IEEE P802.11
Wireless LANs

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| Minutes 802.11be PHY ad hoc – Interim meeting January 2021 |
| Date: 2021-01-13 |
| Author(s): |
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Abstract

This document contains the PHY ad hoc meeting minutes for TGbe teleconferences held during the January 2021 802.11 Interim Session:

* Jan 11, 2021
* Jan 13, 2021

**Monday Jan 11th 2021, 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 11-20/1983r2.
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. Discussions on the agenda.

**Agenda**

* **Technical Submissions: Run SPs from Previous Topics**
	+ 1880r0 SR field in TB PPDU Ron Porat
* **Technical Submissions: Proposed Draft Text (PDTs) for fixings TBDs**
	+ [1963r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1963-01-00be-resolve-some-phy-tbds-in-d0-2.docx) Resolve some PHY TBDs in D0.2 Bin Tian
	+ [1340r6](https://mentor.ieee.org/802.11/dcn/20/11-20-1340-06-00be-pdt-phy-packet-extension.docx) PDT-PHY-Packet Extension Yan Zhang
	+ 1837r3 pdt-phy-rx-procedure Xiaogang Chen
	+ 1480r2 Spectrum\_Flatness Xiaogang Chen
	+ 0049 PDT PHY Update to Preamble U-SIG for D0.3 Sameer Vermani
	+ 1826r7 PDT Joint Spatial Stream and MIMO Protocol Wook Bong Lee
* **Technical Submissions:**
	+ [0015r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0015-00-00be-clarification-of-80-mhz-operation-in-wider-bw-ofdma.pptx) Clarification of 80 MHz operation in wider-BW OFDMA Sigurd Schelstraete
	+ [1886r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1886-01-00be-ru-adaptation-in-tb-ul-mu-transmission.pptx) RU Adaptation in TB UL MU Transmission Yanyi Ding
	+ 0049r0 PHY update to preamble U-SIG for D0.3 Sameer Vermani
	+ 0012r0 Considerations on Open Issues PHY requirements Wook Bong Lee
	+ [0065r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0065-00-00be-spatial-reuse-fields-in-eht-preamble.pptx) Spatial Reuse Fields in EHT Preamble Alice Chen

**Deferred Straw Polls**

SP1: 20/1880r0 SR field in TB PPDU (Ron Porat)

* Do you support to have two SR fields (4 bits each, total 8 bits), with granularity of half PPDU BW, but no smaller than 20MHz, in the U-SIG of TB PPDU?
	+ Values in SR fields are defined same as in 11ax

Y/N/A: 43/0/9

**PDT Submissions**

**1963r1 Resolve some PHY TBDs in D0.2 (Bin Tian)**

SP2: Do you agree to include the spec text change in 20/1963r1 into D0.3?

No objection.

**1340r6 PDT-PHY-Packet Extension (Yan Zhang)**

SP3: Do you agree to include the spec text change in 20/1340r6 into D0.3?

No objection.

**1837r3 pdt-phy-rx-procedure (Xiaogang Chen)**

SP4: Do you agree to include the spec text change in 20/1837r4 into D0.3?

No objection.

SP8: Do you agree to include the spec text change in 20/1837r5 into D0.3?

No objection.

**1480r2 Spectrum\_Flatness (Xiaogang Chen)**

SP5: Do you agree to include the spec text change in 20/1480r3 into D0.3?

No objection.

**0049 PDT PHY Update to Preamble U-SIG for D0.3 (Sameer Vermani)**

SP6: Do you agree to include the spec text change in 20/0049r1 into D0.3?

No objection.

**1826r7 PDT Joint Spatial Stream and MIMO Protocol (Wook Bong Lee)**

SP7: Do you agree to include the spec text change in 20/1826r7 into D0.3?

No objection.

