether HARQ unit LLRs are buffered.

**Discussion:**

C: On slide 6, In general I consider an MPDU to contain multiple CWs.

A: Here we assume a “CW” is a number of codewords.

C: On slide 4, you mention that it may be hard for the originator to conclude whether a particular HARQ unit is buffered. What do you mean with this?

A: Between transmissions it is hard for the originator to know how many units were buffered.

1. [**481r0**](https://mentor.ieee.org/802.11/dcn/20/11-20-0481-00-00be-impact-of-harq-on-latency-system-level-simulation-analysis.pptx) **Impact of HARQ on Latency-System Level Simulation Analysis (Shimi Shilo)**

**Summary:** The authors present simulation results for HARQ focusing on latency. The simulations are carried out in NS-3 simulator.

**Discussion:**

C: Which system, .11ac, .11ax, etc?

A: I think it is

C: What BW did you run?  
A: I believe 20 MHz

C: How many spatial streams?

A: 2.

C: I would suggest to perform simulations where you sweep different operating points.

A: We did perform many more simulations, not presented here. The results were pretty consistent.

C: There are clearly many retransmissions (due to the large latency). I believe this largely benefits HARQ compared to ARQ. I try to understand how realistic these gains are in practice.

A: Naturally this is a simplified scenario.

C: Whats the target PER for the first transmission? I would expect that ARQ should be better than HARQ in some cases.

A: We didn’t modify Minstrel at all. The same Minstrel for ARQ and HARQ.

1. **Adjourn at 13:00.**

# Monday 18 May 2020, 10:00 – 13:00 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-03-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-01-00be-minutes-802-11-be-phy-ad-hoc-telephone-conferences-may-july-2020.docx>

# Wednesday 20 May 2020, 10:00 – 13:00 ET

Only MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-03-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>

# Thursday 21 May 2020, 19:00 – 22:00 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-03-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-01-00be-minutes-802-11-be-phy-ad-hoc-telephone-conferences-may-july-2020.docx>

# Wednesday 27May 2020, 10:00 – 13:00 ET

Only MAC.

* MAC: Currently N/A.

