IEEE P802.11
Wireless LANs

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| Minutes 802.11 be PHY ad hoc Telephone Conferences, January - March 2021 |
| Date: 2021-01-21 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Sigurd Schelstraete | ON Semiconductor |  |  | sigurd.schelstraete@onsemi.com |

Abstract

This document contains the PHY ad hoc meeting minutes for TGbe teleconferences held at the following dates:

* Jan 21, 2021 (R0)
* Jan 25, 2021 (R1)
* Jan 28, 2021 (R2)
* Feb 4, 2021 (R3)
* Feb 8, 2021 (R4)
* Feb 22, 2021 (R5)

**Thursday Jan 21st 2021, 10:00 – 12:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 ET.
2. The Chair follows the agenda in 11-20/1917r10.
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 reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself if unable to record attendance via IMAT system.
5. Agenda for the meeting is discussed and approved

**Agenda**

* Technical Submissions: **Run SPs from Previous Topics**
	+ *No Pending Requests*
* Technical Submissions: **Proposed Draft Text (PDTs) for fixings TBDs**
	+ [104r2](https://mentor.ieee.org/802.11/dcn/21/11-21-0104-00-00be-subcarriers-and-resource-allocation-for-multiple-rus-update.docx) PDT Subcarriers and Resource Allocation for Multiple RUs Update Jianhan Liu

* + [114r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0114-01-00be-pdt-updates-on-ltf.docx) PDT updates on LTF Chenchen Liu
* Technical Submissions:
	+ [0089r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0089-01-00be-eht-ppe-thresholds-field-follow-up.pptx) EHT PPE Thresholds Field Follow-up Mengshi Hu
	+ [0102r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0102-00-00be-considerations-on-capabilities-and-operation-mode-mu-mimo.pptx) Considerations on Capabilities and Operation Mode: MU-MIMO Wook Bong Lee
	+ [129r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0129-00-00be-phase-rotation-for-320-mhz-non-ht-duplicate-transmission-and-pre-eht-modulated-fields.pptx) Phase Rotation for 320 MHz Non-HT Duplicate Transmission and Pre-EHT modulated Fields Chenchen LIU
	+ [130r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0130-00-00be-papr-comparison-for-two-320mhz-phase-rotation-sequences.pptx) PAPR Comparison for Two 320MHz Phase Rotation Sequences Eunsung Park

**Attendance**

The following people registered their attendance for the meeting:

* Gary Anwyl (Mediatek Inc.)
* Hari Ram B (Nxp Semiconductors)
* Jinsoo Choi (Lg Electronics)
* John Coffey (Realtek Semiconductor Corp.)
* Ruchen Duan (Samsung)
* Shuling Feng (Mediatek Inc.)
* Zhigang Gao (Cisco Systems, Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Brian Hart (Cisco Systems, Inc.)
* Lili Hervieu (Cable Television Laboratories Inc. (Cablelabs))
* Hung-Tao Hsieh (Mediatek Inc.)
* Mohsen Jamalabdollahi (Cisco Systems, Inc.)
* Mahmoud Kamel (Interdigital, Inc.)
* Assaf Kasher (Qualcomm Incorporated)
* Youhan Kim (Qualcomm Incorporated)
* James Lansford (Qualcomm Incorporated)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (Lg Electronics)
* Der-Zheng Liu (Realtek Semiconductor Corp.)
* Jianhan Liu (Mediatek Inc.)
* Mikael Lorgeoux (Canon Research Centre France)
* Lily Lv (Huawei Technologies Co. Ltd)
* Li Ma (Mediatek Inc.)
* Ebubekir Memisoglu (Istanbul Medipol University; Vestel)
* Leo Montreuil (Broadcom Corporation)
* Basak Ozbakis (Vestel)
* Eunsung Park (Lg Electronics)
* Srinath Puducheri (Broadcom Corporation)
* Oded Redlich (Huawei)
* Sigurd Schelstraete (On Semiconductor)
* Ankit Sethi (Nxp Semiconductors)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bo Sun (Zte Corporation)
* Tao Tian (Unisoc Comm.)
* Prabodh Varshney (Nokia)
* Daniel Verenzuela (Sony Corporation)
* Sameer Vermani (Qualcomm Incorporated)
* Leif Wilhelmsson (Ericsson Ab)
* Tianyu Wu (Apple, Inc.)
* Yan Xin (Huawei Technologies Co., Ltd)
* Steve Ts Yang (Mediatek Inc.)
* Jian Yu (Huawei Technologies Co., Ltd)
* Yan Zhang (Nxp Semiconductors)

**Proposed Draft Text (PDTs)**

**104r2 PDT Subcarriers and Resource Allocation for Multiple RUs Update (Jianhan Liu)**

Submission is presented and discussed. Based on discussion, the authors will provide an update. No SP is run at this time. Target is to SP this submission on the next call.

**114r1 PDT updates on LTF (Chenchen Liu)**

Submission is presented and discussed. Author will make updates accordingly. To be revisited on the next call.

**Presentations**

**0089r1 EHT PPE Thresholds Field Follow-up (Mengshi Hu)**

This submission discusses extensions of the PPE Threshold indication mechanism to cover new RU, MCS and N\_SS cases. Two options are proposed for EHT PPE Threshold field design.

