IEEE P802.11
Wireless LANs

|  |
| --- |
| TGbe 2020 May to July teleconference minutes |
| Date: 2020-05-15 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Dennis Sundman | Ericsson AB |  |  | dennis.sundman@ericsson.com |
|  |  |  |  |  |

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 18th – 27th of May. Added minutes for telephone conference 28th of May.
* Rev 2: Updated a mistake in the straw poll from 28th of May. Added references to conferences held 1st – 10th of June. Added minutes from Thursday 11th of June.
* Rev 3: Updated the motion counts and added Appendix 1.

# 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) and Alfred Asterjadhi (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/20/11-20-0777-08-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-03-00be-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/20/11-20-0777-08-00be-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/20/11-20-0777-08-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-03-00be-minutes-802-11-be-phy-ad-hoc-telephone-conferences-may-july-2020.docx>

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

Only MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-08-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>

# 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) and Alfred Asterjadhi (aasterja@qti.qualcomm.com)
	* Please ensure that the following information is listed correctly when joining the call:
		+ "[voter status] First Name Last Name (Affiliation)"
	* 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: 68/55/20/39**

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.**

# Monday 1 June 2020, 10:00 – 1300 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-08-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-03-00be-minutes-802-11-be-phy-ad-hoc-telephone-conferences-may-july-2020.docx>

# Wednesday 3June 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 4 June 2020, 19:00 – 22:00 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-08-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-03-00be-minutes-802-11-be-phy-ad-hoc-telephone-conferences-may-july-2020.docx>

# Monday 8 June 2020, 19:00 – 22:00 ET

Split PHY and MAC.

* MAC: <https://mentor.ieee.org/802.11/dcn/20/11-20-0777-08-00be-minutes-for-tgbe-mac-ad-hoc-teleconferences-may-and-july-2020.docx>
* PHY: <https://mentor.ieee.org/802.11/dcn/20/11-20-0787-03-00be-minutes-802-11-be-phy-ad-hoc-telephone-conferences-may-july-2020.docx>

# Wednesday 10 June 2020, 10:00 – 13:00 ET

Only MAC.

* MAC: currently N/A.

