IEEE P802.11  
Wireless LANs

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| Minutes of 802.11be PHY ad hoc Telephone Conferences,  May to July 2021 | | | | |
| Date: 2021-05-27 | | | | |
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Abstract

This document contains the PHY ad hoc meeting minutes for TGbe teleconferences held on:

* May 27, 2021 (R0)
* June 7, 2021 (R1)
* June 17, 2021 (R2)

**Thursday May 27th, 2021 10:00 – 12:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 AM ET.
2. The Chair follows the agenda in 11-21/785r9
3. The Chair goes through the IPR policy and asks if anyone is aware of any potentially essential patents. Nobody speaks up.
4. The Chair goes through the Copyright policy.
5. The Chair reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (MaxLinear) or the Chair himself if unable to record attendance via IMAT system.
6. Announcements:
7. Agenda

**Technical Submissions: PDTs**

* + [893r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0893-00-00be-pdt-correction-to-trigger-frame-ru-allocation-table.docx) PDT Correction to Trigger Frame RU Allocation Table Steve Shellhammer

**Technical Submissions:**

* + [368r3](https://mentor.ieee.org/802.11/dcn/21/11-21-0368-03-00be-diversity-enhancement-for-dup-mode.pptx) Diversity Enhancement for DUP mode Ali Tugberk Dogukan

**Submissions**

**893r0 PDT Correction to Trigger Frame RU Allocation Table (Steve Shellhammer)**

MRU996+484+242 should be limited to 160 MHz PPDUs. It’s currently also allowed for 320 MHz, which is not consistent with the agreements on MRU996+484+242.

SP1:

Do you agree to accept the proposed text modifications 11-21/893r1for the next draft 802.11be?

No objection

**368r3 Diversity Enhancement for DUP mode (Ali Tugberk Dogukan)**

New Proposed Method for Enhancing Diversity. Error performance is evaluated through simulations, showing 0.1-0.25 dB gain depending on channel model and bandwidth. PAPR distribution is not affected.

Discussion

Q: How many Tx/Rx antennas are used?

A: 1 Tx, this is SISO.

C: increasing #antennas might show less gain

Q: Would gain be the same with real impairments? May be worth checking.

A: thinks so. We can include it.

SP deferred

**Adjourn**

Meeting is adjourned at 10:30 ET.

**Monday June 7th, 2021 19:00 – 21:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 AM ET.
2. The Chair follows the agenda in 11-21/785r14
3. The Chair goes through the IPR policy and asks if anyone is aware of any potentially essential patents. Nobody speaks up.
4. The Chair goes through the Copyright policy.
5. The Chair reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (MaxLinear) or the Chair himself if unable to record attendance via IMAT system.
6. Announcements:
7. Agenda

* Technical Submissions**: PDTs**
  + [783r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0783-00-00be-reference-correction-in-36-3-12-2-2.docx) Reference correction in 36-3-12-2-2 Genadiy Tsodik
  + [916r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0916-00-00be-pdt-additional-corrections-to-the-trigger-frame-ru-allocation-table.docx) PDT Add.l. Corrections to the TF RU Allocation Table Steve Shellhammer
  + [907r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0907-01-00be-pdt-note-in-trigger-frame-ru-allocation-table.docx) PDT NOTE in Trigger Frame RU Allocation Table Mengshi Hu
  + [886r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0886-00-00be-proposed-changes-to-sounding-fb.docx) Proposed changes to sounding FB Xiaogang Chen
* Technical Submissions:
  + [618r3](https://mentor.ieee.org/802.11/dcn/21/11-21-0618-03-00be-evm-and-sfo-sto.pptx) EVM and SFO/STO Brian Hart
  + [247r3](https://mentor.ieee.org/802.11/dcn/21/11-21-0247-03-00be-bandwidthindicationinrtsctsin320mhzppduandpuncturedpreambles.pptx) BW Ind. In Rts/Cts In 320 MHz Ppdu & Punc. Preambles Brian Hart
  + [923r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0923-00-00be-11be-spectral-mask-floor.pptx) 11be spectral mask floor Xiaogang Chen

**PDTs**

[**783r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0783-00-00be-reference-correction-in-36-3-12-2-2.docx) **Reference correction in 36-3-12-2-2 (Genadiy Tsodik)**

36.3.12.2.2 contains a wrong reference. The correct reference is to a VHT section. Text modification is proposed.

Discussion

C: agree with change, but already fixed in D1.0.

No action needed.

