IEEE P802.11  
Wireless LANs

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| Minutes 802.11 be PHY ad hoc Telephone Conferences,  September - November 2020 | | | | |
| Date: 2020-09-14 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Sigurd Schelstraete | ON Semiconductor |  |  | Sigurd.schelstraete@onsemi.com |
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Abstract

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

* Sept 14, 2020 (R0)
* Sept 21, 2020 (R1)

**Monday Sept 14th, 2020 19:00 – 21:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 19:00 ET.
2. The Chair follows the agenda in 11-20/1269r3
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 sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself.
5. Announcements: None
6. PDT Status for R1 PHY features:

* PDT Status for R1 PHY features:

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| **Not Uploaded** | **Uploaded** | **And Presented** | **And Passed StrawPoll** |
| Xiaogang (T-Block)  Sameer (U-SIG)  Dandan (EHT LTF)  Chenchen (Scrambler)  Sameer (EHT sound. NDP)  Xiaogang (T-mask & S-flat)  Bin (CCA sens)  Xiaogang (TX procedure)  Xiaogang (RX procedure) | 1307, 1338, 1339, 1337, 1319, 1351, 1403, 1404, 1340, 1447, 1448 | 1276, 1315, 1290, 1371. | [1293r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1293-01-00be-pdt-phy-scope-and-eht-phy-functions.docx), [1295r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1295-01-00be-pdt-phy-overview-of-the-ppdu-enconding-process.docx), [1160r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1160-04-00be-pdt-phy-mu-mimo.docx), [1327r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1327-01-00be-pdt-eht-ppdu-format.docx), [1153r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1153-03-00be-pdt-phy-timing-related-parameters.docx), [1260r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1260-04-00be-pdt-phy-eht-stf.docx), [1349r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1349-03-00be-pdt-constellation-mapping.docx), [1231r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1231-03-00be-pdt-phy-beamforming.docx), [1252r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1252-02-00be-pdt-phy-frequency-tolerance.docx), [1253r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1253-06-00be-pdt-phy-modulation-accuracy.docx), [1254r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1254-06-00be-pdt-phy-receive-specification-general-and-receiver-minimum-input-sensitivity-and-channel-rejection.docx), [1229r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1229-03-00be-pdt-phy-channel-numbering-and-channelization.docx), [1294r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1294-04-00be-pdt-phy-eht-plme.docx), [1329r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1329-02-00be-pdt-eht-preamble-l-stf-l-ltf-l-sig-and-rl-sig.docx). |

1. Agenda:
   * **Technical Submissions: Proposed Draft Text (PDTs) [Discussions and SPs]**
     + [1290r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1290-02-00be-pdt-phy-parameters-for-eht-mcss.docx) Parameters-for-EHT-MCSs Yujin Noh [SP]
     + [1276r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1276-02-00be-pdt-phy-eht-preamble-eht-sig.docx) EHT-preamble-EHT-SIG Ross Jian Yu [SP]
     + [1315r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1315-01-00be-draft-text-for-support-for-large-bandwidth.docx) Support for large bandwidth Yan Xin [SP]
     + [1371r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1371-00-00be-pdt-phy-subcarriers-and-resource-allocation-for-wideband.docx) Subcarriers-and-resource-allocation-for-wideband Yan Xin [SP]
     + [1338r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1338-04-00be-pdt-phy-eht-modulation-and-coding-eht-mcss.docx) EHT Modulation and Coding (EHT-MCSs) Rethna Pulikkoonattu
     + [1339r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1339-04-00be-pdt-phy-data-field-coding.docx) Data-field-Coding Yan Zhang
     + [1337r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1337-01-00be-pdt-phy-mathematical-description-of-signals.docx) Mathematical description of signals Yan Zhang
     + [1340r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1340-01-00be-pdt-phy-packet-extension.docx) Packet Extension Yan Zhang
     + [1319r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1319-01-00be-pdt-phy-preamble-puncture.docx) Preamble-Puncture Oded Redlich
     + [1351r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1351-00-00be-pdt-phy-pilot.docx) Pilot Jinyoung Chun
     + [1403r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1403-00-00be-pdt-phy-txvector-rxvector-trigvector-config-vector.doc) TX/RXVECTOR-TRIGVECTOR-CONFIG\_VECTOR Bo Sun
     + [1404r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1404-00-00be-pdt-phy-support-for-non-ht-ht-vht-he-format-and-regulatory.doc) Support-for-NON-HT-HT-VHT-HE-Format-and-Reg. Bo Sun
     + [1447r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1447-01-00be-pdt-subcarriers-and-resource-allocation-for-multiple-rus.docx) Subcarriers and Resource Allocation for Multiple RUs Jianhan Liu
     + [1448r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1448-00-00be-pdt-resource-unit-interleaving-for-rus-and-multipe-rus.docx) Resource Unit-Interleaving for RUs and Multipe RUs Jianhan Liu
     + [1452r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1452-00-00be-pdt-segment-parser.docx) Segment parser Jianhan Liu
     + [1307r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1307-00-00be-pdt-phy-introduction-to-eht-phy.docx) PHY introduction Bin Tian
     + [1462r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1462-00-00be-pdt-phy-tx-mask.docx) Tx Mask Xiaogang Chen
   * **Technical Submissions:**
     + [1135r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1135-03-00be-papr-issues-for-eht-er-su-ppdu.pptx) PAPR Issues for EHT ER SU PPDU Eunsung Park [3 SPs]
     + [1161r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1161-00-00be-eht-punctured-ndp-and-partial-bandwidth-feedback.pptx) EHT Punctured NDP and Partial bandwidth feedback. Bin Tian [SPs]
     + [1223r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1223-01-00be-subcarrier-grouping-for-eht.pptx) Subcarrier Grouping for EHT Eunsung Jeon
     + [1159r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1159-00-00be-11be-spectral-mask.pptx) 11be spectral mask Bin Tian
     + [1180r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1180-00-00be-spectrum-mask-requirement-for-punctured-transmission.pptx) Spectrum mask requirement for punctured Transmission Wookbong Lee
     + [1165r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1165-00-00be-spectrum-mask-for-puncturing.pptx) Spectrum mask for puncturing Xiaogang Chen
     + [1174r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1174-00-00be-e-sig-with-different-puncturing-patterns.pptx) E-SIG Detection with Different Puncturing Patterns Junghoon Suh
     + [1191r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1191-00-00be-dup-mode-papr-reduction.pptx) DUP mode PAPR reduction Ron Porat
     + [1178r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1178-00-00be-discussions-on-mu-mimo-signaling.pptx) Discussions on MU-MIMO Signaling Mengshi Hu
     + [1206r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1206-00-00be-discussions-on-papr-reduction-methods-for-dup-mode.pptx) Discussions on PAPR Reduction Methods for DUP Mode ChenChen Liu
     + [1238r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1238-00-00be-open-issues-on-preamble-design.pptx) Open Issues on Preamble Design Sameer Vermani
     + [1259r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1259-00-00be-puncturing-patterns-for-ofdma.pptx) Puncturing patterns for ofdma Ron Porat
     + [1310r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1310-00-00be-coding-bit-in-mu-mimo.pptx) Coding bit in MU-MIMO Ron Porat
     + [1311r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1311-00-00be-2x-320mhz-ltf-design.pptx) 2x LTF 320MHz sequences Ron Porat
     + [1317r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1317-00-00be-sig-contents-discussion-for-eht-sounding-ndp.pptx) SIG-contents-discussion-for-eht-sounding-ndp Ross Yu
     + [1347r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1347-00-00be-lpi-ppdu-format.pptx) LPI PPDU format Junghoon Suh
     + [1375r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1375-01-00be-eht-nltf-design.pptx) EHT NLTF Design Rui Cao
     + [1331r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1331-00-00be-eht-pre-fec-padding-and-packet-extension.pptx) EHT pre-FEC padding and packet extension Rui Cao
     + [1132r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1132-00-00be-thoughts-on-extended-range-preamble.pptx) Thoughts on Extended Range Preamble Bin Tian
     + [1377r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1377-00-00be-on-tbd-mcss.pptx) On TBD MCSs Jianhan Liu
     + [1322r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1322-00-00be-phy-signaling-methodology-for-11be-releases.pptx) PHY Signaling Methodology Rui Yang
     + [1446r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1446-00-00be-pilot-polarities-for-small-m-rus.pptx) Pilot Polarities for Small M-RUs Ron Porat
     + [1441r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1441-00-00be-ru-restriction-for-20mhz-operation.pptx) RU Restriction for 20MHz Operation Eunsung Park
     + [1467r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1467-00-00be-bw320-signaling.pptx) 320MHz signaling Ron Porat
     + [1342r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1342-00-00be-eht-sounding-feedback-request-parameters.pptx) EHT Sounding feedback request parameters Genadiy Tsodik