**Recess**

The meeting is recessed at 20:57 ET

**Wednesday Jan 13th 2021, 9:00 – 11:00 ET**

**Introduction**

1. The Chair (Tianyu Wu, Apple) calls the meeting to order at 9:00 ET.
2. The Chair follows the agenda in 11-20/1983r3.
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. Discussions on the agenda.

**Agenda**

* **Technical Submissions: Run SPs from Previous Topics**
* **Technical Submissions: Proposed Draft Text (PDTs) for fixings TBDs**
	+ 0012r0 Considerations on Open Issues PHY requirements Wook Bong Lee
	+ 0014r0 Proposed Draft Text (PDT-PHY): Modulation Accuracy
	+ 0013r0 Proposed Draft Text (PDT-PHY): Receive specification: General and receiver minimum input sensitivity and channel rejection Wook Bong Lee
	+ 0010 PDT-PHY: Preamble Puncture Update Oded Redlich
* **Technical Submissions:**
	+ [0015r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0015-00-00be-clarification-of-80-mhz-operation-in-wider-bw-ofdma.pptx) Clarification of 80 MHz operation in wider-BW OFDMA Sigurd Schelstraete
	+ [1886r1](https://mentor.ieee.org/802.11/dcn/20/11-20-1886-01-00be-ru-adaptation-in-tb-ul-mu-transmission.pptx) RU Adaptation in TB UL MU Transmission Yanyi Ding
	+ [0065r0](https://mentor.ieee.org/802.11/dcn/21/11-21-0065-00-00be-spatial-reuse-fields-in-eht-preamble.pptx) Spatial Reuse Fields in EHT Preamble Alice Chen
	+ 0089r0 EHT PPE Thresholds Field Follow-up Mengshi Hu

**PDT Submissions**

**0012r0 Considerations on Open Issues PHY requirements (Wook Bong Lee)**

Discussion of various issues w.r.t. LO requirement, EVM requirements, channel rejection, …

Discussion

Q: EVM in 11ax for 1024 QAM is a bit loose. For EHT, do we want stricter requirement?

A: maybe not. EVM measurement setup does not mention amplitude drift compensation.

A: need to specify both enabled and disabled for 11ax.

Q: with compensation it’s easier to meet requirements, this will make it more difficult.

A: if we just use -35 dB, vendor can still test with compensation on

Q: LO requirement does not depend on BW. Change in LO in 11ac relative to 11n was related to LO outside of packet BW. No reason to make it more stringent in 11be. Keep it at -32 dB.

A: this mean LO could be higher than data tone.

Q: for DUP mode at low SNR, we may not see all combining benefit, so not realistic to expected full 3 dB gain. Maybe take 1 dB margin.

Q: channel rejection may not scale linearly. Need time to check.

Q: 4k QAM we have even lower EVM requirement. We should make EVM for 1K stricter, so it’s OK to remove drift compensation.

SP1:

SP1 in 0012r1:

Do you support:

For 320 MHz transmission, the power measured at the location of the RF LO using resolution BW 78.125 kHz shall not exceed the maximum of -32 dB relative to the total transmit power and -20 dBm, or equivalently max(P-32,-20).

Results

Y/N/A: 30/0/10

SP2:

SP2 in 0012r1

Do you support a single EVM requirement for 1024 QAM?

* An EVM requirement for 1024 QAM: -35 dB

Results:

Y/N/A: 34/0/5

SP3:

SP3 in 0012r1

Do you support the same EVM requirement for BPSK, BPSK-DCM and BPSK-DCM-DUP in EHT MU PPDU?

