IEEE P802.11
Wireless LANs

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| Minutes for 802.11 bn PHY ad-hoc in September 2025 Interim session |
| Date: 2025-09-15 |
| Author(s): |
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Abstract

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

* Tuesday AM2, September 16, 2025
* Thursday AM1, September 18, 2025 (Cancelled)

## Tuesday September 16th, 2024 10:30 – 12:30 Hawaii time

**Introduction**

1. The Chair (Tianyu, Apple) calls the meeting to order at 10:30am Hawaii time.
2. The Chair follows the agenda in 11-25/**1432r1**.
3. Reminder for registration for the Interim meeting.
4. The Chair reminds everyone to report their attendance by using IMAT system and by sending an e-mail to the Co-chair, Dongguk Lim (LGE), Sigurd Schelstraete (MaxLinear) or the Chair himself if unable to record attendance via IMAT system.
5. The Chair goes through the IPR policy and asks if anyone is aware of any potentially essential patents. **Nobody speaks up.**
6. The Chair goes through the Copyright policy.
7. Discussions on the agenda.

25/1176 Unused tone EVM for DRU (update) Lin Yang

25/1608 A Simple Procedure to Determine Co-BF Sync-reference and Sync-follower Roles Shuling Feng

25/1609 2x LDPC Usage at Shared AP for CoBF Sameer Vermani

25/1534 Discussion on N\_UHR-LTF for DRU Transmission Eunsung Park

25/1621 LTF Design for Co-SR Channel Estimation Ying Wang

**Technical contributions**

1. **25/1176 Unused tone EVM for DRU (update) Lin Yang(Qualcomm)**

Discussions:

C: In slide 21, it is not clear whether unused tone is a tone within DBW or DRU

A: It is for each DRU. I will fix the text by adding “each”.

**SP1**

**Do you support to include the following?**

* Define the transmit constellation error in an UHR DRU TB PPDU for all MCSs to be the same as in an UHR RRU TB PPDU

**Results: No objection**

**SP2**

**Do you support to include the following?**

* Local oscillator leakage and its within ±3 neighboring subcarriers shall be excluded from the computation of the transmitter modulation accuracy test for DRU

**Results: No objection**

**SP3**

* **Do you support to include the following?**

DRU unused tone EVM requirement for the unused tones within DBW is given by

$$UnusedToneError\left(i\_{DRU26/52}\right)\leq max(ε-1,-38dB)$$

* + Where $ε$ is used tone EVM, $i\_{DRU26/52} $is index of other DRU26/52 than the transmitted in the same DBW
	+ Applicable to all DRUs
	+ EVM measurement over unused tones within DBW
	+ EVM measurement over each unused DRU26 for DBW20 and DBW40
	+ EVM measurement over each unused DRU52 for DBW60 and DBW80

**Results: No objection**

**SP4’ (Cleaner Version)**

* **Do you support to include the following into the 11bn SFD**

DRU unused tone EVM requirement for the unused tones outside DBW but within PPDU is given by

$$UnusedToneError\left(i\_{RRU242,  start}+m\right)\leq \left\{\begin{matrix}\begin{matrix}max\left(ε – DRU spreading gain, -38dB\right),\\max\left(ε-10– DRU spreading gain, -38dB\right),\end{matrix}&\begin{matrix}if -r\leq m\leq -1\\if -2r\leq m\leq -r-1\end{matrix}\\\begin{matrix}max\left(ε-20– DRU spreading gain, -38dB\right),\\-38dB,\end{matrix}&\begin{matrix}if -3r\leq m\leq -2r-1\\otherwise\end{matrix}\end{matrix}\right.$$

$$UnusedToneError\left(i\_{RRU242,  end}+m\right)\leq \left\{\begin{matrix}\begin{matrix}max\left(ε – DRU spreading gain, -38dB\right),\\max\left(ε-10– DRU spreading gain, -38dB\right),\end{matrix}&\begin{matrix}if 1\leq m\leq r\\if r+1\leq m\leq 2r\end{matrix}\\\begin{matrix}max\left(ε-20– DRU spreading gain, -38dB\right),\\-38dB,\end{matrix}&\begin{matrix}if 2r+1\leq m\leq 3r\\otherwise\end{matrix}\end{matrix}\right.$$

* + Where $ε$ is used tone EVM, r is number of DBW20 in the transmitting DBW, r=1 for DBW20, r=2 for DBW40, and r=4 for DBW80 and DBW60
	+ EVM measurement over unused tones outside of DBW but within PPDU
	+ DRU spreading gain is given by

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|  | **DRU Spreading Gain in dB** |
|  | DRU26 | DRU52 | DRU106 | DRU242 | DRU484 |
| DBW20 | 9 | 6 | 3 | N/A | N/A |
| DBW40 | 12 | 9 | 6 | 3 | N/A |
| DBW80 | N/A | 12 | 9 | 6 | 3 |
| DBW60 | N/A | 12 | 9 | 6 | N/A |