# Thursday 11 June 2020, 10:00 – 13:00 ET

**Introduction**

1. The Chair, Alfred Asterjadhi (Qualcomm), calls the meeting to order at 10:02 AM.
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) and Alfred Asterjadhi (aasterja@qti.qualcomm.com)
	* Please ensure that the following information is listed correctly when joining the call:
		+ "[voter status] First Name Last Name (Affiliation)"
	* List of attendees:
* Aboulmagd, Osama Huawei Technologies Co.,  Ltd
* Adhikari, Shubhodeep Broadcom Corporation
* Agarwal, Peyush Broadcom Corporation
* Aio, Kosuke Sony Corporation
* An, Song-Haur INDEPENDENT
* Ansley, Carol CommScope
* Asterjadhi, Alfred Qualcomm Incorporated
* Au, Kwok Shum Huawei Technologies Co.,  Ltd
* Baik, Eugene Qualcomm Incorporated
* baron, stephane Canon Research Centre France
* Bei, Jianwei NXP Semiconductors
* Bhandaru, Nehru Broadcom Corporation
* Boldy, David Broadcom Corporation
* Bredewoud, Albert Broadcom Corporation
* Cao, Rui NXP Semiconductors
* Cariou, Laurent Intel Corporation
* 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.
* Cho, Hangyu LG ELECTRONICS
* Choi, Jinsoo LG ELECTRONICS
* CHUN, JINYOUNG LG ELECTRONICS
* Das, Dibakar Intel Corporation
* Das, Subir Perspecta Labs Inc.
* DeLaOlivaDelgado, Antonio InterDigital, Inc.
* Derham, Thomas Broadcom Corporation
* de Vegt, Rolf Qualcomm Incorporated
* Dong, Xiandong Xiaomi Inc.
* Doostnejad, Roya Intel Corporation
* 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
* Ghosh, Chittabrata Intel Corporation
* Godbole, sachin Broadcom Corporation
* Guo, Yuchen Huawei Technologies Co., Ltd
* Han, Zhiqiang ZTE Corporation
* Hervieu, Lili Cable Television Laboratories Inc. (CableLabs)
* Hirata, Ryuichi Sony Corporation
* Ho, Duncan Qualcomm Incorporated
* Hsieh, Hung-Tao MediaTek Inc.
* Hu, Chunyu Facebook
* Huang, Guogang  Huawei
* Huang, Lei Panasonic Asia Pacific Pte Ltd.
* Huang, Po-Kai Intel Corporation
* Inoue, Yasuhiko Nippon Telegraph and Telephone Corporation (NTT)
* Jang, Insun LG ELECTRONICS
* Ji, Chenhe Huawei Technologies Co. Ltd
* Jiang, Jinjing Apple, Inc.
* Kain, Carl USDoT
* Kakani, Naveen Qualcomm Incorporated
* Kedem, Oren Huawei Technologies Co. Ltd
* Khorov, Evgeny IITP RAS
* Kim, Jeongki LG ELECTRONICS
* Kim, Myeong-Jin SAMSUNG
* kim, namyeong LG ELECTRONICS
* Kim, Sang Gook LG ELECTRONICS
* Kim, Sanghyun WILUS Inc
* Kim, Yongho Korea National University of Transportation
* Kishida, Akira Nippon Telegraph and Telephone Corporation (NTT)
* Klein, Arik Huawei Technologies Co. Ltd
* 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
* Lan, Zhou Broadcom Corporation
* Lansford, James Qualcomm Incorporated
* Lee, Wookbong SAMSUNG
* Levitsky, Ilya IITP RAS
* Levy, Joseph InterDigital, Inc.
* Li, Yiqing Huawei Technologies Co. Ltd
* Li, Yunbo Huawei Technologies Co., Ltd
* Liang, dandan Huawei Technologies Co., Ltd
* Lim, Dong Guk LG ELECTRONICS
* LIU, CHENCHEN Huawei Technologies Co., Ltd
* Liu, Jianhan MediaTek Inc.
* Lopez, Miguel Ericsson AB
* Lou, Hanqing InterDigital, Inc.
* Lu, Liuming ZTE Corporation
* Lv, kaiying MediaTek Inc.
* Lv, Lily Huawei Technologies Co. Ltd
* Madpuwar, Girish Broadcom Corporation
* Memisoglu, Ebubekir IMU,Vestel
* Mirfakhraei, Khashayar Cisco Systems, Inc.
* Montreuil, Leo Broadcom Corporation
* NANDAGOPALAN, SAI SHANKAR Cypress Semiconductor Corporation
* Naribole, Sharan SAMSUNG
* Nezou, Patrice Canon Research Centre France
* noh, yujin Newracom Inc.
* Ouchi, Masatomo Canon
* Palm, Stephen Broadcom Corporation
* Pare, Thomas MediaTek Inc.
* Park, Eunsung LG ELECTRONICS
* Park, Sung-jin LG ELECTRONICS
* Patil, Abhishek Qualcomm Incorporated
* Patwardhan, Gaurav Hewlett Packard Enterprise
* Petrick, Albert InterDigital, Inc.
* Pettersson, Charlie Ericsson AB
* porat, ron Broadcom Corporation
* Puducheri, Srinath Broadcom Corporation
* Pulikkoonattu, Rethnakaran Broadcom Corporation
* Redlich, Oded HUAWEI
* 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
* 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
* Tanaka, Yusuke Sony Corporation
* Tian, Bin Qualcomm Incorporated
* Torab Jahromi, Payam Facebook
* Tsodik, Genadiy Huawei Technologies Co. Ltd
* Urabe, Yoshio Panasonic Corporation
* Verma, Sindhu Broadcom Corporation
* Vermani, Sameer Qualcomm Incorporated
* VIGER, Pascal Canon Research Centre France
* Wang, Chao Chun MediaTek Inc.
* Wang, Huizhao Quantenna Communications, Inc.
* Wang, Lei Huawei R&D USA
* Wang, Qi Apple, Inc.
* Wang, Xiaofei InterDigital, Inc.
* Wu, Tianyu Apple, Inc.
* Xin, Yan Huawei Technologies Co., Ltd
* Yan, Aiguo Oppo
* Yang, Bo Huawei Technologies Co. Ltd
* Yang, Steve TS MediaTek Inc.
* yang, xun Huawei Technologies Co., Ltd
* 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
* Yukawa, Mitsuyoshi Canon, Inc.
* Zegrar, Salah Eddine [NV] Salah Eddine ZEGRAR (Vestel)
* Zhang, Meihong Huawei Technologies Co., Ltd
* Zhang, Yan NXP Semiconductors
1. The Chair asks if there is any objection to approve the agenda.
	* Comment: Chunyu Hu is first in the agenda. This is listed as SP. Is it possible to spend at least 15 minutes to recap before the SPs?
	* Reply: Yes that is fine.
	* Agenda approved.
2. Announcements:
	* Discuss suggested cancellation request for July 1st conf call (Canada Holiday)
		+ The Chair asks to rise hands to figure how many will be attending.
		+ C: In fairness, if we consider holidays in one country we should consider holidays in all countries.
		+ C: I think you should run a SP.
		+ SP result “Do you prefer to cancel the July 1st conference call?”:

