IEEE P802.11
Wireless LANs

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| CR for 35.4.1 DL MU operation |
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 Abstract

This submission proposes resolutions for following CID received for TGbe CC34:

1087

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Some wording change based on offline comments.
* Rev 2: Change the text based on Draft 1.0.
* Rev 3: Correct some references to the sub clauses.
* Rev 4: Change the text based on offline/online feedback

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbe Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

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| **CID** | **Commenter** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1087 | Alfred Asterjadhi | 146.42 | 35.4 | Subclause for DL MU operation is missing. Several things need to be expanded in this case, such as support for EHT MU PPDU, 320 MHz, up to 16 SS, and other new PHY functionalities that are added to the PHY subclauses. Add necessary capability bits and MIB variables. | As in comment | Revised-Agree with the comment. Inherit the rules defined in 26.5.1 (HE DL MU operation) that can also be applied to EHT DL MU operation. Define some new rules to support EHT MU PPDU.TGbe editor:Please implement changes as shown in this document. |

***TGbe editor: Please note baselines are REVmd D5.0, 11ax D8.0 and 11be D0.4***

**26.5 MU operation**

**26.5.1 HE DL MU operation**

**26.5.1.1 General**

*Delete the fourth paragraph of 26.5.1.1:*

~~An AP shall not transmit an HE MU PPDU with an RU that is narrower than the PPDU bandwidth and that is allocated to more than one STA (DL MU-MIMO), unless the AP has received from each STA an HE Capabilities element with the Partial Bandwidth DL MU-MIMO subfield in the HE PHY Capabilities Information field equal to 1.~~

*Delete the last paragraph of 26.5.1.1:*

~~An AP shall not transmit an HE MU PPDU where the number of OFDM symbols in the HE-SIG-B field is
greater than 16 to a non-AP STA with a 20 MHz operating channel width.~~

*Insert the following text after 26.5.1.1:*

**26.5.1.1a Additional rules on an HE MU PPDU**

An AP shall not transmit an HE MU PPDU with an RU that is narrower than the PPDU bandwidth and that is allocated to more than one STA (DL MU-MIMO), unless the AP has received from each STA an HE Capabilities element with the Partial Bandwidth DL MU-MIMO subfield in the HE PHY Capabilities Information field equal to 1.

An AP shall not transmit an HE MU PPDU where the number of OFDM symbols in the HE-SIG-B field is
greater than 16 to a non-AP STA with a 20 MHz operating channel width.

**26.5.1.3 RU allocation in an HE MU PPDU**

*Delete the last paragraph of 26.5.1.3:*

~~An HE MU PPDU shall have a sufficient number of RUs allocated to users such that all of the following conditions are satisfied:~~

~~a) At least~~ *~~N~~* ~~× 4 × 26 subcarriers are modulated by the allocated RUs within the entire PPDU, where~~ *~~N~~* ~~is the number of 20 MHz subchannels that are not preamble punctured in the PPDU.~~

~~b) For each 20 MHz subchannel~~ *~~S~~* ~~within the bandwidth of the HE MU PPDU, at least 2 × 26 subcarriers are modulated by the allocated RUs in the 20 MHz subchannel~~ *~~S~~* ~~if all of the following are true:~~

~~1) At least one RU is allocated in the 20 MHz subchannel~~ *~~S~~*~~.~~

~~2) Transmitter is an AP.~~

~~3) The AP is operating in an operating class for which the behavior limits set listed in Annex E includes the DFS\_50\_100\_Behavior.~~

~~4) The AP has received at least one Beacon frame from OBSS~~ *~~B~~* ~~within the past dot11ObssNbRuToleranceTime in the current operating channel in which any of the following are true:~~

~~i) The Extended Capabilities element is not present.~~

~~ii) The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field in the Extended Capabilities element is not present.~~

~~iii) The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field in the Extended Capabilities element is 0.~~

~~5) The 20 MHz subchannel~~ *~~S~~* ~~overlaps with the operating bandwidth of the OBSS~~ *~~B~~*~~.~~

~~c) At least one RU is allocated in the primary 20 MHz.~~

*Insert the following text after 26.5.1.3:*

**26.5.1.3a Minimum RU allocation in an HE MU PPDU**

An HE MU PPDU shall have a sufficient number of RUs allocated to users such that all of the following conditions are satisfied:

a) At least *N* × 4 × 26 subcarriers are modulated by the allocated RUs within the entire PPDU, where *N* is the number of 20 MHz subchannels that are not preamble punctured in the PPDU.

b) For each 20 MHz subchannel *S* within the bandwidth of the HE MU PPDU, at least 2 × 26 subcarriers are modulated by the allocated RUs in the 20 MHz subchannel *S* if all of the following are true:

1) At least one RU is allocated in the 20 MHz subchannel *S*.