Discussion

Q: 20usec use requires N\_SS > 8?

A: yes

Q: different implementations may have different bottlenecks. Option 2 has some restrictions. Will make some cases hard to signal.

A: will never be worse than 11ax. Option 1 is more flexible, Option 2 saves overhead.

SPs deferred

**0102r0 Considerations on Capabilities and Operation Mode: MU-MIMO (Wook Bong Lee)**

The submission reports some test results for HE, comparing various MU configurations with different MCS and different N\_SS,total. Sometimes reducing total number of streams in MU helps improve throughput.

11ax does not distinguish between SU and MU for supported NSS and MCS level. It is proposed to have two different set of Supported NSS and MCS level and allow that separate Rx NSS for MU can be updated by e.g. OMI.

Discussion

Q: MCS level might be different between SU and MU, don’t see it as capability issue, but rather Rate Adaptation issue. Don’t see the need for capability indication. Also, STA does not need to dictate the number of streams.

A: in the field, we use capabilities to control behavior as well

Q: STA should not decide parameters for other links. This could punish a good implementation AP.

Q: performance could also be limited by MIMO detection algorithm. Agree in principle with the proposal. Capabilities may take a lot of bytes.

A: max 3 bytes more.

Q: This is about HW capability vs. rate adaptation. Shouldn’t mix the two. Not really necessary to have separate capabilities. Is this similar to closed loop MCS feedback?

A: capability indication is static, OMI not.

SPs deferred

**Adjourn**

The meeting is adjourned 12:00 ET

**Monday Jan 25th 2021, 10:00 – 12:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 ET.
2. The Chair follows the agenda in 11-20/1917r11.
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 reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself if unable to record attendance via IMAT system.
5. Agenda for the meeting is discussed and approved

**Agenda**

* Run SPs from Previous Topics
	+ *Pending Requests*
* Proposed Draft Text (PDTs) for fixings TBDs
	+ [1958r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1958-02-00be-pdt-phy-phase-noise-per-160mhz.docx) PDT-PHY-Phase-Noise-Per-160MHz Brian Hart
	+ [104r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0104-00-00be-subcarriers-and-resource-allocation-for-multiple-rus-update.docx) PDT Subcarriers and Resource Allocation for Multiple RUs Update Jianhan Liu
	+ [114r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0114-01-00be-pdt-updates-on-ltf.docx) PDT updates on LTF Chenchen Liu
	+ [139r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0139-00-00be-pdt-phy-eht-dup-mode.docx) EHT DUP mode Srinath Puducheri
	+ 140 PDT-EHT-preamble-EHT-SIG-for-D04 Ross Yu
	+ 143 PDT-EHT-SIG-MCS-Table Ross Yu
* Technical Submissions:
	+ [~~0102r0~~](https://mentor.ieee.org/802.11/dcn/21/11-21-0102-00-00be-considerations-on-capabilities-and-operation-mode-mu-mimo.pptx) ~~Considerations on Capabilities and Operation Mode: MU-MIMO Wook Bong Lee~~
	+ [129r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0129-00-00be-phase-rotation-for-320-mhz-non-ht-duplicate-transmission-and-pre-eht-modulated-fields.pptx) Phase Rotation for 320 MHz Non-HT Duplicate Transmission and Pre-EHT modulated Fields Chenchen LIU
	+ [130r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0130-00-00be-papr-comparison-for-two-320mhz-phase-rotation-sequences.pptx) PAPR Comparison for Two 320MHz Phase Rotation Sequences Eunsung Park
	+ 93r1 Reducing USIG PAPR via Disregard Bit Value (Shimi Shilo)

**Attendance**

The following people registered their attendance for the meeting:

* Song-Haur An (Independent)
* Kwok Shum Au (Huawei Technologies Co.,  Ltd)
* Hari Ram B (Nxp Semiconductors)
* Andreas Bluschke (Signify)
* Jinsoo Choi (Lg Electronics)
* Seungho Choo (Senscomm Semiconductor Co., Ltd.)
* Jinyoung Chun (Lg Electronics)
* Zhigang Gao (Cisco Systems, Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Brian Hart (Cisco Systems, Inc.)
* Hung-Tao Hsieh (Mediatek Inc.)
* Lei Huang (Guangdong Oppo Mobile Telecommunications Corp.,Ltd)
* Mohsen Jamalabdollahi (Cisco Systems, Inc.)
* Eunsung Jeon (Samsung Electronics)
* Mahmoud Kamel (Interdigital, Inc.)
* Youhan Kim (Qualcomm Incorporated)
* Hong Won Lee (Lg Electronics)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (Lg Electronics)
* Taesung Lim (Lg Electronics)
* Wei Lin (Huawei Technologies Co. Ltd)
* Der-Zheng Liu (Realtek Semiconductor Corp.)
* Mikael Lorgeoux (Canon Research Centre France)
* Li Ma (Mediatek Inc.)
* Leo Montreuil (Broadcom Corporation)
* Eunsung Park (Lg Electronics)
* Sigurd Schelstraete (On Semiconductor)
* Ankit Sethi (Nxp Semiconductors)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bo Sun (Zte Corporation)
* Bin Tian (Qualcomm Incorporated)
* Genadiy Tsodik (Huawei Technologies Co. Ltd)
* Allert Van Zelst (Qualcomm Incorporated)
* Prabodh Varshney (Nokia)
* Daniel Verenzuela (Sony Corporation)
* Leif Wilhelmsson (Ericsson Ab)
* Tianyu Wu (Apple, Inc.)
* Yan Xin (Huawei Technologies Co., Ltd)
* Steve Ts Yang (Mediatek Inc.)
* Homin Yoo (Lg Electronics)
* Jeonghwan Yoon (Lg Electronics)
* Jian Yu (Huawei Technologies Co., Ltd)
* Malia Zaman (Ieee Standards Association (Ieee-Sa))
* Yan Zhang (Nxp Semiconductors)