**Attendance**

The following people recorded their attendance for this call:

* Kwok Shum Au (Huawei)
* Hari Ram (Nxp Semiconductors)
* Eugene Baik (Qualcomm Incorporated)
* Jianwei Bei (Nxp Semiconductors)
* Rui Cao (Nxp Semiconductors)
* Gurkan Cepni (Apple, Inc.)
* Xiaogang Chen (Intel)
* Jinsoo Choi (Lg Electronics)
* Seungho Choo (Senscomm Semiconductor Co., Ltd.)
* Yanyi Ding (Panasonic Corporation)
* Dung Doan (Qualcomm Incorporated)
* Ruchen Duan (Samsung)
* Ahmed Elsherif (Qualcomm Incorporated)
* Shuling Feng (Mediatek Inc.)
* James Gardner (Qualcomm Incorporated)
* Alireza Ghaderipoor (Mediatek Inc.)
* Bo Gong (Huawei Technologies Co. Ltd)
* Niranjan Grandhe (Nxp Semiconductors)
* Brian Hart (Cisco Systems, Inc.)
* Ching-Wen Hsiao (Mediatek Inc.)
* Hung-Tao Hsieh (Mediatek Inc.)
* Mengshi Hu (Huawei)
* Lei Huang (Oppo)
* Jeorge Hurtarte (Teradyne, Inc.)
* Eunsung Jeon (Samsung Electronics)
* Chenhe Ji (Huawei Technologies Co. Ltd)
* Feng Jiang (Apple Inc.)
* Jeng-Shiann Jiang (Vertexcom Technologies)
* Allan Jones (Activision)
* Jeffrum Jones (Qorvo)
* Vincent Knowles Iv Jones (Qualcomm Incorporated)
* Ishaque Ashar Kadampot (Qualcomm Incorporated)
* Mahmoud Kamel (Interdigital, Inc.)
* Sugbong Kang (Apple, Inc.)
* Kenneth Kerpez (Assia)
* Myeong-Jin Kim (Samsung)
* Youhan Kim (Qualcomm Incorporated)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Incorporated)
* Qinghua Li (Intel Corporation)
* Dong Guk Lim (Lg Electronics)
* Erik Lindskog (Samsung)
* Der-Zheng Liu (Realtek Semiconductor Corp.)
* Jianhan Liu (Mediatek Inc.)
* Hanqing Lou (Interdigital, Inc.)
* Li Ma (Mediatek Inc.)
* Ebubekir Memisoglu (Istanbul Medipol University; Vestel)
* Jun Minotani (Panasonic Corporation)
* Khashayar Mirfakhraei (Cisco Systems, Inc.)
* Takayuki Nakano (Panasonic Corporation)
* Junyoung Nam (Qualcomm Incorporated)
* Yujin Noh (Newracom Inc.)
* Thomas Pare (Mediatek Inc.)
* Eunsung Park (Lg Electronics)
* Richard Perkins (Qorvo)
* Riku Pirhonen (Nxp Semiconductors)
* Ron Porat (Broadcom Corporation)
* Srinath Puducheri (Broadcom Corporation)
* Rethnakaran Pulikkoonattu (Broadcom Corporation)
* Kapil Rai (Qualcomm Incorporated)
* Oded Redlich (Huawei)
* Meriam Rezk (Qualcomm Incorporated)
* Sigurd Schelstraete (Quantenna Communications, Inc.)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Shree Raman Srinivasan (Qualcomm Incorporated)
* Paul Strauch (Qualcomm Incorporated)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bo Sun (Zte Corporation)
* Bin Tian (Qualcomm Incorporated)
* Tao Tian (Unisoc Comm.)
* Genadiy Tsodik (Huawei Technologies Co. Ltd)
* Yoshio Urabe (Panasonic Corporation)
* Prabodh Varshney (Nokia)
* Sameer Vermani (Qualcomm Incorporated)
* Yi-Hsiu Wang (Zeku)
* Kanke Wu (Qualcomm Incorporated)
* Yan Xin (Huawei Technologies Co., Ltd)
* Ruifeng Xue (Cisco Systems, Inc.)
* Aiguo Yan (Oppo)
* Rui Yang (Interdigital, Inc.)
* Steve Ts Yang (Mediatek Inc.)
* Yair Yona (Qualcomm Incorporated)
* Christopher Young (Broadcom Corporation)
* Heejung Yu (Korea University)
* Jian Yu (Huawei Technologies Co., Ltd)
* Mao Yu (Nxp Semiconductors)
* Salah Eddine Zegrar (Istanbul Medipol University; Vestel)
* Ruochen Zeng (Nxp Semiconductors)
* Yan Zhang (Nxp Semiconductors)

**Straw polls**

1290r3 Parameters-for-EHT-MCSs (Yujin Noh)

Changes are reviewed. It was decided not to decide on the numbering of DCM and DCM+DUP. They are left TBD for now.

