IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CR for CIDs related to EMLSR | | | | |
| Date: January 26, 2022 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Gaurang Naik | Qualcomm Inc. |  |  | gnaik@qti.qualcomm.com |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm Inc. |  |  | aasterja@qti.qualcomm.com |
| George Cherian | Qualcomm Inc. |  |  | gcherian@qti.qualcomm.com |
| Duncan Ho | Qualcomm Inc. |  |  | dho@qti.qualcomm.com |
| Yanjun Sun | Qualcomm Inc. |  |  | yanjuns@qti.qualcomm.com |
| Abdel Karim Ajami | Qualcomm Inc. |  |  | aajami@qti.qualcomm.com |
| Minyoung Park | Intel |  |  |  |

Abstract

This submission proposes resolutions for 8 CIDs received for TGbe CC36:

SP: Do you agree to the resolutions provided in doc 11-22/0222r0 for the following CIDs for inclusion in the latest 11be draft?

5451, 8048, 6324, 4421, 7467, 8356, 4699, 6069

**Revisions:**

* Rev 0: Initial version of the document.

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Section** | **Pg.Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 5451 | Jian Yu | 35.3.15 | 281.36 | There is no OFDM PPDU | Clarify what does OFDM PPDU mean, non-HT PPDU or something else | **Revised**  Disagree with the comment. In TGme D1.0, the OFDM PPDU is defined as follows: “**orthogonal frequency division multiplexing (OFDM) physical layer (PHY) protocol data unit (PPDU):** A Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) PPDU.”  However, since the text limits the rates to be 6, 9, 12,and 24 Mbps, we can safely replace OFDM PPDU with non-HT PPDU.  **TGbe editor: Please implement the changes shown in doc 11-22/0222r0 tagged as #5451** |
| 8048 | Yuchen Guo | 35.3.15 | 281.36 | "non-HT PPDU" is a better term than "OFDM PPDU" since it's more widely used in the SPEC text | change "OFDM PPDU" to "non-HT PPDU" | **Accepted** |
| 6324 | Ming Gan | 35.3.15 | 281.40 | Please change "mandatory" to its corresponding normative behavior | as in the comment | **Revised**  Normative behavior was added in Clause 35.3.16 to indicate that reception of MU-RTS and BSRP is mandatory while the non-AP MLD is in the listening operation of the EMLSR mode.  **TGbe editor: Please implement the changes shown in doc 11-22/0222r0 tagged as #6324** |
| 4421 | Arik Klein | 35.3.15 | 281.40 | The sentence "Reception of MU-RTS and BSRP Trigger frames is mandatory for a non-AP MLD that is in the EMLSR mode" seems redundant, since all HE STA (and EHT STA) are required to receive MU-RTS and BSRP (which are 2 variants of Trigger frame). | Please remove the sentence "Reception of MU-RTS and BSRP Trigger frames is mandatory for a non-AP MLD that is in the EMLSR mode" | **Revised**  The cited statement refers to the ability of STAs of the non-AP MLD to receive the two frames while the non-AP MLD is in the EMLSR mode and in listening operation. This is different from the STAs’ ability to receive these two frames in other modes. Therefore, the statement is not redundant. The statement was revised to highlight the above.  **TGbe editor: Please implement the changes shown in doc 11-22/0222r0 tagged as #4421** |
| 7467 | Thomas Handte | 35.3.15 | 281.40 | "... that is in the EMLSR mode" Being in EMLSR mode is different than supporting this mode | "... that supports EMLSR mode" | **Rejected**  The cited statement refers to the ability of STAs of the non-AP MLD to receive the two frames while the non-AP MLD is in the EMLSR mode and in listening operation, which is applicable only when the non-AP MLD is operating in the EMLSR mode. A non-AP MLD may support the EMLSR mode but may not be operating in the EMLSR mode. The statement does not apply to such cases. |
| 8356 | Zhiqiang Han | 35.3.15 | 281.55 | "its spatial stream capabilities " is not clear, it means the total spatial stream capabilities of all links? | Please clarify it | **Revised**  Agree with the commenter in principle. The statement was revised to indicate that the spatial stream capabilities refer to its per-link capabilities.  **TGbe editor: Please implement the changes shown in doc 11-22/0222r0 tagged as #8356** |
| 4699 | Chien-Fang Hsu | 35.3.15 | 281.56 | "the more than one spatial stream" here is not clear. It should be specifed exactly how many spatial streams can be supported by a capability indication or other information announced in an element. Also, supported spatial streams should apply to all enabled links in EMLSR mode of the non-AP MLD | clarify the number of spatial stream can be supported | **Revised**  The statement was revised to indicate that the per-link spatial stream capabilities and the operating mode as indicated by the non-AP MLD dictate the exact number of spatial streams used by the AP MLD and non-AP MLD during frame exchanges.  **TGbe editor: Please implement the changes shown in doc 11-22/0222r0 tagged as #4699** |
| 6069 | Liwen Chu | 35.3.15 | 281.17 | It seems that the Nss of all links under eMLSR should have same Nss support. However since Nss is defined in different links and there is no Nss MCS support in eMLSR MLD level, an eMLSR can announce different Nss support for different links. This can help the case where different links have different requirement, e.g. avoiding interference of different radios in the device. | Make this clear through adding the text that an eMLSR MLD can announce the different Nss for different links. | **Revised**  The statement was revised to indicate that the per-link spatial stream capabilities and the operating mode as indicated by the non-AP MLD dictate the exact number of spatial streams used by the AP MLD and non-AP MLD during frame exchanges.  **TGbe editor: Please implement the changes shown in doc 11-22/0222r0 tagged as #4699** |