Y/N/A/No answer: 78, 21, 40, 25

* + Convert June 29th to Joint.
		- The secretary (Dennis Sundman, Ericsson) will not be able to attend. No objection to convert.
	+ Teleconferences during summer season (time off):
		- One week with no conference calls during July or August.
		- Planning to have 1 week in August without conference calls.
		- Discussion:
			* C: The needs for conference calls will depend on what happens with the September meeting.
			* A: (Jon) The week of June 22nd is when the September meeting will be “go or no go”.
			* C: PHY is making good progress, so there will be fewer PHY conference calls.
		- Comment to try to synchronize with the other TGs. Which week is TBD.
	1. SP: Do you prefer to cancel July 6th conference call?

* + - Yes/No/Abstain/No answer: 87/17/28/38
		- The meeting at July 6th cancelled.
		- Comment: I think cancelling is fine, but adding conference call to the schedule is typically more tricky because people have other appointments in their calendars.

**Motions:**

1. **The Chair explains the procedures for the motions.**
2. **Approve TG minutes.**

Move to approve TGbe minutes of meetings and teleconferences from November 2019 meeting to today:

* + January F2F meeting: <https://mentor.ieee.org/802.11/dcn/20/11-20-0228-01-00be-meeting-minutes-january-2020.docx>
	+ Teleconferences Feb-March: <https://mentor.ieee.org/802.11/dcn/20/11-20-0287-06-00be-telephone-conference-meeting-minutes-february-and-march-2020.docx>
	+ Teleconferences April: <https://mentor.ieee.org/802.11/dcn/20/11-20-0570-04-00be-telephone-conference-meeting-minutes-april-2020.docx>

Move: Edward Au, Second: Subir Das

Discussion: No discussion.

**Result: Approved with unanimous consent.**

1. **Motion 111**

Move to add to the 11be SFD candidate specification text in 11-20/566r28 that is identified with the following tags:

* + SP0611-01, SP0611-02, SP0611-03, SP0611-04, SP0611-05, SP0611-06, SP0611-07, SP0611-08, SP0611-09, SP0611-10, SP0611-11, SP0611-12, SP0611-13, SP0611-14, SP0611-15, SP0611-16, SP0611-17, SP0611-18, SP0611-19, SP0611-20, SP0611-21, SP0611-22, SP0611-23, SP0611-24, SP0611-25, SP0611-26, SP0611-27, SP0611-28, SP0611-29, SP0611-30, SP0611-31, SP0611-32, SP0611-33, SP0611-34, SP0611-35, SP0611-36,

Discussion:

C: What is the meaning of the “SP0611”

A: In order to make it easier for people to identify I grouped them together. (6/11 is today’s date).

C: If this motion passes, will these SPs be moved into the SFD?

A: Yes.

Move: Bin Tian, Second: Edward Au

**Result: Approved with unanimous consent.**

Note: These are all candidate SFD texts highlighted in green

1. **Motion 112**

Move to add to the 11be SFD candidate specification text in 11-20/566r28 that is identified with the following tags:

* + SP1, SP2, SP3, SP4, ~~SP5~~, SP6, SP7, SP8, SP9, SP10, SP11, SP12, SP13, SP14, SP15, SP16, SP17, SP18, SP19, SP20, SP21, SP22, SP23, SP24, SP25, SP26, SP27, ~~SP28~~, SP29, SP30, SP31, SP32, SP33, SP34, SP35, SP36, SP37, SP38, SP39, SP40, SP41, SP42, SP43, SP44, SP45, SP46, SP47, SP48, SP49, SP50, SP51, SP52, SP53, SP54, SP55

Move: Laurent Cariou, Second: Bin Tian

Discussion:

C: There are SPs with higher number than 55 with yellow text.

A: To be considered in the next round of motions.