Discussion:

Q: will tables for NSS>1 be listed?

A: this only includes tables for NSS=1.

Q: can we at least have a table listing the data rates.

A: can be added in later versions. Possible a plot can be used instead of a table.

SP#1: Do you agree to accept spec text proposed in 1209r3 in 11be draft 0.1?

No objection. Passed with unanimous consent.

1276r6 EHT-preamble-EHT-SIG (Ross Jian Yu)

Colors are used to track changes in successive versions.

Some more TBDs added. Coding part is made yellow (indicating TBD)

r7 is uploaded to correct some typos.

SP#2: Do you agree to accept text in 1267r7 for 11be draft 0.1

No objection. Passed with unanimous consent.

1315r4 Support for large bandwidth (Yan Xin)

Discussion

Q: 80 MHz can not support 2x996. MRUs have to be added.

A: MRUs are included. MRUs are changed to TBD.

Q: Should include mention of 20 MHz operating devices.

Q: please highlight all 80+80 and 160 to keep them TBD for now.

Document will be revised and reconsidered later.

1371r4 Subcarriers-and-resource-allocation-for-wideband (Yan Xin)

Additional tables for RU allocations for 160 and 320 MHz added.

Described subcarrier index related to MRU.

SP#3: Do you agree to accept text in 1371r4 for 11be draft 0.1

No objection. Passed with unanimous consent.

**New presentations**

1338r5 EHT Modulation and Coding (EHT-MCSs) (Rethna Pulikkoonattu)

Should we include all the tables? Helpful to include for specific scenarios.

A plot could be used to present the data for data rates.

Discussion

Q: Should use Nss,u instead of Nss

Q: should appendix be included.

A: no. up to editor. Will indicate explicitly.

Minor changes made - r6 is uploaded.

SP#4: Do you agree to accept text in 1338r6 for 11be draft 0.1

No objection. Passed with unanimous consent.

1339r4 Data-field-Coding (Yan Zhang)

Mostly similar to HE sections.

Some changes are made based on member’s feedback.

Q: 996-tone RU is not the correct number for DUP case. Use BW for indication DUP modes. Discussion on naming of DUP modes.

A: will indicate as TBD for now.

SP#5: Do you agree to accept text in 1339r5 for 11be draft 0.1

No objection. Passed with unanimous consent.

1337r1 Mathematical description of signals (Yan Zhang)

Midamble highlighted as TBD. Additional parts highlighted in yellow.

More discussion on channel BW use for e.g. gamma rotation.

Updated to r3.

SP#6: Do you agree to accept text in 1337r3 for 11be draft 0.1

No objection. Passed with unanimous consent.

1340r2 Packet Extension (Yan Zhang)

Similar to 11ax. Only MU description.

Non-decided parts (e.g. midamble) highlighted in yellow

SP#7: Do you agree to accept text in 1340r2 for 11be draft 0.1

No objection. Passed with unanimous consent.

**Recess**

Meeting is recessed at 9pm ET.

**Monday Sept 21st, 2020 10:00 – 13:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 10:00 ET.
2. The Chair follows the agenda in 11-20/1269r8
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 sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself.
5. Announcements: None

* PDT Status for R1 PHY features:

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| --- | --- | --- | --- |
| **Not Uploaded** | **Uploaded** | **And Presented** | **And Passed StrawPoll** |
|  | 1462, 1464, 1466, 1480, 1479, 1494, 1495. |  | [1293r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1293-01-00be-pdt-phy-scope-and-eht-phy-functions.docx), [1295r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1295-01-00be-pdt-phy-overview-of-the-ppdu-enconding-process.docx), [1160r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1160-04-00be-pdt-phy-mu-mimo.docx), [1327r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1327-01-00be-pdt-eht-ppdu-format.docx), [1153r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1153-03-00be-pdt-phy-timing-related-parameters.docx), [1260r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1260-04-00be-pdt-phy-eht-stf.docx), [1349r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1349-03-00be-pdt-constellation-mapping.docx), [1231r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1231-03-00be-pdt-phy-beamforming.docx), [1252r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1252-02-00be-pdt-phy-frequency-tolerance.docx), [1253r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1253-06-00be-pdt-phy-modulation-accuracy.docx), [1254r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1254-06-00be-pdt-phy-receive-specification-general-and-receiver-minimum-input-sensitivity-and-channel-rejection.docx), [1229r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1229-03-00be-pdt-phy-channel-numbering-and-channelization.docx), [1294r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1294-04-00be-pdt-phy-eht-plme.docx), [1329r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1329-02-00be-pdt-eht-preamble-l-stf-l-ltf-l-sig-and-rl-sig.docx), [1290r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1290-03-00be-pdt-phy-parameters-for-eht-mcss.docx), [1276r7](https://mentor.ieee.org/802.11/dcn/20/11-20-1276-07-00be-pdt-phy-eht-preamble-eht-sig.docx), [1371r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1371-04-00be-pdt-phy-subcarriers-and-resource-allocation-for-wideband.docx), [1338r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1338-06-00be-pdt-phy-eht-modulation-and-coding-eht-mcss.docx), [1339r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1339-05-00be-pdt-phy-data-field-coding.docx), [1337r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1337-03-00be-pdt-phy-mathematical-description-of-signals.docx), [1340r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1340-02-00be-pdt-phy-packet-extension.docx), [1315r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1315-06-00be-draft-text-for-support-for-large-bandwidth.docx), [1319r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1319-03-00be-pdt-phy-preamble-puncture.docx), [1351r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1351-05-00be-pdt-phy-pilot.docx), [1403r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1403-04-00be-pdt-phy-txvector-rxvector-trigvector-config-vector.doc), [1404r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1404-02-00be-pdt-phy-support-for-non-ht-ht-vht-he-format-and-regulatory.doc), [1447r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1447-06-00be-pdt-subcarriers-and-resource-allocation-for-multiple-rus.docx), [1448r7](https://mentor.ieee.org/802.11/dcn/20/11-20-1448-07-00be-pdt-resource-unit-interleaving-for-rus-and-multipe-rus.docx), [1452r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1452-03-00be-pdt-segment-parser.docx), [1307r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1307-02-00be-pdt-phy-introduction-to-eht-phy.docx). |