**Proposed Draft Text (PDTs)**

[**1958r2**](https://mentor.ieee.org/802.11/dcn/20/11-20-1958-02-00be-pdt-phy-phase-noise-per-160mhz.docx) **PDT-PHY-Phase-Noise-Per-160MHz (Brian Hart)**

Proposal to accept TBD text that mentions the possibility of 2 LO implementation of 320 MHz.

Discussion:

Q: better to write something in EVM section, Tx being responsible for meeting the requirement.

A: can be added in modulation accuracy section. Additional text referencing EVM section is proposed.

Q: text is confusing. Not even sure we need this. You still want receiver to consider 2 LOs, even without this text.

A: Tx has to achieve all Tx requirements. No obligation on Rx side.

Q: probably should not mention one or two LOs. Rx can assume there are no phase differences. This simplifies the design. Compromise: don’t mention number of LO’s at Tx side. At Rx side, assume there is no phase difference.

A: the proposal is exactly like in 11ac/11ax

Document will be updated offline. SP deferred.

[**104r3**](https://mentor.ieee.org/802.11/dcn/21/11-21-0104-00-00be-subcarriers-and-resource-allocation-for-multiple-rus-update.docx) **PDT Subcarriers and Resource Allocation for Multiple RUs Update (Jianhan Liu)**

Two issues discussed during last call are addressed here.

No Discussion

SP1

Do you agree to accept the proposed text in 11-21/104r3 for 11be D0.4?

No objections

Accepted by unanimous consent

[**114r3**](https://mentor.ieee.org/802.11/dcn/21/11-21-0114-01-00be-pdt-updates-on-ltf.docx) **PDT updates on LTF (Chenchen Liu)**

Modified to 114r4 based on discussion

SP2

Do you agree to accept the proposed text in 11-21/114r4 for 11be D0.4?

No objections

Accepted by unanimous consent

[**139r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0139-00-00be-pdt-phy-eht-dup-mode.docx) **EHT DUP mode (Srinath Puducheri)**

Create new section for EHT-DUP. Existing text removed from Constellation mapping section.

Discussion will be continued next meeting.

**Adjourn**

The meeting is adjourned 12:00 ET

**Thursday Jan 28th 2021, 19:00 – 22:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 19:00 ET.
2. The Chair follows the agenda in 11-20/1917r15.
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 reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself if unable to record attendance via IMAT system.
5. Agenda for the meeting is discussed and approved

**Agenda**

* Technical Submissions: **Run SPs from Previous Topics**
	+ *Pending Requests*
* Technical Submissions: **Proposed Draft Text (PDTs) for fixings TBDs**
	+ [139r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0139-01-00be-pdt-phy-eht-dup-mode.docx) EHT DUP mode Srinath Puducheri

* + [1958r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1958-03-00be-pdt-phy-phase-noise-per-160mhz.docx) PDT-PHY-Phase-Noise-Per-160MHz Brian Hart
	+ [140r2](https://mentor.ieee.org/802.11/dcn/21/11-21-0140-02-00be-pdt-eht-preamble-eht-sig-for-d04.docx) EHT-preamble-EHT-SIG-for-D04 Ross Jian Yu
	+ [143r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0143-01-00be-pdt-eht-sig-mcs-table.docx) EHT-SIG-MCS-Table Ross Jian Yu
	+ [153r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0153-00-00be-pdt-tbd-phy-parameters-for-eht-mcss.docx) PDT-TBD PHY Parameters for EHT MCSs Yujin Noh
* Technical Submissions:
	+ [129r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0129-01-00be-phase-rotation-for-320-mhz-non-ht-duplicate-transmission-and-pre-eht-modulated-fields.pptx) Phase Rot. 4 320 MHz Non-HT Dup TX and Pre-EHT modulated Fields Chenchen LIU
	+ [130r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0130-00-00be-papr-comparison-for-two-320mhz-phase-rotation-sequences.pptx) PAPR Comparison for Two 320MHz Phase Rotation Sequences Eunsung Park
	+ [0093r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0093-01-00be-reducing-usig-papr-via-disregard-bit-value.pptx) Reducing USIG PAPR via Disregard Bit Value Shimi Shilo

**Attendance**

The following people registered their attendance for the meeting:

* Gary Anwyl (Mediatek Inc.)
* Kwok Shum Au (Huawei Technologies Co.,  Ltd)
* Hari Ram B (Nxp Semiconductors)
* Christy Bahn (IEEE Staff)
* Eugene Baik (Qualcomm Incorporated)
* Rui Cao (Nxp Semiconductors)
* Jinsoo Choi (LG Electronics)
* Jinyoung Chun (LG Electronics)
* Ruchen Duan (Samsung)
* Shuling Feng (Mediatek Inc.)
* Zhigang Gao (Cisco Systems, Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Niranjan Grandhe (NXP Semiconductors)
* Brian Hart (Cisco Systems, Inc.)
* Hung-Tao Hsieh (Mediatek Inc.)
* Mengshi Hu (Huawei)
* Mohsen Jamalabdollahi (Cisco Systems, Inc.)
* Eunsung Jeon (Samsung Electronics)
* Mahmoud Kamel (Interdigital, Inc.)
* Youhan Kim (Qualcomm Incorporated)
* James Lansford (Qualcomm Incorporated)
* Hong Won Lee (LG Electronics)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (LG Electronics)
* Taesung Lim (LG Electronics)
* Der-Zheng Liu (Realtek Semiconductor Corp.)
* Li Ma (Mediatek Inc.)
* Jun Minotani (Panasonic Corporation)
* Thomas Pare (Mediatek Inc.)
* Eunsung Park (LG Electronics)
* Srinath Puducheri (Broadcom Corporation)
* Oded Redlich (Huawei)
* Sigurd Schelstraete (On Semiconductor)
* Ankit Sethi (NXP Semiconductors)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Paul Strauch (Qualcomm Incorporated)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bin Tian (Qualcomm Incorporated)
* Tao Tian (Unisoc Comm.)
* Prabodh Varshney (Nokia)
* Sameer Vermani (Qualcomm Incorporated)
* Kanke Wu (Qualcomm Incorporated)
* Tianyu Wu (Apple, Inc.)
* Rui Yang (Interdigital, Inc.)
* Homin Yoo (LG Electronics)
* Jeonghwan Yoon (LG Electronics)
* Jian Yu (Huawei Technologies Co., Ltd)
* Yan Zhang (NXP Semiconductors)

**Proposed Draft Text (PDTs)**

[**139r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0139-01-00be-pdt-phy-eht-dup-mode.docx) **EHT DUP mode (Srinath Puducheri)**Additional changes related to EHT-DUP.

Discussion:

Q: should this be defined only for LPI?

A: not clear what LPI means in IEEE

SP1

Do you agree to accept the proposed text in 11-21/139r2 for 11be D0.4?

No objections

Accepted by unanimous consent

**1958r3 PDT-PHY-Phase-Noise-Per-160MHz (Brian Hart)**

Updated based on Monday’s discussion.

Discussion

None

SP2

Do you agree to accept the proposed text in 11-21/1958r3 for 11be D0.4?

No objections

Accepted by unanimous consent

[**140r2**](https://mentor.ieee.org/802.11/dcn/21/11-21-0140-02-00be-pdt-eht-preamble-eht-sig-for-d04.docx) **EHT-preamble-EHT-SIG-for-D04 (Ross Jian Yu)**

Discussion

None

SP3

Do you agree to accept the proposed text in 11-21/0140r2 for 11be D0.4?

No objections

Accepted by unanimous consent

[**143r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0143-01-00be-pdt-eht-sig-mcs-table.docx) **EHT-SIG-MCS-Table (Ross Jian Yu)**

Discussion

None

SP4

Do you agree to accept the proposed text in 11-21/0143r2 for 11be D0.4?

No objections

Accepted by unanimous consent

[**153r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0153-00-00be-pdt-tbd-phy-parameters-for-eht-mcss.docx) **PDT-TBD PHY Parameters for EHT MCSs (Yujin Noh)**

Discussion

Q: MCS-14 is not included?

A: MCS-14 has a separate table and is covered by another document.

SP5

Do you agree to accept the proposed text in 11-21/0153r0 for 11be D0.4?

No objections

Accepted by unanimous consent

**Technical submissions**

[**129r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0129-01-00be-phase-rotation-for-320-mhz-non-ht-duplicate-transmission-and-pre-eht-modulated-fields.pptx) **Phase Rot. 4 320 MHz Non-HT Dup TX and Pre-EHT modulated Fields (Chenchen Liu)**

Three sets of rotation coefficients are evaluated for Non-HT duplicate transmission and pre-EHT modulated filed under various preamble puncture pattern.

New set of coefficients is proposed.

Discussion

Q: how is case with two 160 MHz LOs modeled?

A: maximum of two 160 MHz segments

Q: request to defer SP

Q: phase rotation applies from L-STF to EHT-SIG? L-LTF is used for channel estimation. Receiver doesn’t need to know the sequence.

A: may be needed for channel smoothing.

Q: have you compared with PAPR for regular EHT data?

A: median value of data is less than 10 dB

Q: rotation per 20 MHz is absorbed into the channel. No need to specify.

SP deferred

[**130r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0130-00-00be-papr-comparison-for-two-320mhz-phase-rotation-sequences.pptx) **PAPR Comparison for Two 320MHz Phase Rotation Sequences (Eunsung Park)**

Argues that we need to keep the agreed 320MHz phase rotation for pre-EHT modulated fields. It is

also proposed that the agreed phase rotation sequence is applied to all of the fields of 320MHz non-HT Dup PPDU

SP already reflected in D0.3, so no need to run it.