***TGbe editor: Please note Baseline is 11be D1.******31***

**35.3.16 Enhanced multi-link single radio operation**

When a non-AP MLD is operating in the EMLSR mode with an AP MLD supporting the EMLSR mode, the following applies:

…

* The initial Control frame of a frame exchange sequence shall be sent in the non-HT (#5451) PPDU or non-HT duplicate PPDU format using a rate of 6 Mbps, 12 Mbps, or 24 Mbps.
* The initial Control frame shall be an MU-RTS Trigger frame or a BSRP Trigger frame. A STA affiliated with a non-AP MLD that is in the listening operation and that receives an MU-RTS Trigger Frame or BSRP Trigger frame addressed to it shall respond as defined in 35.4.2.2 (Rules for soliciting UL MU frames) except when the frame exchanges initiated by the initial Control frame on one of the EMLSR links overlaps with group addressed frame transmissions on the other EMLSR link (#6324). The number of spatial streams for the response to the BSRP Trigger frame shall be limited to 1.
* …
* After receiving the initial Control frame of a frame exchange sequence, the non-AP MLD shall be able to transmit or receive on the link in which the initial Control frame was received and shall not transmit or receive on the other EMLSR link(s) until the end of the frame exchange sequence, and subject to its per-link (#8356) spatial stream capabilities (9.4.2.55.4(Supported MCS Set field), 9.4.2.157.3(Supported VHT-MCS and NSS Set field), 9.4.2.248.4(9.4.2.248.4 Supported HE-MCS And NSS Set field), and 9.4.2.313.4(9.4.2.313.4 Supported EHT-MCS And NSS Set field)) and operation mode (see 26.9 (Operating mode indication)) (#4699), and link switch delay, the non-AP MLD shall be capable of receiving a PPDU that is sent using more than one spatial stream on the link in which the initial Control frame was received a SIFS after the end of its response frame transmission solicited by the initial Control frame. During the frame exchange sequence, the AP MLD shall not transmit frames to the non-AP MLD on the other EMLSR link(s). The non-AP MLD switches back to the listening operation on the enabled links immediately after the end of the frame exchange sequence.

NOTE – If a non-AP MLD updates its operation mode and indicates it only supports one spatial stream, an AP MLD follows the updated operation mode and transmits a PPDU with one spatial stream after receiving an immediate response frame following the initial Control frame (#4699).