# Thursday 28 May 2020, 10:00 – 13:00 ET

**Introduction**

1. The Chair (Alfred Asterjadhi) calls the meeting to order at 10:02. The agenda can be found [11-20/0735r13](https://mentor.ieee.org/802.11/dcn/20/11-20-0735-13-00be-may-july-tgbe-teleconference-agendas.docx)
2. IEEE 802 and 802.11 IPR policy and procedure. 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 please speak up now. Nobody speaks up.
3. 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 “802.11 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 Dennis Sundman ([dennis.sundman@ericsson.com](mailto:dennis.sundman@ericsson.com)) and Alfred Asterjadhi ([aasterja@qti.qualcomm.com](mailto:aasterja@qti.qualcomm.com))
   * Please ensure that the following information is listed correctly when joining the call:
     + "[voter status] First Name Last Name (Affiliation)"
   * List of attendees:
     + Aboulmagd, Osama Huawei Technologies Co., Ltd
     + Adhikari, Shubhodeep Broadcom Corporation
     + Aio, Kosuke Sony Corporation
     + An, Song-Haur INDEPENDENT
     + Asterjadhi, Alfred Qualcomm Incorporated
     + Au, Kwok Shum Huawei Technologies Co., Ltd
     + baron, stephane Canon Research Centre France
     + Bei, Jianwei NXP Semiconductors
     + Bredewoud, Albert Broadcom Corporation
     + Cao, Rui NXP Semiconductors
     + Carney, William Sony Corporation
     + CHAN, YEE Facebook
     + Chen, Xiaogang Intel
     + Cheng, Paul MediaTek Inc.
     + CHERIAN, GEORGE Qualcomm Incorporated
     + Chitrakar, Rojan Panasonic Asia Pacific Pte Ltd.
     + Choi, Jinsoo LG ELECTRONICS
     + CHUN, JINYOUNG LG ELECTRONICS
     + Das, Subir Perspecta Labs Inc.
     + Derham, Thomas Broadcom Corporation
     + de Vegt, Rolf Qualcomm Incorporated
     + Ding, Baokun Huawei Technologies Co. Ltd
     + Dong, Xiandong Xiaomi Inc.
     + Doostnejad, Roya Intel Corporation
     + ElSherif, Ahmed Qualcomm Incorporated
     + Erceg, Vinko Broadcom Corporation
     + Fischer, Matthew Broadcom Corporation
     + Galati Giordano, Lorenzo Nokia
     + Ghosh, Chittabrata Intel Corporation
     + Guo, Qiang InfomTechnologies
     + Guo, Yuchen Huawei Technologies Co., Ltd
     + Han, Jonghun SAMSUNG
     + Han, Zhiqiang ZTE Corporation
     + Handte, Thomas Sony Corporation
     + Ho, Duncan Qualcomm Incorporated
     + Hong, Hanseul Yonsei University
     + Hsieh, Hung-Tao MediaTek Inc.
     + Hsu, Chien-Fang MediaTek Inc.
     + Hu, Chunyu Facebook
     + Hu, Mengshi HUAWEI
     + Huang, Guogang Huawei
     + Huang, Lei Panasonic Asia Pacific Pte Ltd.
     + Huang, Po-Kai Intel Corporation
     + Hwang, Sung Hyun Electronics and Telecommunications Research Institute (ETRI)
     + Inohiza, Hirohiko Canon Inc.
     + Inoue, Yasuhiko Nippon Telegraph and Telephone Corporation (NTT)
     + Ji, Chenhe Huawei Technologies Co. Ltd
     + Jiang, Jinjing Apple, Inc.
     + Kakani, Naveen Qualcomm Incorporated
     + Kedem, Oren Huawei Technologies Co. Ltd
     + Kim, Jeongki LG ELECTRONICS
     + kim, namyeong LG ELECTRONICS
     + Kim, Sanghyun WILUS Inc
     + Kim, Yongho Korea National University of Transportation
     + Kim, Youhan Qualcomm Incorporated
     + Kishida, Akira Nippon Telegraph and Telephone Corporation (NTT)
     + Kneckt, Jarkko Apple, Inc.
     + Ko, Geonjung WILUS Inc.
     + Kondo, Yoshihisa Advanced Telecommunications Research Institute International (ATR)
     + Kwon, Young Hoon NXP Semiconductors
     + Lalam, Massinissa SAGEMCOM BROADBAND SAS
     + Lee, Wookbong SAMSUNG
     + Levy, Joseph InterDigital, Inc.
     + Li, Qinghua Intel Corporation
     + Li, Yiqing Huawei Technologies Co. Ltd
     + Li, Yunbo Huawei Technologies Co., Ltd
     + Lim, Dong Guk LG ELECTRONICS