**Result: Approved with unanimous consent**

* + Note: These are all candidate SFD texts highlighted in yellow that have not received a request for further discussion
1. **Motion 113** (Amended from nr 114)

Move to add to the 11be SFD candidate specification text in 11-20/566r28 that is identified with the following tags:

* + SP28

Move: Wook Bong Lee, Second: Bin Tian

Discussion:

C: This SP should be discussed in a joint call before we can make a decision.

C: Several things we discussed in the PHY group.

C: I don’t think this is necessary.

C: Why does the .11ax solution not work for .11be?

C: Technical discussion back and forth. Argument that MAC guys should be part of the discussion. Question regarding the BW.

* + Note: These are all candidate SFD texts highlighted in yellow that have received a request for further discussion

Result:

~~Y/N/A/No-answer: 69/20/38/55 🡪 Preliminary passed. (Need to check only Voting members voted)~~

Final result: Y/N/A: 66/19/35 🡪 Passes. See Appendix 1 for details.

1. **Motion 114 (Amended from nr 114)**

Move to add to the 11be SFD candidate specification text in 11-20/566r28 that is identified with the following tags:

* SP5

Discussion:

C: I think we should amend the text in SP5. I think the best way to do that is to run the SP now and amend the text later.

C: There are two SP5?

A: The appendix corresponds to the original text, this is modified to suit the SFD.

C: I don’t think we should run a motion with a broken text. I suggest we have further discussion and make a complete motion.

C: I think we should table the motion and move on.

Move: Abhisek Patil, Second: George Cherian

Discussion: No discussion.

* Note: These are all candidate SFD texts highlighted in yellow that have received a request for further discussion

Result:

~~Yes/No/Abstain/No-answer: 71/23/27/58 🡪 Preliminary passes. (Need to check only Voting members voted)~~

Final result: Y/N/A: 70/21/25 🡪 Passes. See Appendix 1 for details.

**The editor points out that some motions will be in conflict. He will make comments in the document to that.**

**Submissions:**

1. [**697r**](https://mentor.ieee.org/802.11/dcn/20/11-20-0697-03-00be-supporting-latency-sensitive-applications-in-11be.pptx)**3 Serving low latency applications in r1 (Chunyu Hu) [SPs]**

SP: Do you support a staged feature development to support latency sensitive applications as following

* + Release 1:
		- A basic framework under multi-link operation framework that includes link management and QoS provisioning
		- Channel access optimization/design for low latency
	+ Release 2:
		- Extend to support multi-BSS coordination for low latency
		- Any additional features (including additional channel access improvements)

Notes

* + Channel access improvement for low latency implies more predictable channel access
	+ R1 can include any other essential components to make the framework functional.
	+ Whether to introduce different mechanisms for different classes of low-latency applications is TBD

Discussion:

C: The TBD in the third Notes point, is it for R1 or R2?

A: We don’t know.

C: You want to have predictable channel access for R1 or R2?

A: We would like to have it within a single BSS case for R1.

C: Should I interpret the first bullet for R1 as generic framework or only for low latency.

A: General framework, but emphasis on low latency.

C: If we start opening up this for R1 now, we will get plenty of contributions. I think we should do it for R2 instead.

A: I think the R1 will not be very exciting in that case.

C: There is a related presentation on Mentor, would you wait with the SP until that contribution?

A: I would like to run the SP.

C: I think the first bulletpoint under R1, is sufficient for R1.

A: Ok.

C: I believe the group has a lot of bandwidth and all our targets will be fulfilled.

C: I think it is critical we get low latency into R1 because of market needs.

Result:

Y/N/A/No-answer: 87/21/40/39

1. [**292r**](https://mentor.ieee.org/802.11/dcn/20/11-20-0292-01-00be-mlo-typical-operating-scenarios-and-sub-feature-prioritization.pptx)**1 MLO Typical Op. Scen. & Sub-feature prioritization – Zhou Lan (Broadcom)**

Summary: The authors provides an overview of the MLO and try to subdivide the standardization efforts.

Straw poll 1:

* + Do you agree the following mode of MLO operations are in 11be R1 sub-features? Other mode of operation is TBD (e.g. mode to support NSTR AP)

Comment:

C: I would like to defer this SP until after further discussion.

C: Regarding the enhanced single link radio, I don’t know why you put it here. This was not agreed in the group. This enhanced radio is a multiple-radio. This is in a sense performance worse than multiple radio. I want to leave it to R2.

C: What is your definition of a multi-radio?

A: It means concurrent TX/TX or RX/RX.

A bit heated discussion back and forth about the relevance of the SP.

Result:

Y/N/A/No-answer: 50/41/32/51.