[**916r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0916-00-00be-pdt-additional-corrections-to-the-trigger-frame-ru-allocation-table.docx) **PDT Add.l. Corrections to the TF RU Allocation Table (Steve Shellhammer)**

Two separate issues with the RU allocation table. A resolution is proposed for each issue.

Small updates needed after discussion. R1 will be reviewed later.

SP2: Do you agree to accept the proposed text modifications in 11-21/916r1 for the next draft of 802.11be?

No objection

[**907r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0907-01-00be-pdt-note-in-trigger-frame-ru-allocation-table.docx) **PDT NOTE in Trigger Frame RU Allocation Table (Mengshi Hu)**

Not all MRU indices are defined for all BWs. A note in Table 9-29j1 is proposed to clarify this.

SP1: Do you agree to accept the proposed text modifications in 11-21/907r1 for the next draft of 802.11be?

No objection

[**886r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0886-00-00be-proposed-changes-to-sounding-fb.docx) **Proposed changes to sounding FB (Xiaogang Chen)**

Two issues:

* Partial DL MU-MIMO is optional; however Partial BW MU feedback is mandatory. Changes are proposed to make this consistent, by making Partial BW MU feedback conditional mandatory.
* Definition for full BW and partial BW is not fully clear. Better definitions are proposed.

Discussion: Further clarification needed on meaning of “available bandwidth” and the definitions of full and partial BW.

Author will produce new version and continue discussion offline.

SP deferred.

**Technical Submissions**

[**247r3**](https://mentor.ieee.org/802.11/dcn/21/11-21-0247-03-00be-bandwidthindicationinrtsctsin320mhzppduandpuncturedpreambles.pptx) **BW Ind. In Rts/Cts In 320 MHz Ppdu & Punc. Preambles (Brian Hart)**

Indication for ≥320 MHz non-HT duplicate PPDUs in 6 GHz now uses bit 7 in the Service field

No protection was defined for that bit (no Parity, CRC, etc).

The submission discusses the anticipated needs for the number of bits to indicate the various BW modes and looks at different ways of communicating and providing FEC protection for these bits.

Discussion of the proposal will continue next call.

**Adjourn**

Meeting is adjourned at 21:00 ET.

**Thursday June 17th, 2021 10:00 – 12:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 AM ET.
2. The Chair follows the agenda in 11-21/785r17
3. The Chair goes through the IPR policy and asks if anyone is aware of any potentially essential patents. Nobody speaks up.
4. The Chair goes through the Copyright policy.
5. The Chair reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (MaxLinear) or the Chair himself if unable to record attendance via IMAT system.
6. Announcements:
7. Agenda

* Technical Submissions**: PDTs**
  + 886r2 Proposed changes to sounding FB Xiaogang Chen
* Technical Submissions:
  + [618r3](https://mentor.ieee.org/802.11/dcn/21/11-21-0618-03-00be-evm-and-sfo-sto.pptx) EVM and SFO/STO Brian Hart
  + [923r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0923-01-00be-11be-spectral-mask-floor.pptx) 11be spectral mask floor Xiaogang Chen
  + [368r4](https://mentor.ieee.org/802.11/dcn/21/11-21-0368-04-00be-diversity-enhancement-for-dup-mode.pptx) Diversity Enhancement for DUP mode Ali Tugberk Dogukan