* Technical Submissions: **Proposed Draft Text (PDTs)**
  + [1315r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1315-05-00be-draft-text-for-support-for-large-bandwidth.docx) Support for large bandwidth Yan Xin [SP]
  + [1319r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1319-02-00be-pdt-phy-preamble-puncture.docx) Preamble-Puncture Oded Redlich
  + [1351r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1351-03-00be-pdt-phy-pilot.docx) Pilot Jinyoung Chun
  + [1403r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1403-03-00be-pdt-phy-txvector-rxvector-trigvector-config-vector.doc) TX/RXVECTOR-TRIGVECTOR-CONFIG\_VECTOR Bo Sun
  + [1404r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1404-02-00be-pdt-phy-support-for-non-ht-ht-vht-he-format-and-regulatory.doc) Support-for-NON-HT-HT-VHT-HE-Format-and-Reg. Bo Sun
  + [1447r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1447-02-00be-pdt-subcarriers-and-resource-allocation-for-multiple-rus.docx) Subcarriers and Resource Allocation for Multiple RUs Jianhan Liu
  + [1448r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1448-04-00be-pdt-resource-unit-interleaving-for-rus-and-multipe-rus.docx) Resource unit-Interleaving for RUs and Multipe RUs Jianhan Liu
  + [1452r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1452-02-00be-pdt-segment-parser.docx) Segment Parser Jianhan Liu
  + [1307r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1307-01-00be-pdt-phy-introduction-to-eht-phy.docx) Introduction-to-EHT-PHY Bin Tian
  + [1462r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1462-01-00be-pdt-phy-tx-mask.docx) PHY-Tx-Mask Xiaogang Chen
  + [1464r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1464-00-00be-pdt-phy-u-sig.docx) PHY U-SIG Sameer Vermani
  + [1466r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1466-00-00be-pdt-phy-eht-sounding-ndp.docx) PHY EHT Sounding NDP Sameer Vermani
  + [1480r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1480-00-00be-pdt-phy-s-flatness.docx) PHY-S\_flatness Xiaogang Chen
  + [1479r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1479-00-00be-pdt-phy-t-block.docx) PHY-T\_block Xiaogang Chen
  + [1494r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1494-01-00be-pdt-of-eht-phy-data-scrambler-and-descrambler.docx) PHY DATA scrambler and descrambler Chenchen LIU
  + [1495r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1495-01-00be-pdt-of-eht-ltf-sequences.docx) EHT LTF sequences Chenchen LIU
* Technical Submissions:
  + [1135r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1135-03-00be-papr-issues-for-eht-er-su-ppdu.pptx) PAPR Issues for EHT ER SU PPDU Eunsung Park [3 SPs]
  + [1161r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1161-00-00be-eht-punctured-ndp-and-partial-bandwidth-feedback.pptx) EHT Punctured NDP and Partial bandwidth feedback. Bin Tian [SPs]
  + [1223r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1223-01-00be-subcarrier-grouping-for-eht.pptx) Subcarrier Grouping for EHT Eunsung Jeon
  + [1159r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1159-00-00be-11be-spectral-mask.pptx) 11be spectral mask Bin Tian
  + [1180r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1180-00-00be-spectrum-mask-requirement-for-punctured-transmission.pptx) Spectrum mask requirement for punctured Transmission Wookbong Lee
  + [1165r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1165-00-00be-spectrum-mask-for-puncturing.pptx) Spectrum mask for puncturing Xiaogang Chen
  + [1174r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1174-00-00be-e-sig-with-different-puncturing-patterns.pptx) E-SIG Detection with Different Puncturing Patterns Junghoon Suh
  + [1191r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1191-00-00be-dup-mode-papr-reduction.pptx) DUP mode PAPR reduction Ron Porat
  + [1178r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1178-00-00be-discussions-on-mu-mimo-signaling.pptx) Discussions on MU-MIMO Signaling Mengshi Hu
  + [1180r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1180-00-00be-spectrum-mask-requirement-for-punctured-transmission.pptx) Spectrum Mask Requirement for Punctured Transmission Wook Bong Lee
  + [1206r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1206-00-00be-discussions-on-papr-reduction-methods-for-dup-mode.pptx) Discussions on PAPR Reduction Methods for DUP Mode ChenChen Liu
  + [1238r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1238-00-00be-open-issues-on-preamble-design.pptx) Open Issues on Preamble Design Sameer Vermani
  + [1259r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1259-00-00be-puncturing-patterns-for-ofdma.pptx) Puncturing patterns for ofdma Ron Porat
  + [1310r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1310-00-00be-coding-bit-in-mu-mimo.pptx) Coding bit in MU-MIMO Ron Porat
  + [1311r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1311-00-00be-2x-320mhz-ltf-design.pptx) 2x LTF 320MHz sequences Ron Porat
  + [1317r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1317-00-00be-sig-contents-discussion-for-eht-sounding-ndp.pptx) SIG-contents-discussion-for-eht-sounding-ndp Ross Yu
  + [1347r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1347-00-00be-lpi-ppdu-format.pptx) LPI PPDU format Junghoon Suh
  + [1375r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1375-01-00be-eht-nltf-design.pptx) EHT NLTF Design Rui Cao
  + [1331r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1331-00-00be-eht-pre-fec-padding-and-packet-extension.pptx) EHT pre-FEC padding and packet extension Rui Cao
  + [1132r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1132-00-00be-thoughts-on-extended-range-preamble.pptx) Thoughts on Extended Range Preamble Bin Tian
  + [1377r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1377-00-00be-on-tbd-mcss.pptx) On TBD MCSs Jianhan Liu
  + [1322r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1322-00-00be-phy-signaling-methodology-for-11be-releases.pptx) PHY Signaling Methodology Rui Yang
  + [1446r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1446-00-00be-pilot-polarities-for-small-m-rus.pptx) Pilot Polarities for Small M-RUs Ron Porat
  + [1441r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1441-00-00be-ru-restriction-for-20mhz-operation.pptx) RU Restriction for 20MHz Operation Eunsung Park
  + [1467r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1467-00-00be-bw320-signaling.pptx) 320MHz signaling Ron Porat
  + [1342r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1342-00-00be-eht-sounding-feedback-request-parameters.pptx) EHT Sounding feedback request parameters Genadiy Tsodik
  + 1515r0 Signaling for various transmission modes of MU PPDU Dongguk Lim

*\* Note: Need to be uploaded to Mentor website 7 days prior to the conf call*

**Attendance**

The following people recorded their attendance for this call:

* Gary Anwyl (Mediatek Inc.)
* Kwok Shum Au (Huawei Technologies Co.,  Ltd)
* Hari Ram B (Nxp Semiconductors)
* Jinsoo Choi (Lg Electronics)
* Seungho Choo (Senscomm Semiconductor Co., Ltd.)
* Jinyoung Chun (Lg Electronics)
* John Coffey (Realtek Semiconductor Corp.)
* Yanyi Ding (Panasonic Corporation)
* Shuling Feng (Mediatek Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Niranjan Grandhe (Nxp Semiconductors)
* Thomas Handte (Sony Corporation)
* Lili Hervieu (Cablelabs)
* Hung-Tao Hsieh (Mediatek Inc.)
* Lei Huang (Oppo)
* Eunsung Jeon (Samsung Electronics)
* Feng Jiang (Apple Inc.)
* Mahmoud Kamel (Interdigital, Inc.)
* Assaf Kasher (Qualcomm Incorporated)
* Myeong-Jin Kim (Samsung)
* Youhan Kim (Qualcomm Incorporated)
* James Lansford (Qualcomm Incorporated)
* Wookbong Lee (Samsung)
* Jialing Li (Qualcomm Incorporated)
* Dong Guk Lim (Lg Electronics)
* Chenchen Liu (Huawei Technologies Co., Ltd)
* Jianhan Liu (Mediatek Inc.)
* Miguel Lopez (Ericsson Ab)
* Mikael Lorgeoux (Canon Research Centre France)
* Hanqing Lou (Interdigital, Inc.)
* Li Ma (Mediatek Inc.)
* Khashayar Mirfakhraei (Cisco Systems, Inc.)
* Leo Montreuil (Broadcom Corporation)
* Yujin Noh (Newracom Inc.)
* Thomas Pare (Mediatek Inc.)
* Srinath Puducheri (Broadcom Corporation)
* Kapil Rai (Qualcomm Incorporated)
* Oded Redlich (Huawei)
* Sayak Roy (Nxp Semiconductors)
* Sigurd Schelstraete (Quantenna Communications, Inc.)
* Ankit Sethi (Nxp Semiconductors)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Paul Strauch (Qualcomm Incorporated)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Genadiy Tsodik (Huawei Technologies Co. Ltd)
* Allert Van Zelst (Qualcomm Incorporated)
* Daniel Verenzuela (Sony Corporation)
* Sameer Vermani (Qualcomm Incorporated)
* Yan Xin (Huawei Technologies Co., Ltd)
* Aiguo Yan (Oppo)
* Steve Ts Yang (Mediatek Inc.)
* Yongjiang Yi (Futurewei Technologies)
* Jian Yu (Huawei Technologies Co., Ltd)
* Yifan Zhou (Huawei Technologies Co., Ltd)

**Presentations**

[1315r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1315-05-00be-draft-text-for-support-for-large-bandwidth.docx) Support for large bandwidth (Yan Xin)

Support of wideband OFDMA operation. Title has been clarified.

Added 20 MHz operating non-AP STA.

SP#1:

Do you agree to accept text in 1315r6 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1351r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1351-03-00be-pdt-phy-pilot.docx) Pilot (Jinyoung Chun)

PDT text for pilot subclause.

Discussion

MRU is only mentioned for 320 MHz. Should we remove sentence or add other BWs? Text will be removed.

Some confusion about 4x LTF and 2x LTF pilot index vs. 1x. Proposed text is consistent with 11ax.

R5 is uploaded with requested changes.

SP#2:

Do you agree to accept text in 1351r5 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1319r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1319-02-00be-pdt-phy-preamble-puncture.docx) Preamble-Puncture (Oded Redlich)

Draft text for preamble puncturing.

Discussion

Q: need to add section titles in addition to section numbers.

A: references are to U-SIG and EHT-SIG.

Q: difference between transmission bw and channel bw?

A: different for punctured channel.

Q: Proposed to us “PPDU BW” instead. Text is changed accordingly.

Q: use OFDMA vs. non-OFDMA to distinguish between the two puncturing cases. Need to clarify compression modes.

Text is highlighted as TBD awaiting further clarification.

R3 is uploaded with the requested changes.

SP#3:

Do you agree to accept text in 1319r3 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1403r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1403-03-00be-pdt-phy-txvector-rxvector-trigvector-config-vector.doc) TX/RXVECTOR-TRIGVECTOR-CONFIG\_VECTOR (Bo Sun)

Most descriptions taken from 11ax.

More like a framework. More to be added.

Discussion

Q: Why is NON HT MODULATION yellow?

A: hasn’t been discussed yet. Maybe inclusion of inherited parameters can be simplified.

Q: don’t need center 26 RU anymore. Midamble has not been discussed yet – make TBD.

Q: Beam change not there anymore. There is no SU PPDU, and was not supported in MU in 11ax.

Fields are removed. R4 is uploaded.

SP#4:

Do you agree to accept text in 1403r4 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1404r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1404-02-00be-pdt-phy-support-for-non-ht-ht-vht-he-format-and-regulatory.doc) Support-for-NON-HT-HT-VHT-HE-Format-and-Reg (Bo Sun)

Similar to 11ax. Reference to Clause 27 added.

No Discussion

SP#5:

Do you agree to accept text in 1404r2 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1447r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1447-02-00be-pdt-subcarriers-and-resource-allocation-for-multiple-rus.docx) Subcarriers and Resource Allocation for Multiple RUs (Jianhan Liu)

Discussion:

Q: in 80 MHz, 52+26: not all combinations of 20 and 40 included. In RU allocation subfield, those fields exist. Restrictions should be stated.

A: shown in figures

Q: Restriction should not be a note, is mandatory behavior

A: changed accordingly

Q: for smaller MRU there is no index. Would be great to include indices for small MRUS as well.

Q: is it mandatory for both STA and AP to support the large MRU? Clarify that this only applies within the supported BW.

A: text is changed to reflect this.

Q: change “transmission” to “PPDU”

A: changed in text.

Q: should segment be defined as 80 MHz? term is used here for both 80 and 160 MHz. Proposed to change “segment” to “channel”.

A: changed in text

R6 uploaded

SP#6:

Do you agree to accept text in 1447r6 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1448r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1448-04-00be-pdt-resource-unit-interleaving-for-rus-and-multipe-rus.docx) Resource unit-Interleaving for RUs and Multiple RUs (Jianhan Liu)

Parameters for interleaving and LDPC tone mapping.