[**0093r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0093-01-00be-reducing-usig-papr-via-disregard-bit-value.pptx) **Reducing USIG PAPR via Disregard Bit Value (Shimi Shilo)**

Changing the value of the Disregard bits can reduce the PAPR and improve the performance

Discussion

Q: interesting idea, especially for TB PPDU. For TB However, we just copy from Trigger frame.

A: some changes in D0.3 suggest it may be both ways.

Q: not the correct interpretation - there is no intention to not copy the bits. We can still define the bit values in the Trigger frame.

Q: Original idea of Disregard bits is to put limitations on receiver behavior. Will this cause future design to be less flexible?

A: main issue is that we have fixed values for a relatively large number of bits. In R2, this may not be the case anymore if the bits are actually used.

Q: can we just say that Disregard bits can be arbitrary?

A: cannot be arbitrary because they can be used in the next generation.

Q: if we define certain values for the Disregard bits, does this mean that for future versions we can not use the all-one pattern because it may cause PAPR issue?

A: in R2, the values will be different for different conditions, so no fixed pattern.

Q: did you consider al possible values, or just randomized

A: looked at all allowed values.

Q: based on existing spec? Only valid combinations?

A: all combinations were used. Doubt this would make a large difference.

**Adjourn**

The meeting is adjourned 22:00 ET

**Thursday Feb 4th 2021, 10:00 – 12:00 ET**

**Introduction**

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2. The Chair follows the agenda in 11-20/1919r15.
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4. The Chair reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself if unable to record attendance via IMAT system.
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	+ [112r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0112-00-00be-pdt-phy-update-to-eht-sounding-ndp.docx) PDT PHY Update to EHT Sounding NDP Sameer Vermani
	+ [193r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0193-00-00be-pdt-phy-transmit-requirements-for-ppdus-sent-in-response-to-a-triggering-frame.docx) Transmit-requirements-for-ppdus-sent-in-response-to-a-triggering-frame Mengshi Hu
	+ [0157r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0157-00-00be-pdt-effect-of-ch-bandwidth-parameter-on-ppdu-format.docx) PDT-Effect of CH\_BANDWIDTH parameter on PPDU format Yujin Noh
* Technical Submissions:
	+ [0093r2](https://mentor.ieee.org/802.11/dcn/21/11-21-0093-02-00be-reducing-usig-papr-via-disregard-bit-value.pptx) Reducing USIG PAPR via Disregard Bit Value Shimi Shilo
	+ [0191r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0191-00-00be-supported-bands-for-mcs14.pptx) Supported bands for MCS14 Ron Porat

**Attendance**

The following people registered their attendance for the meeting:

* Gary Anwyl (Mediatek Inc.)
* Kwok Shum Au (Huawei Technologies Co.,  Ltd)
* Jinsoo Choi (LG Electronics)
* Yanyi Ding (Panasonic Corporation)
* Shuling Feng (Mediatek Inc.)
* James Garringer (Apple, Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Hung-Tao Hsieh (Mediatek Inc.)
* Lei Huang (Guangdong Oppo Mobile Telecommunications Corp.,Ltd)
* Mohsen Jamalabdollahi (Cisco Systems, Inc.)
* Eunsung Jeon (Samsung Electronics)
* Mahmoud Kamel (Interdigital, Inc.)
* Youhan Kim (Qualcomm Incorporated)
* James Lansford (Qualcomm Incorporated)
* Hong Won Lee (LG Electronics)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (LG Electronics)
* Taesung Lim (LG Electronics)
* Chenchen Liu (Huawei Technologies Co., Ltd)
* Miguel Lopez (Ericsson Ab)
* Mikael Lorgeoux (Canon Research Centre France)
* Hui-Ling Lou (NXP Semiconductors)
* Li Ma (Mediatek Inc.)
* Ebubekir Memisoglu (Istanbul Medipol University; Vestel)
* Yujin Noh (Newracom Inc.)
* Basak Ozbakis (Vestel)
* Ozlem Ozden Zengin (Vestel)
* Burak Ozpoyraz (Vestel)
* Eunsung Park (LG Electronics)
* Oded Redlich (Huawei)
* Sigurd Schelstraete (ON Semiconductor)
* Firas Shaari (Comcast)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Robert Sosack (Molex Incorporated)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bo Sun (Zte Corporation)
* Genadiy Tsodik (Huawei Technologies Co. Ltd)
* Leif Wilhelmsson (Ericsson Ab)
* Kanke Wu (Qualcomm Incorporated)
* Yan Xin (Huawei Technologies Co., Ltd)
* Homin Yoo (LG Electronics)
* Jeonghwan Yoon (LG Electronics)
* Yan Zhang (NXP Semiconductors)

**Proposed Draft Text (PDTs)**

[**112r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0112-00-00be-pdt-phy-update-to-eht-sounding-ndp.docx) **PDT PHY Update to EHT Sounding NDP (Sameer Vermani)**

Address punctured NDPs.

Submission will be revised based on comments received during discussion.