2) Transmitter is an AP.

3) The AP is operating in an operating class for which the behavior limits set listed in Annex E includes the DFS\_50\_100\_Behavior.

4) The AP has received at least one Beacon frame from OBSS *B* within the past dot11ObssNbRuToleranceTime in the current operating channel in which any of the following are true:

i) The Extended Capabilities element is not present.

ii) The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field in the Extended Capabilities element is not present.

iii) The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field in the Extended Capabilities element is 0.

5) The 20 MHz subchannel *S* overlaps with the operating bandwidth of the OBSS *B*.

c) At least one RU is allocated in the primary 20 MHz.

**35.4.1 EHT DL MU operation**

***TGbe editor: Please update the subclause as shown below***

**35.4.1.1 General**

When transmitting or receiving an EHT MU PPDU, the rules defined in 26.5.1.1 (General), 26.5.1.2 (RU addressing in an HE MU PPDU) and 26.5.1.3a (Minimum RU allocation in an HE MU PPDU) that apply to an HE MU PPDU shall also apply to an EHT MU PPDU. In cases where a rule in 26.5.1.1 (General), 26.5.1.2 (RU addressing in an HE MU PPDU) or 26.5.1.3a (Minimum RU allocation in an HE MU PPDU) refers to RUs in an HE MU PPDU, the rule applies to RUs and MRUs in an EHT MU PPDU.

An EHT AP shall not transmit an EHT MU PPDU with an RU that is narrower than the PPDU bandwidth and that is allocated to more than one STA (DL MU-MIMO) unless the AP has received from each STA an EHT Capabilities element with the Partial Bandwidth DL MU-MIMO subfield in the EHT PHY Capabilities Information field equal to 1.

**35.4.1.2 RU allocation in an EHT MU PPDU**

An EHT STA shall not transmit a 320 MHz EHT MU PPDU in the 6 GHz band with a 2x996+484-tone, 3x996-tone, 3x996+484-tone or 4x996-tone RU or MRU allocated to the other EHT STA, unless the EHT STA has received an EHT Capabilities element with the Support For 320 MHz In 6 GHz subfield in the EHT PHY Capabilities Information field equals to 1 from the other EHT STA and the other EHT STA is in 320 MHz operating bandwidth.

A non-AP EHT STA with dot11EHTSupportFor242ToneRUInBWWiderThan20Implemented equal to false shall set the Support For 242-tone RU In BW Wider Than 20 MHz subfield in the EHT PHY Capabilities Information field in the EHT Capabilities element to 0.

An AP shall not transmit a 40 MHz, 80 MHz, 160 MHz, or 320 MHz EHT MU PPDU with a 242-tone RU allocated to a 20 MHz operating non-AP EHT STA, unless the AP has received from the 20 MHz operating non-AP EHT STA an EHT Capabilities element with the Support For 242-tone RU In BW Wider Than 20 MHz subfield in the EHT PHY Capabilities Information field equals to 1.

An AP shall follow the RU restriction rules defined in 36.3.2.6 (RU and MRU restrictions for 20 MHz operation) when assigning an RU or MRU to a 20 MHz operating non-AP STA in a 40 MHz, 80 MHz, 160 MHz, or 320 MHz EHT MU PPDU. An AP shall follow the rules in 36.3.2.5 (20 MHz operating non-AP EHT STAs), 36.3.2.7 (80 MHz operating non-AP EHT STAs) and 36.3.2.8 (160 MHz operating non-AP EHT STAs) if allocating RUs or MRUs to an non-AP EHT STA whose operating bandwidth is smaller than the BSS operating channel width.

**Straw Poll: Do you support to incorporate the proposed draft text in this document 11-21/0538r5 to the next revision of TGbe Draft?**

**Result: Yes/No/Abstain**