* An EVM requirement for BPSK-DCM-DUP in EHT MU PPDU: -5 dB
* An EVM requirement for BPSK-DCM-DUP in EHT TB PPDU: N/A

Results

Y/N/A: 33/0/7

SP4:

SP4 in 0012r1

Do you support following minimum sensitivity levels for 4K QAM and BPSK-DCM-DUP?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Modulation | Rate | 20 MHz | 40 MHz | 80 MHz | 160 MHz | 320 MHz |
| 4096-QAM | 3/4 | –49  | –46 | –43 | –40 | –37 |
| 4096-QAM | 5/6 | –46  | –43 | –40 | –37 | –34 |
| BPSK-DCM | 1/2 | –82 | –79 | –76 | –73 | –70 |
| BPSK-DCM-DUP | 1/2 | N/A | N/A | –78  | –75 | –72 |

Results:

Y/N/A: 38/0/3

**0014r1 Proposed Draft Text (PDT-PHY): Modulation Accuracy (Wook Bong Lee)**

Text proposal capturing agreements from 0012r1

SP5:

Do you agree to accept the proposed text in 0014r1 for 11be D0.3?

No objection

**0013r2 Proposed Draft Text (PDT-PHY): Receive specification: General and receiver minimum input sensitivity and channel rejection (Wook Bong Lee)**

SP6:

Do you agree to accept the proposed text in 0013r2 for 11be D0.3?

No objection

**0010 PDT-PHY: Preamble Puncture Update (Oded Redlich)**

Addressing TBDs in D0.2

SP7:

Do you agree to accept the proposed text in 0010r1 for 11be D0.3?

No objection

**0015r0 Clarification of 80 MHz operation in wider-BW OFDMA (Sigurd Schelstraete)**

Discusses two issues related to 80 MHz operating STA in non-primary 80 MHz.

The main question is about preamble processing for an 80 MHz STA operating in a non-primary 80 MHz.

SP8:

SP1 in 0015r1

**With regards to puncturing, which approach do you prefer for 80 MHz STAs operating in a non-primary 80 MHz channel, if such operation is defined?**

* Option 1: STA autonomously finds a 20 MHz channel that is not punctured, without explicit information
* Option 2: Disallow puncturing in non-primary 80 MHz of wider band OFDMA transmission that includes 80 MHz-operating STAs in the non-primary 80 MHz
* Option 3: Provide a “guaranteed non-punctured” 20 MHz channel for 80 MHz-operating STAs in the non-primary 80 MHz

**NOTE: SP for information only, not for SFD**

Results

Option 1/ Option 2/ Option 3: 7/3/42

**1886r1 RU Adaptation in TB UL MU Transmission (Yanyi Ding)**

Whole allocated large-size RU/MRU is wasted even if only a small number of 20MHz subchannels are detected as busy, which would degrade system throughput. A mechanism is proposed to avoid such waste: STA may adapt allocated RU/MRU according to the state of medium.

Discussion

Q: could this create issues for preamble processing if STA changes the RU?

A: we have a number of options

Q: should AP detect this?

A: AP will detect signal in all 20 MHz channels

Q: could be considered for R2

A: not sure if it’s R1 or R2

Q: signaling is premature, would be better for R2. Tx doesn’t know if it’s MU-MIMO or not.

A: signaling from AP is needed to indicate whether adaptation is enabled.

Q: if using explicit signaling, then only one STA can be allocated to RU/MRU, with restrictions.

Q: also allowed to change other parameters?

A: open to that.

SP9:

SP1 in 1886r1

Do you think that further investigation on RU adaptation concept for TB UL transmission should be considered?

Note: not for SFD

It is for R2.

Results:

Y/N/A: 27/8/26

[**0065r0**](https://mentor.ieee.org/802.11/dcn/21/11-21-0065-00-00be-spatial-reuse-fields-in-eht-preamble.pptx) **Spatial Reuse Fields in EHT Preamble (Alice Chen)**

SR fields in EHT MU PPDU: propose to reuse 11ax encoding table.

SP10:

SP1 in 0065r0

Do you support to reuse the 11ax encoding table for the SR field in HE SU/MU PPDU for the SR field in the EHT-SIG of EHT MU PPDU?

Discussion:

Q: there are many reserved entries. Should they be Validate or Discard?

A: Validate or Discard is only of intended receivers. This is more intended for OBSS.

Results:

Y/N/A: 45/0/8

**Adjourn**

The meeting is adjourned 10:50 ET