SP deferred

[**193r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0193-00-00be-pdt-phy-transmit-requirements-for-ppdus-sent-in-response-to-a-triggering-frame.docx) **Transmit-requirements-for-ppdus-sent-in-response-to-a-triggering-frame (Mengshi Hu)**

Mimics HE requirements with appropriate changes.

SP1:

Do you accept proposed text in 11/193r1 for 11be Draft 0.4?

No objections

[**0157r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0157-00-00be-pdt-effect-of-ch-bandwidth-parameter-on-ppdu-format.docx) **PDT-Effect of CH\_BANDWIDTH parameter on PPDU format (Yujin Noh)**

Remove non-contiguous BW values.

Puncturing patterns and support need to be clarified further.

Submission will be revised based on comments received during discussion.

SP deferred

**Technical submissions**

[**0093r2**](https://mentor.ieee.org/802.11/dcn/21/11-21-0093-02-00be-reducing-usig-papr-via-disregard-bit-value.pptx) **Reducing USIG PAPR via Disregard Bit Value (Shimi Shilo)**

Follow-up from previous meeting.

Setting values of Disregard bits to reduce the PAPR of U-SIG. Updated results with only valid combinations of bits. Proposal is changed slightly as a result.

Proposal: set same disregard sequence for all PPDUs of certain type instead of optimizing for each case.

SP2:

* Do you support to set the default value of the Disregard bits in the U-SIG field of an EHT MU PPDU to ‘1 0 1 1 0’ (‘22’ in decimal)?
	+ This is for R1

Q: maybe there is another way to evaluate this, like changing position of the Disregard bits.

Q: more interested in higher BW PAPR. For 320 MHz, there is not much improvement. If you want to optimize for 320, we can optimize for each BW. Changing other bit values can also help.

A: there are other BW values that may be used more often.

Q: why not set arbitrary value?

A: not possible for TB PPDU.

Q: these bits could not longer be used to distinguish between R1 and R2 if they are arbitrary.

There is a long discussion on the appropriate use of Disregard bits. SP is not run due to lack of time.

SP deferred

**Adjourn**

The meeting is adjourned 12:00 ET

**Monday Feb 8th 2021, 10:00 – 12:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 ET.
2. The Chair follows the agenda in 11-20/1917r22.
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 reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself if unable to record attendance via IMAT system.
5. Agenda for the meeting is discussed and approved

**Agenda**

* Comment Assignment/Review
	+ [223](https://mentor.ieee.org/802.11/dcn/21/11-21-0223-00-00be-ieee-802-11be-cc34-comments.xlsx) IEEE 802.11be CC34 comments (PHY Tab)
* Technical Submissions: **Run SPs from Previous Topics**
	+ *Pending Requests*
* Technical Submissions: **Proposed Draft Text (PDTs) for fixings TBDs**
	+ [220r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0220-00-00be-pdt-eht-preamble-eht-sig-for-d0-4-part-2.docx) EHT-preamble-EHT-SIG for D0.4 - part 2 Ross Jian Yu
	+ [224r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0224-00-00be-pdt-eht-phy-capabilities-information-field.docx) PDT EHT PHY Capabilities Information Field Steve Shellhammer
* Technical Submissions:
	+ [0191r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0191-00-00be-supported-bands-for-mcs14.pptx) Supported bands for MCS14 Ron Porat
	+ [0208r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0208-01-00be-simplified-eht-ppe-thresholds-field.pptx) Simplified EHT PPE Thresholds Field Mengshi Hu
	+ [225r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0225-00-00be-eht-ppet-capability-design.pptx) EHT PPET Capability Design Rui Cao

**Attendance**

The following people registered their attendance for the meeting:

* Gary Anwyl (Mediatek Inc.)
* Kwok Shum Au (Huawei Technologies Co.,  Ltd)
* Hari Ram B (NXP Semiconductors)
* Eugene Baik (Qualcomm Incorporated)
* Shuling Feng (Mediatek Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Hung-Tao Hsieh (Mediatek Inc.)
* Lei Huang (Guangdong Oppo Mobile Telecommunications Corp.,Ltd)
* Mohsen Jamalabdollahi (Cisco Systems, Inc.)
* Mahmoud Kamel (Interdigital, Inc.)
* Myeong-Jin Kim (Samsung)
* Youhan Kim (Qualcomm Incorporated)
* James Lansford (Qualcomm Incorporated)
* Hong Won Lee (Lg Electronics)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (Lg Electronics)
* Ebubekir Memisoglu (Istanbul Medipol University; Vestel)
* Leo Montreuil (Broadcom Corporation)
* Thomas Pare (Mediatek Inc.)
* Eunsung Park (Lg Electronics)
* Oded Redlich (Huawei)
* Sayak Roy (NXP Semiconductors)
* Sigurd Schelstraete (ON Semiconductor)
* Ankit Sethi (NXP Semiconductors)
* Firas Shaari (Comcast)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* 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)
* Kanke Wu (Qualcomm Incorporated)
* Yan Xin (Huawei Technologies Co., Ltd)
* Steve Ts Yang (Mediatek Inc.)
* Homin Yoo (Lg Electronics)
* Jeonghwan Yoon (Lg Electronics)
* Jian Yu (Huawei Technologies Co., Ltd)
* Malia Zaman (Ieee Standards Association (Ieee-Sa))
* Yan Zhang (NXP Semiconductors)

**PDT presentations**

[**220r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0220-00-00be-pdt-eht-preamble-eht-sig-for-d0-4-part-2.docx) **EHT-preamble-EHT-SIG for D0.4 - part 2 (Ross Jian Yu)**

Minor comments – document updated to R1.