Discussion

Q: allow for both BCC and LDPC on small size MRUs

A: text modified

R7 uploaded

SP#7:

Do you agree to accept text in 1448r7 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1452r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1452-02-00be-pdt-segment-parser.docx) Segment Parser (Jianhan Liu)

Discussion

Q: What is definition of “segment”?

A: will be discussed later

Updated to R3 – uploaded to server

SP#8:

Do you agree to accept text in 1452r3 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1307r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1307-01-00be-pdt-phy-introduction-to-eht-phy.docx) Introduction-to-EHT-PHY (Bin Tian)

Based on 11ax and referring to motions that were passed on PHY parts.

Lists supported optional and mandatory features for AP and STAs.

Discussion

Q: some agreement in SFD to support 320 MHz. Here it is shown as TBD. Spec text should reflect SFD, at least in this introduction part.

A: 160+160 not clear enough as mandatory or optional. Let’s put TBD now and clarify later as needed.

Proposed to delete sentence mentioning BW support.

Q: for 20 MHz: why only supported in primary 20 MHz? Should support any channel.

A: depends on SST. This is text from 11ax. Will double check – can be refined in next version.

R2 uploaded.

SP#9:

Do you agree to accept text in 1307r2 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

**Adjourn**

Meeting is adjourned at 12:55pm ET.

**Thursday Sept 24th, 2020 19:00 – 22:00 ET**

**Introduction**

* The Chair (Tianyu Wu, Apple) calls the meeting to order at 19:00 ET.
* The Chair follows the agenda in 11-20/1269r12
* The Chair goes through the IPR policy and asks if anyone is aware of any potentially essential patents. Nobody speaks up.
* The Chair reminds everyone to report their attendance by sending an e-mail to the Co-chair, Sigurd Schelstraete (ON Semiconductor) or the Chair himself.
* Announcements: None
* PDT Status for R1 PHY features:

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| --- | --- | --- | --- |
| **Not Uploaded** | **Uploaded** | **And Presented** | **And Passed StrawPoll** |
|  |  | 1494 | [1293r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1293-01-00be-pdt-phy-scope-and-eht-phy-functions.docx), [1295r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1295-01-00be-pdt-phy-overview-of-the-ppdu-enconding-process.docx), [1160r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1160-06-00be-pdt-phy-mu-mimo.docx), [1327r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1327-01-00be-pdt-eht-ppdu-format.docx), [1153r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1153-03-00be-pdt-phy-timing-related-parameters.docx), [1260r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1260-04-00be-pdt-phy-eht-stf.docx), [1349r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1349-03-00be-pdt-constellation-mapping.docx), [1231r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1231-03-00be-pdt-phy-beamforming.docx), [1252r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1252-02-00be-pdt-phy-frequency-tolerance.docx), [1253r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1253-06-00be-pdt-phy-modulation-accuracy.docx), [1254r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1254-06-00be-pdt-phy-receive-specification-general-and-receiver-minimum-input-sensitivity-and-channel-rejection.docx), [1229r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1229-03-00be-pdt-phy-channel-numbering-and-channelization.docx), [1294r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1294-04-00be-pdt-phy-eht-plme.docx), [1329r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1329-02-00be-pdt-eht-preamble-l-stf-l-ltf-l-sig-and-rl-sig.docx), [1290r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1290-03-00be-pdt-phy-parameters-for-eht-mcss.docx), [1276r7](https://mentor.ieee.org/802.11/dcn/20/11-20-1276-07-00be-pdt-phy-eht-preamble-eht-sig.docx), [1371r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1371-04-00be-pdt-phy-subcarriers-and-resource-allocation-for-wideband.docx), [1338r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1338-06-00be-pdt-phy-eht-modulation-and-coding-eht-mcss.docx), [1339r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1339-05-00be-pdt-phy-data-field-coding.docx), [1337r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1337-03-00be-pdt-phy-mathematical-description-of-signals.docx), [1340r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1340-02-00be-pdt-phy-packet-extension.docx), [1315r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1315-06-00be-draft-text-for-support-for-large-bandwidth.docx), [1351r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1351-05-00be-pdt-phy-pilot.docx), [1319r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1319-03-00be-pdt-phy-preamble-puncture.docx), [1403r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1403-04-00be-pdt-phy-txvector-rxvector-trigvector-config-vector.doc), [1404r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1404-02-00be-pdt-phy-support-for-non-ht-ht-vht-he-format-and-regulatory.doc), [1447r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1447-06-00be-pdt-subcarriers-and-resource-allocation-for-multiple-rus.docx), [1448r7](https://mentor.ieee.org/802.11/dcn/20/11-20-1448-07-00be-pdt-resource-unit-interleaving-for-rus-and-multipe-rus.docx), [1452r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1452-03-00be-pdt-segment-parser.docx), [1307r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1307-04-00be-pdt-phy-introduction-to-eht-phy.docx), [1462r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1462-02-00be-pdt-phy-tx-mask.docx), [1464r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1464-02-00be-pdt-phy-u-sig.docx), [1466r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1466-00-00be-pdt-phy-eht-sounding-ndp.docx), [1480r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1480-01-00be-pdt-phy-s-flatness.docx), [1479r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1479-02-00be-pdt-phy-t-block.docx), [1495r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1495-03-00be-pdt-of-eht-ltf-sequences.docx). |