1. [**755r0**](https://mentor.ieee.org/802.11/dcn/20/11-20-0755-00-00be-non-str-ap-operation.pptx) **Non-STR AP Operation (Jinjing Jiang)**

Summary: The authors consider non-STR APs and how they interact with legacy STAs. They believe non-STR AP MLD shall be supported in R1.

SP1: Do you agree to define mechanisms to support the operation of a Non-STR AP MLD in R1?

Discussion:

C: What is the performance gain of this? From a timeline standpoint is this worth adding this?

A: There is gain to be had. There is nothing substantial new from what we have discussed.

C: This is already complicated from the AP perspective, now you bring this to the STA side.

A: I don’t understand the point.

**Adjourn at 13:00 ET.**

# Appendix 1

Here are the Motion results for joint telco Thursday 11 June 2020.

Motion 111: Approved by unanimous consent.

Motion 112: Approved by unanimous consent.

1.Motion 113: Move to add to the 11be SFD candidate specification text in 11-20/566r28 that is identified with the following tags: SP28

 A.YES ~~69/182 ( 38%)~~  after update: **66**

 B.NO ~~20/182 ( 11%)~~ after update: **19**

 C.ABSTAIN ~~38/182 ( 21%)~~ after update: **35**

No Answer 55/182 ( 30%)

 A B C

 --------------------------------------------------------

 [V]XIANDONG DONG(XIAOMI) | | X | |

 [V] Carol Ansley (CommScope) | | | X |

 [V] Jim Lansford (Qualcomm) | X | | |

 Subir | X | | | [AA] Counted. Voter. IDed as Subir Das, Perspecta Labs, ExOfficio.

 [V] Abhishek Patil (Qualcomm) | X | | |

 [V] Yujin Noh (Newracom) | X | | |

 [V] Girish Madpuwar (Broadcom) | X | | |

 [V] Chao-Chun Wang (MediaTek) | | | X |

 [V] Rui Yang (InterDigital) | | | X |

 [V] Duncan Ho (Qualcomm) | X | | |

 [V] osama aboul-magd ( Huawei) | | X | |

 [V] Sang Kim (LGE) | X | | |

 [V]Jarkko Kneckt (Apple) | X | | |

 [V] Bin Tian (Qualcomm) | X | | |

 [V] Lei Wang (Futurewei/Huawei) | | | X |

 [V] Po-Kai Huang (Intel) | X | | |

 [V] Li-Hsiang Sun (interdigital) | | | X |

 [V] Wookbong Lee (Samsung) | X | | |

 [V] Junghoon Suh (Huawei) | | X | |

 [V] Chunyu Hu (FB) | | | X |

 [V] Yan Xin (Huawei) | | X | |

 [V] laurent cariou, Intel | X | | |

 [V] Song H An (Independent) | | | X |

 [V] Ryuichi Hirata (Sony) | | | X |

 [V] Carl Kain (USDOT/Noblis) | | | X |

 [V] Lily Lv (Huawei) | | X | |

 [V] Huizhao Wang (Quantenna/ON Semi) | X | | |

 [V] Ming Gan (Huawei) | | X | |

 [V] dibakar das (Intel) | X | | |

 [V] Youhan Kim (Qualcomm) | X | | |

 [V] Chittabrata Ghosh (Intel) | | | X |

 [V] Sindhu Verma (Broadcom) | X | | |

 [V] Jinjing Jiang (Apple) | X | | |

 David Xun Yang (Huawei) | | X | | [AA] Counted. Voter.

 [V] Insun Jang (LGE) | X | | |

 [V] Lei Huang (Panasonic) | | | X |

 [V] Jinsoo Choi (LGE) | X | | |

 [V] Steve TS Yang (MediaTek) | X | | |

 [V] Kazuto Yano (ATR) | X | | |

 [V] Taewon Song (LGE) | | | X |

 ~~[A] Sungjin Park (LGE) | X | | |~~ [AA] Not Counted. Aspirant voter.

 Yusuke Tanaka | | | X | [AA] Counted. Voter.

 [V] Dandan Liang (Huawei) | | X | |

 [V] James Yee, MediaTek | X | | |

 ~~[N] Zhiqiang Han(ZTE) | | | X |~~  [AA] Not Counted. Non-voter.

 [V] Kosuke Aio (Sony) | X | | |

 [V] Jeongki Kim (LG Electronics) | | | X |

 ~~[P] Yifan Zhou (Huawei) | | X | |~~ [AA] Not Counted. Potential voter.