SP1:

SP1 in 11-21/0220r1

Do you accept the proposed text in 11-21/220r1 for inclusion in 11be D0.4?

No objections to SP

[**224r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0224-00-00be-pdt-eht-phy-capabilities-information-field.docx) **PDT EHT PHY Capabilities Information Field (Steve Shellhammer)**

Document will be updated based on feedback received during discussion.

SP deferred

**CC34 comment assignment**

See 11-21/[0223](https://mentor.ieee.org/802.11/dcn/21/11-21-0223-00-00be-ieee-802-11be-cc34-comments.xlsx) IEEE 802.11be CC34 comments (PHY Tab) – Edward Au

All PHY comments have been assigned

**1935r2 TGbe Editor's Report (Edward Au)**

2409 comments received

Discussion

Q: is there a deadline for D0.4/D0.5?

A: D0.4 around March plenary

Q: do we expect to resolve these comments by Draft 1.0?

A: that is final deadline. Timeline to be further discussed in Joint call.

**Technical presentations**

[**0191r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0191-00-00be-supported-bands-for-mcs14.pptx) **Supported bands for MCS14 (Ron Porat)**

Is MCS14 allowed in the full 6 GHz band or only in LPI bands?

MCS 14 should be treated like any MCS, not limited in the spec. LPI does not have clear definition in spec.

Proposal to remove mention of LPI.

Discussion

Q: Beacon field already has country code, maybe that can be used.

Q: what is the use case for this DUP mode?

A: outside of scope here. Decision on use is implementation issue.

Q: isn’t LPI allowed in full 6 GHz?

A: Correct in US. LPI is not IEEE definition.

SP2:

SP1 in 11-21/0191r0

Do you agree to remove any mentioning of LPI in D0.3 and in PDT number 21/0139s?

Q: better rely on comment resolution to change the text. Is that intention of SP?

Q: 21/0139 will need an update.

Q: should this be clarified in SFD?

A: SFD is only for R2 features now.

Y/N/A: 27/2/12

**Adjourn**

Meeting is adjourned at 12:00 ET.

**Monday Feb 22nd 2021, 10:00 – 12:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 ET.
2. The Chair follows the agenda in 11-20/1917r25.
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 reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself if unable to record attendance via IMAT system.
5. Agenda for the meeting is discussed and approved

**Agenda**

* Technical Submissions: **Run SPs from Previous Topics**
	+ 129r3
* Technical Submissions: **Proposed Draft Text (PDTs) for fixings TBDs**
	+ [224r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0224-01-00be-pdt-eht-phy-capabilities-information-field.docx) EHT PHY Capabilities Information Field Steve Shellhammer
	+ [~~213r0~~](https://mentor.ieee.org/802.11/dcn/21/11-21-0213-00-00be-pdt-update-phy-beamforming.docx) ~~PDT-Update-PHY-Beamforming Genadiy Tsodik~~
* Technical Submissions: **Comment Resolutions**
	+ [235r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0235-00-00be-eht-sig-cr-d03-part-1.doc) EHT-SIG-CR-d03-part-1 Ross Jian Yu
	+ [236r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0236-00-00be-eht-sig-cr-d03-part-2.doc) EHT-SIG-CR-d03-part-2 Ross Jian Yu
	+ [273r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0273-00-00be-d0-3-cr-for-36-3-2-5.docx) D0.3 CR for 36.3.2.5 Eunsung Park
	+ [274r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0274-00-00be-d0-3-cr-for-36-3-11-9.docx) D0.3 CR for 36.3.11.9 Eunsung Park
* Technical Submissions:
	+ [208r2](https://mentor.ieee.org/802.11/dcn/21/11-21-0208-02-00be-simplified-eht-ppe-thresholds-field.pptx) Simplified EHT PPE Thresholds Field Mengshi Hu
	+ [225r1](https://mentor.ieee.org/802.11/dcn/21/11-21-0225-01-00be-eht-ppet-capability-design.pptx) EHT PPET Capability Design Rui Cao
	+ [241r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0241-00-00be-he-and-eht-phy-capability-dependencies.pptx) HE and EHT PHY Capability Dependencies Steve Shellhammer

**Attendance**

The following people registered their attendance for the call:

* Gary Anwyl (Mediatek Inc.)
* Hari Ram B (Nxp Semiconductors)
* Rui Cao (Nxp Semiconductors)
* Jinsoo Choi (Lg Electronics)
* Seungho Choo (Senscomm Semiconductor Co., Ltd.)
* Jinyoung Chun (Lg Electronics)
* Ruchen Duan (Samsung)
* Shuling Feng (Mediatek Inc.)
* Zhigang Gao (Cisco Systems, Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Brian Hart (Cisco Systems, Inc.)
* Hung-Tao Hsieh (Mediatek Inc.)
* Lei Huang (Guangdong Oppo Mobile Telecommunications Corp.,Ltd)
* Eunsung Jeon (Samsung Electronics)
* Mahmoud Kamel (Interdigital, Inc.)
* Myeong-Jin Kim (Samsung)
* Youhan Kim (Qualcomm Incorporated)
* James Lansford (Qualcomm Incorporated)
* Hong Won Lee (Lg Electronics)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (Lg Electronics)
* Taesung Lim (Lg Electronics)
* Wei Lin (Huawei Technologies Co. Ltd)
* Zinan Lin (Interdigital, Inc.)
* Der-Zheng Liu (Realtek Semiconductor Corp.)
* Jianhan Liu (Mediatek Inc.)
* Li Ma (Mediatek Inc.)
* Ebubekir Memisoglu (Istanbul Medipol University; Vestel)
* Khashayar Mirfakhraei (Cisco Systems, Inc.)
* Leo Montreuil (Broadcom Corporation)
* Ashley Moran (Ieee Standards Association (Ieee-Sa))
* Basak Ozbakis (Vestel)
* Thomas Pare (Mediatek Inc.)
* Eunsung Park (Lg Electronics)
* Oded Redlich (Huawei)
* Sayak Roy (Nxp Semiconductors)
* Sigurd Schelstraete (On Semiconductor)
* Ankit Sethi (Nxp Semiconductors)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bo Sun (Zte Corporation)
* Bin Tian (Qualcomm Incorporated)
* Genadiy Tsodik (Huawei Technologies Co. Ltd)
* Allert Van Zelst (Qualcomm Incorporated)
* Prabodh Varshney (Nokia)
* Sameer Vermani (Qualcomm Incorporated)
* Qi Wang (Huawei Technologies Co., Ltd)
* Chung Wu (Tp-Link Corporation Limited)
* Tianyu Wu (Apple)
* Yan Xin (Huawei Technologies Co., Ltd)
* Rui Yang (Interdigital, Inc.)
* Steve Ts Yang (Mediatek Inc.)
* Homin Yoo (Lg Electronics)
* Jian Yu (Huawei Technologies Co., Ltd)
* Yan Zhang (Nxp Semiconductors)

**Pending SPs**

**129r3 Phase Rotation for 320 MHz Non-HT Duplicate Transmission and Pre-EHT modulated Fields (**Chenchen Liu**)**

SP1:

SP1 in 129r4

* Do you support to add [1 -1 -1 -1, 1 -1 -1 -1, 1 -1 -1 -1, -1 1 1 1] as an additional phase rotation option for 320M Non-HT Duplicate transmission and the pre-EHT modulated field of 320 MHz EHT transmission?
	+ The transmitter can determine which one to use itself
	+ The per 80 MHz phase rotation is fixed as [1 -1 -1 -1]. The Tx can multiply additional phase rotation, +1 or -1, for each 80 MHz. The two examples are given by the existing one and the one given in this SP.

Y/N/A: 31/8/9

**Technical submissions**

[**241r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0241-00-00be-he-and-eht-phy-capability-dependencies.pptx) **HE and EHT PHY Capability Dependencies (Steve Shellhammer)**

Simplify EHT PHY Capabilities table by reusing HE PHY Capabilities where possible.

SP2:

SP1 in 241r1

Do you agree that,

* There are no capability bits in the EHT PHY Capabilities Information field to indicate support for 40, 80 or 160 MHz channel width
* Support for 40, 80 or 160 MHz channel width is the same for HE PPDUs and EHT PPDU in an EHT STA, and is indicated by the HE PHY Capabilities Information field
* An EHT STA supporting 320 MHz channel width in the 6 GHz band shall set the 160 MHz support in HE channel width

Y/N/A: 37/0/7

SP3:

SP2 in 241r1

Do you agree that,

* There is no capability bit in the EHT PHY Capabilities Information field to indicate Device Class
* An EHT STA supports the same Device class in HE and EHT TB PPDUs?

Y/N/A: 32/0/6

SP4:

SP3 in 241r1

* Do you agree that,
	+ There is no capability bit in the EHT PHY Capabilities Information field to indicate support for LDPC
	+ The LDPC capability bit in the HE PHY Capabilities Information field indicates LDPC support in both HE and EHT PPDUs
* Note: In EHT this only applies to 20 MHz-only STAs, since LDPC is mandatory for BW $\geq $ 40 MHz

Y/N/A: 38/0/1

**PDT submissions**

[**224r1**](https://mentor.ieee.org/802.11/dcn/21/11-21-0224-01-00be-pdt-eht-phy-capabilities-information-field.docx) **EHT PHY Capabilities Information Field (Steve Shellhammer)**

Incorporates the proposals in 241r1.

Updated to 224r1

SP5:

Do you accept the proposed text in 11-21/224r1 for 11be D0.4?

No objection

**Comment Resolution**

[**235r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0235-00-00be-eht-sig-cr-d03-part-1.doc) **EHT-SIG-CR-d03-part-1 (Ross Jian Yu)**

SP6:

Do you accept the proposed CR for the following CIDs in 11-21/0235r1?

* CID 1377, 1378, 1622, 1970, 3049, 3184, 3185, 3293, 3294

No objection

**Adjourn**

The meeting is adjourned at 12:00 ET