**Results: No objection**

**SP5**

**Do you support to add the following to 11bn SFD?**

The unused tone constellation error in an UHR DRU TB PPDU is define as:

$$UnusedToneError\_{RMS}\left(k\right)= \frac{1}{N\_{f}}\sum\_{i\_{f}=1}^{N\_{f}}\sqrt{\frac{\sum\_{i\_{s}=1}^{N\_{SYM}}\sum\_{i\_{sc}\in Ω\_{k}}^{}(I\_{u}(i\_{f},i\_{s},i\_{sc}))^{2}+(Q\_{u}(i\_{f},i\_{s},i\_{sc}))^{2}}{N\_{SYM}∙|Ω\_{k}|∙P\_{S}}}$$

where $Ω\_{k} $is a set of subcarriers for *k*-th

- 26-tone DRU (within 20MHz/40MHz DBW)

- 52-tone DRU (within 60MHz/80MHz DBW)

- 242-tone RRU (outside of DBW)

**Results: No objection**

1. **25/1608r0, A Simple Procedure to Determine Co-BF Sync-reference and Sync-follower Roles, Shuling (Julia) Feng (Mediatek)**

Discussions:

C: Which case do you recommend that the role of sync reference and follower keep?

A: It depends on the implementation.

C: What is an advantage of being a sync follower or reference?

A: For Co-BF sounding/transmission, we need to synchronize the carrier. It can be performed simply.

**SP 1**

**Do you support to use the following procedure to determine MAPC Co-BF sync-reference and sync-follower roles when Co-BF MAPC agreement is established or updated in 11bn?**

* A MAPC requesting AP indicates explicitly its sync-reference / sync-follower role in the MAPC Scheme Request Set field of the Co-BF profile in the MAPC Negotiation Request frame.
* A MAPC responding AP assumes the sync-follower / sync-reference role left by the requesting AP if it accepts the agreement establishment or agreement update.

Note: It’s recommended to keep a CoBF AP’s sync-reference/follower role semi-static, only **changes it** in Co-BF MAPC agreement update when necessary.

**Results: No objection**

1. **25/1609r0, “2x LDPC Usage at Shared AP for CoBF”, Sameer Vermani (Qualcomm)**

Discussions : No discussion

SP1

**Do you support adding the following rules for Co-BF in the TGbn spec in 37.15.2.1.4 Co-BF transmission procedure?**

* + If the minimum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame corresponds to Navbits > 3888 bits for a user of the coordinated AP, then the coordinated AP may indicate that 2xLDPC will be used for the user in the Co-BF Response frame.
	+ If the minimum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame corresponds to Navbits ≤ 3888 bits for a user of the coordinated AP, then the coordinated AP shall not indicate that 2xLDPC will be used for the user in the Co-BF Response frame.
	+ A coordinating AP shall not choose a value for the Length field in the L-SIG field of the Co-BF PPDU in the Co-BF Trigger frame that corresponds to a number of OFDM symbols in the Data field which is smaller than the minimum number of data OFDM symbols the coordinating AP had indicated in the Co-BF Invite frame

Note: These changes for the TGbn editor are reflected in word document below

<https://mentor.ieee.org/802.11/dcn/25/11-25-1670-00-00bn-2x-ldpc-related-spec-text-changes-for-cobf.docx>

**Results: No objection**

SP2

* **Do you support adding the following recommendation for COBF to the TGbn spec in 37.15.2.1.4 Co-BF transmission procedure?**
	+ To help the coordinated AP choose an appropriate LDPC codeword length, the minimum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame should be greater than or equal to 0.5 times the maximum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame.

Note: These changes for the TGbn editor are reflected in word document below

[**https://mentor.ieee.org/802.11/dcn/25/11-25-1670-00-00bn-2x-ldpc-related-spec-text-changes-for-cobf.docx**](https://mentor.ieee.org/802.11/dcn/25/11-25-1670-00-00bn-2x-ldpc-related-spec-text-changes-for-cobf.docx)

**Results: No objection**

1. **25/1534 Discussion on N\_UHR-LTF for DRU Transmission Eunsung Park(LG Electronics)**

Discussions:

C: I want to support option3 for backward capability with 11be.

A: Okay.

C: I slightly support option 4. The limitation of up to 4 is more consistent.

C: It supports 4 or 8 for hybrid mode, right?

SP1

* **Do you support the following for TGbn?**
	+ 6 N\_UHR-LTF is disallowed for a DRU transmission and a hybrid RRU and DRU transmission

**Results: No objection**

SP2

* **Do you support the following for TGbn?**
	+ For a hybrid RRU and DRU transmission, partial BW MU-MIMO is disallowed

**Results: No objection**

1. **25/1621 LTF Design for Co-SR Channel Estimation Ying Wang(InterDigital)**

Discussions:

C: It seems to require the change of existing EHT and UHR, and is complex.

A: Yes, many change needs to enable this MU-MIMO

C: I think maybe we keep this simple method for now. It can be discussed in the next generation.

A: Thanks for your comment.

**Recess**

The meeting is Recessed at 12:30pm Hawaii Time.

## Thursday September 18th, 2024 08:00 – 10:00 Hawaii time ( Cancelled)