     + LIU, CHENCHEN Huawei Technologies Co., Ltd
     + Liu, Jianhan MediaTek Inc.
     + Liu, Yong Apple, Inc.
     + Lopez, Miguel Ericsson AB
     + Lou, Hanqing InterDigital, Inc.
     + Lu, Liuming ZTE Corporation
     + Lv, kaiying MediaTek Inc.
     + Lv, Lily Huawei Technologies Co. Ltd
     + Max, Sebastian Ericsson AB
     + Mirfakhraei, Khashayar Cisco Systems, Inc.
     + NANDAGOPALAN, SAI SHANKAR Cypress Semiconductor Corporation
     + Naribole, Sharan SAMSUNG
     + Pan, Chun HUAWEI
     + Park, Eunsung LG ELECTRONICS
     + Park, Minyoung Intel Corporation
     + Park, Sung-jin LG ELECTRONICS
     + Patil, Abhishek Qualcomm Incorporated
     + Patwardhan, Gaurav Hewlett Packard Enterprise
     + Petrick, Albert InterDigital, Inc.
     + Pettersson, Charlie Ericsson AB
     + Puducheri, Srinath Broadcom Corporation
     + Pulikkoonattu, Rethnakaran Broadcom Corporation
     + Raissinia, Alireza Qualcomm Incorporated
     + RISON, Mark Samsung Cambridge Solution Centre
     + Rosdahl, Jon Qualcomm Technologies, Inc.
     + Schelstraete, Sigurd Quantenna Communications, Inc.
     + Sedin, Jonas Ericsson AB
     + Seok, Yongho MediaTek Inc.
     + Shellhammer, Stephen Qualcomm Incorporated
     + Shilo, Shimi HUAWEI
     + Solaija, Muhammad Sohaib Istanbul Medipol University; Vestel
     + Song, Taewon LG ELECTRONICS
     + Strauch, Paul Qualcomm Incorporated
     + SUH, JUNG HOON Huawei Technologies Co. Ltd
     + Sun, Li-Hsiang InterDigital, Inc.
     + Sun, Yanjun Qualcomm Incorporated
     + Tanaka, Yusuke Sony Corporation
     + Tian, Bin Qualcomm Incorporated
     + Tsodik, Genadiy Huawei Technologies Co. Ltd
     + Turkmen, Halise Vestel
     + Uln, Kiran Cypress Semiconductor Corporation
     + Verma, Sindhu Broadcom Corporation
     + Vermani, Sameer Qualcomm Incorporated
     + Wang, Hao Tencent
     + Wang, Lei Huawei R&D USA
     + Wilhelmsson, Leif Ericsson AB
     + Xin, Yan Huawei Technologies Co., Ltd
     + Yan, Aiguo Oppo
     + Yang, Jay Nokia
     + Yang, Steve TS MediaTek Inc.
     + Yano, Kazuto Advanced Telecommunications Research Institute International (ATR)
     + Yee, James MediaTek Inc.
     + yi, yongjiang Futurewei Technologies
     + Yin, Yue HUAWEI
     + Young, Christopher Broadcom Corporation
     + Yu, Jian Huawei Technologies Co., Ltd
     + Yu, Mao NXP Semiconductors
     + Yuan, Fangchao HUAWEI
     + Zhang, Yan NXP Semiconductors
     + Zuo, Xin Tencent
4. The Chair asks if there is any objection to approve the agenda. No objection.  
   Discussion: I believe the telco progress is working very smoothly. Thanks to all leadership and participants to make it work so well.
5. Announcements:
   * Motions scheduled during the first half of Joint Conf Call of June 11th. Preliminary list as follows:
     + Motions to approve minutes since (and including) the January F2F meeting.
     + One motion covering all SFD text contributions in 11-20/566r25\* that are highlighted in green. Each SFD text contribution will be identified by their respective SP tag ***[#SPX]****, where X is the SP ID.*
       - These have passed confirmatory SPs in a previous Joint Conf call.
     + One motion covering all SFD text contributions in 11-20/566r25\* that are highlighted in yellow and did not receive a request for further discussion. Each SFD text contribution will be identified by their respective SP tag ***[#SPX]****, where X is the SP ID.*
     + Separate motions covering each SFD text contributions in 11-20/566r25\* that are highlighted in yellow and did receive a request for further discussion (request received since the respective announcement and up to 4 hours before the scheduled Joint Conf call where motions are scheduled).