**Attendance**

* Abdelrahman Abushattal (Istanbul Medipol University ;Vestel)
* Iyad Al Falujah (On Semiconductor)
* Gary Anwyl (Mediatek Inc.)
* Kwok Shum Au (Huawei Technologies Co., Ltd)
* Mehmet Aygul (Vestel)
* David Barr (Maxlinear)
* Albert Bredewoud (Broadcom Corporation)
* Jinsoo Choi (Lg Electronics)
* Jinyoung Chun (Lg Electronics)
* Thomas Derham (Broadcom Corporation)
* Ali Dogukan (Vestel)
* Ruchen Duan (Samsung)
* Shuling Feng (Mediatek Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Brian Hart (Cisco Systems, Inc.)
* Hung-Tao Hsieh (Mediatek Inc.)
* Shengquan Hu (Mediatek Inc.)
* Lei Huang (Guangdong Oppo Mobile Telecommunications Corp.,Ltd)
* Ahmed Ibrahim (Samsung Research America)
* Mahmoud Kamel (Interdigital, Inc.)
* Myeong-Jin Kim (Samsung)
* Youhan Kim (Qualcomm Incorporated)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Technologies, Inc.)
* Dong Guk Lim (Lg Electronics)
* Li Ma (Mediatek Inc.)
* Ebubekir Memisoglu (Istanbul Medipol University; Vestel)
* Leo Montreuil (Broadcom Corporation)
* Ashley Moran (Ieee Standards Association (Ieee-Sa))
* Yujin Noh (Senscomm)
* Basak Ozbakis (Vestel)
* Saju Palayur (Maxlinear Inc)
* Eunsung Park (Lg Electronics)
* Saira Rafique (Istanbul Medipol University ; Vestel)
* Oded Redlich (Huawei Technologies Co., Ltd)
* Sayak Roy (Nxp Semiconductors)
* Sigurd Schelstraete (Maxlinear)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei Technologies Co., Ltd)
* Robert Sosack (Molex Incorporated)
* Jung Hoon Suh (Huawei Technologies Co., Ltd)
* Bo Sun (Zte Corporation)
* Genadiy Tsodik (Huawei Technologies Co., Ltd)
* Allert Van Zelst (Qualcomm Incorporated)
* Prabodh Varshney (Nokia)
* Sameer Vermani (Qualcomm Incorporated)
* Dong Wei (Nxp Semiconductors)
* Kanke Wu (Qualcomm Incorporated)
* Tianyu Wu (Apple, Inc.)
* Yan Xin (Huawei Technologies Co., Ltd)
* Christopher Young (Broadcom Corporation)
* Salah Eddine Zegrar (Istanbul Medipol University; Vestel)
* Yan Zhang (Nxp Semiconductors)

**PDTs**

**886r2 Proposed changes to sounding FB (Xiaogang Chen)**

Updated based on comments received during last call.

Clarified definition of full BW and available BW.

Minor changes – updated to R3.

SP#1:

Do you agree to accept the proposed text modifications in 11-21/886r3 for the next draft of 802.11be?

No objections

**Technical Submissions:**

**618r3 EVM and SFO/STO (Brian Hart)**

Submission argues that we need more details on how EVM should be measured and specifically how the test equipment should be described. A number of options are proposed.

Discussion

Q: analysis is based on one-time correction for SFO?

A: yes

Q: how much text needed in the spec?

A: current text is rather specific on how to use CPE.

Q: Tx may implement 2 LO’s if there is a single phase tracking at the Rx. Not clear why we need to discuss STO. Option 1 is the best. It’s up to TE vendors. Don’t fix if it isn’t broken. No need to do it in 11be.

A: we can deal with it in 11me. What’s in the standard is not good enough for TE vendors sometimes.

Q: standard doesn’t specify receiver. This discussion is about testing. Probably tracking will be enabled in real implementations. Should be allowed for test equipment.

A: Test procedure should allow tracking.

C: there’s nothing that disallows it.

Q: SFO is the thing that should be compensated. That is included in step d. STO is not defined anywhere. TE have their own implementation. Prefer to discuss in 11me to cover all generations.

Q: Option 1 preferred. Actual Rx has no problem with this. TE implementation will not be worse than actual receiver. Expect them to do reasonable thing. So far, no issues have been seen with TE.

A: it works despite the language in 802.11, not because of it. OK with existing text.

SP#2

* **If we were to change the text from D0.4, vote Y/N/A on each of the following:**
  + Option 0a: CPE estimation and CPE and STO compensation during EHTLTFs and Data field, every OFDM symbol

Y/N/A: 7/17/22

SP#3

* **If we were to change the text from D0.4, vote Y/N/A on each of the following:**
  + Option 1: Revert EVM text changes in 20/1958r3, then change “estimate the phase” to “estimate a single phase” for the EHTLTF and Data fields

Y/N/A: 28/4/16

**923r1 11be spectral mask floor (Xiaogang Chen)**

The X dBm/MHz floor requirement in the PSD mask is too conservative. It never really takes effect unless for very low TX powers.

Considerations for changing the PSD floor …

* Regulatory (e.g. ETSI)
* Value in 5g/NR
* Coexistence

It is argued that the current values are too strict and should be relaxed.

SP#4

Do you agree that

For the transmit spectral mask, the absolute PSD floor is defined as a fixed value of -39 dBm/MHz.

This value doesn’t scale with the PPDU BW.

This value is applied to 5GHz and 6GHz band

Y/N/A: 32/1/7

**368r4 Diversity Enhancement for DUP mode (Ali Tugberk Dogukan)**

Deferred due to lack of time

**Adjourn**

Meeting is adjourned at 11:57 ET.