* Technical Submissions: **Proposed Draft Text (PDTs) [Each: 20 mins first preso, 10 mins SP]**
  + [1307r4](https://mentor.ieee.org/802.11/dcn/20/11-20-1307-04-00be-pdt-phy-introduction-to-eht-phy.docx) Introduction to EHT PHY Bin Tian
  + [1462r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1462-01-00be-pdt-phy-tx-mask.docx) PHY-Tx-Mask Xiaogang Chen
  + [1464r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1464-00-00be-pdt-phy-u-sig.docx) PHY U-SIG Sameer Vermani
  + [1466r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1466-00-00be-pdt-phy-eht-sounding-ndp.docx) PHY EHT Sounding NDP Sameer Vermani
  + [1160r5](https://mentor.ieee.org/802.11/dcn/20/11-20-1160-05-00be-pdt-phy-mu-mimo.docx) MU-MIMO Sameer Vermani
  + [1480r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1480-00-00be-pdt-phy-s-flatness.docx) PHY-S\_flatness Xiaogang Chen
  + [1479r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1479-00-00be-pdt-phy-t-block.docx) PHY-T\_block Xiaogang Chen
  + [1494r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1494-01-00be-pdt-of-eht-phy-data-scrambler-and-descrambler.docx) PHY DATA scrambler and descrambler Chenchen LIU
  + [1495r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1495-01-00be-pdt-of-eht-ltf-sequences.docx) EHT LTF sequences Chenchen LIU
* Technical Submissions:
  + [1191r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1191-00-00be-dup-mode-papr-reduction.pptx) DUP mode PAPR reduction Ron Porat
  + [1206r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1206-00-00be-discussions-on-papr-reduction-methods-for-dup-mode.pptx) Discussions on PAPR Reduction Methods for DUP Mode ChenChen Liu
  + [1135r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1135-03-00be-papr-issues-for-eht-er-su-ppdu.pptx) PAPR Issues for EHT ER SU PPDU Eunsung Park [3 SPs]
  + [1161r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1161-00-00be-eht-punctured-ndp-and-partial-bandwidth-feedback.pptx) EHT Punctured NDP and Partial bandwidth feedback. Bin Tian [SPs]
  + [1223r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1223-01-00be-subcarrier-grouping-for-eht.pptx) Subcarrier Grouping for EHT Eunsung Jeon
  + [1159r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1159-00-00be-11be-spectral-mask.pptx) 11be spectral mask Bin Tian
  + [1180r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1180-00-00be-spectrum-mask-requirement-for-punctured-transmission.pptx) Spectrum mask requirement for punctured Transmission Wookbong Lee
  + [1165r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1165-00-00be-spectrum-mask-for-puncturing.pptx) Spectrum mask for puncturing Xiaogang Chen
  + [1174r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1174-00-00be-e-sig-with-different-puncturing-patterns.pptx) E-SIG Detection with Different Puncturing Patterns Junghoon Suh
  + [1178r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1178-00-00be-discussions-on-mu-mimo-signaling.pptx) Discussions on MU-MIMO Signaling Mengshi Hu
  + [1180r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1180-00-00be-spectrum-mask-requirement-for-punctured-transmission.pptx) Spectrum Mask Requirement for Punctured Transmission Wook Bong Lee
  + [1238r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1238-00-00be-open-issues-on-preamble-design.pptx) Open Issues on Preamble Design Sameer Vermani
  + [1259r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1259-00-00be-puncturing-patterns-for-ofdma.pptx) Puncturing patterns for ofdma Ron Porat
  + [1310r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1310-00-00be-coding-bit-in-mu-mimo.pptx) Coding bit in MU-MIMO Ron Porat
  + [1311r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1311-00-00be-2x-320mhz-ltf-design.pptx) 2x LTF 320MHz sequences Ron Porat
  + [1317r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1317-00-00be-sig-contents-discussion-for-eht-sounding-ndp.pptx) SIG-contents-discussion-for-eht-sounding-ndp Ross Yu
  + [1347r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1347-01-00be-lpi-ppdu-format.pptx) LPI PPDU format Junghoon Suh
  + [1375r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1375-01-00be-eht-nltf-design.pptx) EHT NLTF Design Rui Cao
  + [1331r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1331-00-00be-eht-pre-fec-padding-and-packet-extension.pptx) EHT pre-FEC padding and packet extension Rui Cao
  + [1132r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1132-00-00be-thoughts-on-extended-range-preamble.pptx) Thoughts on Extended Range Preamble Bin Tian
  + [1377r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1377-00-00be-on-tbd-mcss.pptx) On TBD MCSs Jianhan Liu
  + [1322r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1322-00-00be-phy-signaling-methodology-for-11be-releases.pptx) PHY Signaling Methodology Rui Yang
  + [1446r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1466-00-00be-pdt-phy-eht-sounding-ndp.docx) Pilot Polarities for Small M-RUs Ron Porat
  + [1441r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1441-01-00be-ru-restriction-for-20mhz-operation.pptx) RU Restriction for 20MHz Operation Eunsung Park
  + [1467r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1467-00-00be-bw320-signaling.pptx) 320MHz signaling Ron Porat
  + [1342r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1342-00-00be-eht-sounding-feedback-request-parameters.pptx) EHT Sounding feedback request parameters Genadiy Tsodik
  + 1515r0 Signaling for various transmission modes of MU PPDU Dongguk Lim

**Attendance**

The following people recorded their attendance for this call:

* Gary Anwyl (Mediatek Inc.)
* Kwok Shum Au (Huawei Technologies Co.,  Ltd)
* Hari Ram B (Nxp Semiconductors)
* Rui Cao (Nxp Semiconductors)
* Jinsoo Choi (Lg Electronics)
* Seungho Choo (Senscomm Semiconductor Co., Ltd.)
* Jinyoung Chun (Lg Electronics)
* John Coffey (Realtek Semiconductor Corp.)
* Yanyi Ding (Panasonic Corporation)
* Shuling Feng (Mediatek Inc.)
* Alireza Ghaderipoor (Mediatek Inc.)
* Niranjan Grandhe (Nxp Semiconductors)
* Hung-Tao Hsieh (Mediatek Inc.)
* Eunsung Jeon (Samsung Electronics)
* Feng Jiang (Apple Inc.)
* Mahmoud Kamel (Interdigital, Inc.)
* Youhan Kim (Qualcomm Incorporated)
* Wookbong Lee (Samsung)
* Dong Guk Lim (Lg Electronics)
* Erik Lindskog (Samsung)
* Der-Zheng Liu (Realtek Semiconductor Corp.)
* Hanqing Lou (Interdigital, Inc.)
* Li Ma (Mediatek Inc.)
* Jun Minotani (Panasonic Corporation)
* Khashayar Mirfakhraei (Cisco Systems, Inc.)
* Leo Montreuil (Broadcom Corporation)
* Takayuki Nakano (Panasonic Corporation)
* Yujin Noh (Newracom Inc.)
* Eunsung Park (Lg Electronics)
* Ron Porat (Broadcom Corporation)
* Oded Redlich (Huawei)
* Sigurd Schelstraete (Quantenna Communications, Inc.)
* Ankit Sethi (Nxp Semiconductors)
* Stephen Shellhammer (Qualcomm Incorporated)
* Shimi Shilo (Huawei)
* Paul Strauch (Qualcomm Incorporated)
* Jung Hoon Suh (Huawei Technologies Co. Ltd)
* Bo Sun (Zte Corporation)
* Bin Tian (Qualcomm Incorporated)
* Yi-Hsiu Wang (Zeku)
* Kanke Wu (Qualcomm Incorporated)
* Tianyu Wu (Apple, Inc.)
* Yan Xin (Huawei Technologies Co., Ltd)
* Steve Ts Yang (Mediatek Inc.)
* Jian Yu (Huawei Technologies Co., Ltd)
* Yifan Zhou (Huawei Technologies Co., Ltd)

**Presentations**

1307r4 PDT-PHY-Introduction-to-EHT-PHY (Bin Tian)

Minor updates following offline comments

SP#1:

Do you agree to accept text in 1307r4 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1462r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1462-01-00be-pdt-phy-tx-mask.docx) PHY-Tx-Mask (Xiaogang Chen)

320, 80+80 and 160+160 MHz mask are TBD

Discussion

Q: why no text for punctured case?