**Discussion:**

C: Is there any chance of discussion for the green ones?

A: The intention is that it is not needed.

* + Dragon Boat Festival on June 25th 2020:
    - Consider moving 25th June Joint Call to July 3rd 2020 (overlaps with TGbd and TGmd

**Discussion:**

C: Can we move the one on June 24th.

C: I would consider just cancelling the 25th call. I object to that move.

* Cancel both calls June 24th and 25th and find alternative schedules which will be discussed in the next joint call. Nobody objects. Calls cancelled.

**Submissions**

1. [**115r5**](https://mentor.ieee.org/802.11/dcn/20/11-20-0115-05-00be-multi-link-feature-candidates-for-r1.pptx)**, “Multilink Feature Candidates For Release 1”, Huizhao Wang (Quantenna)**

**Summary:** The authors list which features they believe should be included in release 1. They are very specific in the multi-link details.

**Discussion:**

C: You mention single radio. We have no clear idea what a single radio device. What is an enhanced single radio?

A: I agree these things are not clear.

C: I think we should have a separate SP on what a single radio device is.

A: Ok.

C: You mentioned 4 categories for R1: single radio, enhanced single radio, STR multi-radio and non-STR multi-radio, which is what we want. We have so much struggle with the non-STR radio.

C: I don’t think we should limit at this stage. We need more information.

More comments along the lines that it’s too early for this straw poll.

C: Maybe we can split this slide into two parts to separate out things we agree on.

C: Can you cross out the “Define a TID to link mapping mechanism…”

A: Ok.

C: I think we should defer this SP.

C: I think we should run this SP.

**SP Deferred.**

1. [**687r0**](https://mentor.ieee.org/802.11/dcn/20/11-20-0687-00-00be-r1-r2-discussion-for-ap-coordination.pptx)**, “R1-R2 discussion for AP coordination”, Laurent Cariou (Intel)**

**Summary:** The authors would like to move the low complexity AP coordination from R1 to R2.

**Discussion:**

C: Slide 6. In the last subbullet you have additional multi-AP features. Therefore, the “Additional multi-AP features” should read “Multi AP-features”. Second question, what about if something in R1 prohibits things in R2.

A: Yes, and for the second question, we should make sure this does not happen.

C: I don’t agree that there is no consensus on low complexity AP coordination. I believe it should be part of R1.

A: I don’t believe there is only one feature that we have agreed on.

C: I don’t agree with moving the simple AP coordination to R2. At the same time I agree with you it’s unclear what it is. But this is part of the discussion to lead up to the feature. Considering the timeline I believe too much things will be left for R2.

C: To what extent should we work on R1/R2? Because the risk is that we end up with having to do a complete redesign of our chips to enable R2 if we didn’t consider that in R1.

A: I agree we need to consider R2 also.

C: Is your intention to spend a lot of time on multi-AP features in R2?

A: Yes certainly this will be important.

C: I agree with this SP.

**SP:**

Do you agree to remove “a low complexity AP coordination feature” from Release 1 features and to change “16 spatial streams, HARQ, Additional multi-AP features (e.g. C-BF, JT), any other potential features in the scope of PAR (e.g. features for Time-sensitive networks)” to “16 spatial streams, HARQ, multi-AP features (e.g. C-BF, JT, C-OFDMA/TDMA, C-SR), any other potential features in the scope of PAR (e.g. features for Time-sensitive networks)” to candidate Release 2 features

**Yes/No/Abstain/No answer: 58/55/20/39**

Comment: Is this a technical or procedural question?

Answer: This is a technical question.

1. [**697r1**](https://mentor.ieee.org/802.11/dcn/20/11-20-0697-01-00be-supporting-latency-sensitive-applications-in-11be.pptx)**, “Serving low latency applications in r1” – Chunyu Hu (Facebook)**

**Summary:** The authors emphasize that VR/AR is important not only for gaming industry, but for social interactions in times of pandemic. They list technical areas that are sufficient and lacking in maturity for latency. For release 1 they suggest to target single BSS solutions, while for release 2 multiple-BSS solutions.

**Discussion:**

C: In general I support the QoS provisioning. In my opinion the straw poll is too focused on low latency. I would like to see other aspects as jitter, etc. One suggestion is to make it support a QoS framework that supports multiple KPIs.

A: Let’s wait with the discussion on SP text. First I would like to obtain general opionion about our proposal.

C: Can you elaborate with what you mean is lacking in the multi-link aspect?

A: The multi-link itself will not solve the latency challenge.

C: In general MLO will help with low latency. But your point is that what happens if all STAs have similar traffic. When you have contention you would like to enforce some sort of scheduling. 802.11ax introduced trigger based scheduling. Have you considered how TB scheduling works?

A: Trigger is good means but it becomes very hard for the AP to do this effectively.

C: I believe the SP is a bit vague and it should be more specific.

A: Ok.

C: Slide 17, these classes, do you think we should consider these classes with different priority? For example some of these applications are easier to target.

C: Slide 13, second subbullet. What do you mean?

A: The main purpose is that we need some link management.

There is a question to extend the meeting with 5 minutes. The Chair asks if there is any objection. There is. Since the meeting time is out, the meeting adjourns.

**Adjourned at 13:00.**