 [V] Yoshio Urabe (Panasonic) | | | X |

 [V] Ronny Yongho Kim (KNUT) | | | X |

 [V]Chenhe Ji (Huawei) | | X | |

 [V] Akira Kishida (NTT) | | | X |

 [V] Yasuhiko Inoue (NTT) | X | | |

 [V] Yang Bo (Huawei) | | X | |

 [V] Ross Jian Yu (Huawei) | | X | |

 [V] sachin godbole (broadcom) | X | | |

 [V] Stephane Baron (Canon) | | | X |

 [V] Oren Kedem (Huawei) | | X | |

 [V] Patrice NEZOU (Canon) | | | X |

 [V] Dennis Sundman (Ericsson) | X | | |

 [V] Evgeny Khorov (IITP RAS) | | | X |

 [V] Genadiy Tsodik (Huawei) | | X | |

 [V] Allert van Zelst (Qualcomm) | X | | |

 [V] Oded Redlich (Huawei) | | X | |

 [V] Arik Klein (Huawei) | | | X |

 [V] Albert Bredewoud (Broadcom) | X | | |

 [V] Massinissa Lalam (Sagemcom) | | | X |

 [V] Pascal VIGER (Canon) | | | X |

 ~~[NV] Hanadi Salman (IMU, VESTEL) | X | | |~~ [AA] Not Counted. Non-voter.

 [V] Edward Au (Huawei) | X | | |

 [V] Rui Cao (NXP) | X | | |

 [V] Bill Carney (Sony) | X | | |

 [V] Sigurd Schelstraete (ON/Quantenna) | | | X |

 [V] Jianhan Liu (Meditak Inc.) | X | | |

 [V] Rethna Pulikkoonattu (Broadcom) | X | | |

 [V] Yongho Seok (MediaTek) | | | X |

 [V] Matthew Fischer {Broadcom} | X | | |

 [V] Mohamed Abouelseoud (Sony) | | | X |

 [V] Yong Liu (Apple) | X | | |

 [V] Jon Rosdahl (Qualcomm) | X | | |

 [BRCM] kiwin | X | | | [AA] Counted. IDed as [V] Stephen Palm, Broadcom.

 [V] Ron Porat (Broadcom) | X | | |

 [V] Cheng Chen (Intel) | X | | |

 [V] Srinivas Kandala (Samsung) | X | | |

 [V] paul cheng (MediaTek) | X | | |

 [v] Rolf de Vegt (Qualcomm) | X | | |

 Qi Wang | X | | | [AA] Counted. Voter.

 [V] Sudhir Srinivasa [NXP] | X | | |

 [V] Robert Stacey (Intel) | X | | |

 [V] Hanseul Hong (Yonsei Univ.) | | | X |

 [V] Thomas Pare (Mediatek) | X | | |

 [V] Thomas Derham | X | | |

 [V] Jason Yuchen Guo (Huawei) | | X | |

 ~~[P]Chenchen LIU(Huawei) | | | X |~~ [AA] Not Counted. Potential voter.

 HanGyu Cho (LGE) | | | X | [AA] Counted. Voter.

 ~~[N] Namyeong Kim (LGE) | | | X |~~ [AA] Not Counted. Non-voter.

 [V] Yunbo Li (Huawei Technologies) | | X | |

 ~~[P]Ding Yanyi (Panasonic) | X | | |~~  [AA] Not Counted. Potential voter.