A: placeholder section is reserved for this

Q: why do captions say “example” transit mask?

A: there is an absolute limit that is not shown in these figures

Q: we should not use example in the figure title, per editorial rules

A: will be fixed in comment resolution

R2 is uploaded

SP#2:

Do you agree to accept text in 1462r2 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1464r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1464-00-00be-pdt-phy-u-sig.docx) PHY U-SIG (Sameer Vermani)

Draft text for U-SIG.

General, content, CRC calculation, encoding and modulation.

Encoding process happens on per-80 MHz segment basis.

TBD sections highlighted in yellow.

Discussion

Q: SR is not marked as yellow?

A: assumed it would exist but can be made TBD.

Q: we have motion on alignment for PPDU. Some fields need to be the same across 80 MHz segments. Is that described somewhere?

A: Number of symbols not included yet. Some descriptions not complete.

Q: maybe include the motion text in question?

A: added in text

Q: table doesn’t mention version dependent or independent fields. Are these terms still useful?

A: might be good idea to indicate it in the table itself later

Q: reserved bits should be highlighted

A: changed accordingly

R2 is uploaded

SP#3:

Do you agree to accept text in 1464r2 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1466r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1466-00-00be-pdt-phy-eht-sounding-ndp.docx) PHY EHT Sounding NDP (Sameer Vermani)

EHT sounding NDP format. Some elements are known, some sections are still TBD.

Discussion

Q: why is text on beamforming removed?

A: with merging of SU and MU, there may be no need for this.

Q: PE is missing in the figure

A: text mentions it

SP#4:

Do you agree to accept text in 1466r0 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

1160r5 PDT-PHY MU-MIMO (Sameer Vermani)

Simple change made after SP was run.

Total number of streams that is supported for the reception of EHT MU PPDU is explicitly mentioned as TBD.

Discussion

Q: non-AP STA always supports UL MU-MIMO, no need to include it as a restriction

A: text removed.

R6 is uploaded

SP#5:

Do you agree to accept text in 1160r6 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1480r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1480-00-00be-pdt-phy-s-flatness.docx) PHY- Spectral flatness (Xiaogang Chen)

Procedure mostly copied from 11ax. Changes to subcarrier indices.

320 MHz added to the table. 80+80 MHz is TBD.

Discussion

Q: should we mention 160+160?

A: text added for 160+160.

R1 is uploaded.

SP#6:

Do you agree to accept text in 1480r1 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1479r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1479-00-00be-pdt-phy-t-block.docx) PHY-Transmitter block diagram (Xiaogang Chen)

STBC was removed from the diagram.

Minor changes relative to 11ax.

Discussion

Q: do we need block for duplication?

A: TBD block added for DUP.

R2 is uploaded

SP#7:

Do you agree to accept text in 1479r2 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1494r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1494-01-00be-pdt-of-eht-phy-data-scrambler-and-descrambler.docx) PHY DATA scrambler and descrambler (Chenchen LIU)

Based on 11ax scrambler.

Service field changed due to changes in scrambler length.

Discussion

Q: should reserved bits be set to 0?

A: followed the HE standard.

Q: for MU-RTS, why “should” be set to all zero, instead of “shall”?

A: changed to “shall”

Q: disagreement on the figure.

A: different from previous amendments. Switch was introduced to control the first bits of Data Out (for signaling TA). For MU-RTS, we need to control the first 7 bits.

Leave as is for now and have further offline discussion before running SP.

[1495r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1495-01-00be-pdt-of-eht-ltf-sequences.docx) EHT LTF sequences (Chenchen LIU)

320 MHz sequences are TBD.

No discussion

SP#8:

Do you agree to accept text in 1495r1 for 11be draft 0.1?

No objections. Accepted by unanimous consent.

[1191r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1191-00-00be-dup-mode-papr-reduction.pptx) DUP mode PAPR reduction (Ron Porat)

PAPR of duplicate mode is not very good. Preferred PAPR reduction scheme is proposed. Parts of the data tones have inverted sign. Pilot tones are not changed.

Discussion:

Q: Performance of DCM with DUP mode shows little gain. DCM gain is bigger for smaller RUs. For DUP, it doesn’t help much. DCM is not a good design for DUP mode. Simple repetition may be better.

A: prefer DCM to building another mode. Tried other duplication, but results were not very good.

Q: DUP is on top of DCM. PAPR is critical issue for DUP. Maybe further optimization is possible. Doubling the BW leads to doubling of noise as well.

A: if SNR per tone is the same, there will be gain. Most useful for LPI.

SP to be run after all presentations on the topic

[1206r0](https://mentor.ieee.org/802.11/dcn/20/11-20-1206-00-00be-discussions-on-papr-reduction-methods-for-dup-mode.pptx) Discussions on PAPR Reduction Methods for DUP Mode (ChenChen Liu)

Duplication should be done before the IFFT. Several options are evaluated for reducing PAPR.

Discussion

Q: 3 of the options duplicate the signal and multiply parts with -1. Cleaner to operate on the data tones only and on one segment only. Option 2 shows marginal improved PAPR. PER will be worse however because of lack of diversity.

Q: all options have good PAPR. Better to compare PAPR with 80 MHz transmission. Option 3 and 4 are sufficient.

Q: need to check both PER and PAPR for all options. Criterion should be best PAPR and PER.

[1135r3](https://mentor.ieee.org/802.11/dcn/20/11-20-1135-03-00be-papr-issues-for-eht-er-su-ppdu.pptx) PAPR Issues for EHT ER SU PPDU (Eunsung Park)

Previously presented. SPs still to be run.

Discussion

Q: duplication should be only on data tones. Motions already passed. DUP on pilot tone should not be TBD.

A: disagree. Does not apply to PAPR issue.

Q: is this similar to 1191, but with difference on the pilots?

Q: don’t think scheme should be applied to pilots. This leads to two different pilot processing schemes.

A: willing to modify SP to say that PAPR scheme is not applied to pilot tones.

R5 uploaded to server

SP#9

Do you agree to add the following text to the TGbe SFD?

11be supports the following duplication and phase rotation methods which are applied to the data field of the PPDU transmitted to a single user and limited to {MCS0+DCM, Nss=1}

refer to SP2a in 1135r5

Y/N/A: 23/9/8

**Adjourn**

Meeting is adjourned at 10:00 pm ET.