 [V] Dongguk Lim (LGE) | X | | |

 [V]Guogang Huang (Huawei) | | X | |

 [V] Rojan Chitrakar (Panasonic) | | | X |

 [V] Minyoung Park (Intel Corp.) | X | | |

 [V]Manish Kumar (nxp)\_ | | | X |

 [V] Shimi Shilo (Huawei) | | X | |

 [V] Yanjun Sun (Qualcomm) | X | | |

 [V] Gaurav Patwardhan (HPE) | | | X |

 [V] Sharan Naribole (Samsung) | X | | |

 [V] Peyush Agarwal (Broadcom) | X | | |

 [V] George Cherian (Qualcomm) | X | | |

 [V] Mao Yu (NXP) | X | | |

 [V] Tianyu Wu (Apple) | X | | |

 [V] Paul Strauch (Qualcomm) | X | | |

 [V] Chris Young (Broadcom) | X | | |

 [V] Xiaogang Chen (Intel) | X | | |

 [V] Yan Zhang (NXP) | | | X |

 [V] Payam Torab (Facebook) | X | | |

 [V] Nehru Bhandaru {Broadcom} | X | | |

 [V] Sameer Vermani (Qualcomm) | X | | |

 [V] Noel Stott (Keysight Technologies) | X | | |

 [V] Miguel Lopez (Ericsson) | | | X |

 [V] Xiaofei Wang (InterDigital) | | | X |

 [V] Shubhodeep Adhikari (Broadcom) | X | | |

 [V] Lili Hervieu (CableLabs) | | | X |

 [V] Vinko Erceg | X | | |

 [V] Reza Hedayat (Charter) | | X | |

 [v] Prabodh Varshney (Nokia) | X | | |

1. Motion 114: Move to add to the 11be SFD candidate specification text in 11-20/566r28 that is identified with the following tags: SP5

 A.YES ~~71/179 ( 40%)~~ after update: **70**

 B.NO ~~23/179 ( 13%)~~ after update: **21**

 C.ABSTAIN ~~27/179 ( 15%)~~ after update: **25**

No Answer 58/179 ( 32%)

 A B C

 --------------------------------------------------------

 [V} Zhou Lan (Broadcom) | X | | |

 [V]XIANDONG DONG(XIAOMI) | | X | |

 [V] Carol Ansley (CommScope) | | | X |

 [V] Jim Lansford (Qualcomm) | X | | |

 Subir | X | | | [AA] Counted. Voter. IDed as Subir Das, Perspecta Labs, ExOfficio.

 [V] Abhishek Patil (Qualcomm) | X | | |

 [V] Yujin Noh (Newracom) | | | X |

 [V] Girish Madpuwar (Broadcom) | X | | |

 [V] Chao-Chun Wang (MediaTek) | X | | |

 [V] Rui Yang (InterDigital) | | X | |

 [V] Duncan Ho (Qualcomm) | X | | |

 [V] osama aboul-magd ( Huawei) | | X | |

 [V] Sang Kim (LGE) | | | X |

 [V]Jarkko Kneckt (Apple) | X | | |

 [V] Bin Tian (Qualcomm) | X | | |

 [V] Lei Wang (Futurewei/Huawei) | X | | |

 [v] Liwen Chu(NXP) | X | | |

 [V] Po-Kai Huang (Intel) | X | | |

 [V] Li-Hsiang Sun (interdigital) | | | X |

 [V] Wookbong Lee (Samsung) | X | | |

 [V] Junghoon Suh (Huawei) | | X | |

 [V] Chunyu Hu (FB) | | | X |

 [V] Yan Xin (Huawei) | | X | |

 [V] laurent cariou, Intel | X | | |

 [V] Song H An (Independent) | | | X |

 [V] Ryuichi Hirata (Sony) | X | | |

 [V] Lily Lv (Huawei) | | X | |

 [V] Huizhao Wang (Quantenna/ON Semi) | X | | |

 [V] Ming Gan (Huawei) | | X | |

 [v] kaiying lu (MediaTek) | X | | |

 [V] dibakar das (Intel) | X | | |

 [V] Youhan Kim (Qualcomm) | X | | |

 [V] Chittabrata Ghosh (Intel) | | | X |

 [V] Sindhu Verma (Broadcom) | X | | |

 [V] Jinjing Jiang (Apple) | X | | |

 [V] Insun Jang (LGE) | X | | |

 [V] Jinsoo Choi (LGE) | X | | |

 [V] Kazuto Yano (ATR) | X | | |

 [V] Taewon Song (LGE) | X | | |

 ~~[A] Sungjin Park (LGE) | X | | |~~ [AA] Not Counted. Aspirant Voter.

 ~~[N] Masatomo OUCHI | | | X |~~ [AA] Not Counted. Non-voter.

 Yusuke Tanaka | | | X | [AA] Counted. Voter.

 [V] Dandan Liang (Huawei) | | X | |

 [V] James Yee, MediaTek | X | | |

 [V] Kosuke Aio (Sony) | X | | |

 [V] Jeongki Kim (LG Electronics) | | | X |

 ~~[P] Yifan Zhou (Huawei) | | X | |~~ [AA] Not Counted. Potential Voter.

 [V] Yoshio Urabe (Panasonic) | | | X |

 [V]Chenhe Ji (Huawei) | | X | |

 [V] Akira Kishida (NTT) | | | X |

 [V] Yang Bo (Huawei) | | X | |

 [V] Ross Jian Yu (Huawei) | | X | |

 [V] sachin godbole (broadcom) | X | | |

 [V] Stephane Baron (Canon) | X | | |

 [V] Oren Kedem (Huawei) | | X | |

 [V] Patrice NEZOU (Canon) | X | | |

 [V] Dennis Sundman (Ericsson) | | | X |

 [V] Allert van Zelst (Qualcomm) | X | | |

 [V] Oded Redlich (Huawei) | | X | |

 [V] Arik Klein (Huawei) | | X | |

 [V] Albert Bredewoud (Broadcom) | X | | |

 [V] Massinissa Lalam (Sagemcom) | | | X |

 [V] Pascal VIGER (Canon) | X | | |

 [V] Edward Au (Huawei) | | | X |

 [V] Steve Shellhammer (Qualcomm) | X | | |

 [V] Eunsung Park (LGE) | X | | |

 [V] Rui Cao (NXP) | | | X |

 [V] Sigurd Schelstraete (ON/Quantenna) | | | X |

 [V] Jianhan Liu (Meditak Inc.) | X | | |

 [V] Rethna Pulikkoonattu (Broadcom) | X | | |

 [V] Yongho Seok (MediaTek) | X | | |

 [V] Matthew Fischer {Broadcom} | X | | |

 [V] Mohamed Abouelseoud (Sony) | | | X |

 [V] Yong Liu (Apple) | | | X |

 [V] Jon Rosdahl (Qualcomm) | X | | |

 [V] Ron Porat (Broadcom) | X | | |

 Saishankar Nandagopalan | X | | | [AA] Counted. Voter.

 [V] Cheng Chen (Intel) | X | | |

 [V] Srinivas Kandala (Samsung) | X | | |

 [V] paul cheng (MediaTek) | X | | |

 [V] Pooya Monajemi (Cisco) | X | | |

 [v] Rolf de Vegt (Qualcomm) | X | | |

 [V] Robert Stacey (Intel) | X | | |

 [V] Hanseul Hong (Yonsei Univ.) | | X | |

 [V] Thomas Pare (Mediatek) | X | | |

 [V] Eugene Baik (Qualcomm) | X | | |

 [V] Jason Yuchen Guo (Huawei) | | X | |

 ~~[P]Chenchen LIU(Huawei) | | X | |~~ [AA] Not Counted. Potential Voter.

 HanGyu Cho (LGE) | | | X | [AA] Counted. Voter.

 [V] Yunbo Li (Huawei Technologies) | | X | |

 ~~[P]Ding Yanyi (Panasonic) | | | X |~~ [AA] Not Counted. Potential Voter.

 [V] Dongguk Lim (LGE) | X | | |

 [V]Guogang Huang (Huawei) | | X | |

 [V] Rojan Chitrakar (Panasonic) | X | | |

 [V] Minyoung Park (Intel Corp.) | X | | |

 [V]Manish Kumar (nxp)\_ | | | X |

 [V] Shimi Shilo (Huawei) | | X | |

 [V] Naveen Kakani (Qualcomm) | X | | |

 [V] Yanjun Sun (Qualcomm) | X | | |

 [V] Gaurav Patwardhan (HPE) | X | | |

 [V] Sharan Naribole (Samsung) | X | | |

 [V] Peyush Agarwal (Broadcom) | X | | |

 Dave Cavalcanti | X | | | [AA] Counted. Voter.

 [V] VK Jones | X | | |

 [V] George Cherian (Qualcomm) | X | | |

 [V] Xin Zuo -- Tencent | | | X |

 [V] Mao Yu (NXP) | X | | |

 [V] Tianyu Wu (Apple) | | | X |

 [V] Paul Strauch (Qualcomm) | X | | |

 [V] Chris Young (Broadcom) | X | | |

 [V] Xiaogang Chen (Intel) | | | X |

 [V] Yan Zhang (NXP) | | | X |

 [V] Payam Torab (Facebook) | | | X |

 [V] Nehru Bhandaru {Broadcom} | X | | |

 [V] Sameer Vermani (Qualcomm) | X | | |

 [V] Noel Stott (Keysight Technologies) | X | | |

 [V] Miguel Lopez (Ericsson) | X | | |

 [V] Xiaofei Wang (InterDigital) | | X | |

 [V] Shubhodeep Adhikari (Broadcom) | X | | |

 [v] Prabodh Varshney (Nokia) | X | | |

 [V] Joseph Levy (InterDigital) | | X | |