IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TGbe LB 266 CR for CIDs for STR Operation** | | | | |
| Date: 2022-09-02 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Insun Jang | LG Electronics | 19, Yangjae-daero 11gil, Seocho-gu, Seoul 137-130, Korea |  | insun.jang@lge.com |
| Sunhee Baek |  | sunhee.baek@lge.com |
| Jinsoo Choi |  | js.choi@lge.com |

Abstract

This submission proposes resolutions for following 18 CIDs received for TGbe LB266:

10004, 10501, 10782, 11263, 11573, 12222, 12658, 13700, 13926, 13804, 11574, 11575, 12359, 13395, 10500, 14013, 12220, 11960

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised from offline feedback for exceptions of STR operation
* Rev 2: NOTE is revised based on the feedback in the ad-hoc call

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.***

**List of CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 10004 | Robert Sosack | 35.3.16.3 | 453.44 | On this line "the NSTR link pair if there exists at least on NSTR link pair as defined in 35.3.16.2" there is a missing "e" in the word "one". | Change "on" to "one". | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 10501 | Eldad Perahia | 35.3.16.3 | 453.44 | "at least on NSTR link" | "one" | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 10782 | Dennis Sundman | 35.3.16.3 | 453.44 | Missing an "e" in one | Change "...exists at least on NSTR link pair..." with "...exists at least one NSTR link pair..." | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 11263 | Sigurd Schelstraete | 35.3.16.3 | 453.44 | Change "at least on" to "at least one" | See comment | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 11573 | Xiaofei Wang | 35.3.16.3 | 453.44 | "on" should be "one" | as in comment | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 12222 | Stephen McCann | 35.3.16.3 | 453.44 | typo "at least on NSTR link pair" | change to "on" to "one" | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 12658 | Arik Klein | 35.3.16.3 | 453.43 | Typo: should replace "on" with "one" or " a single" in the following sentence: "A non-AP MLD shall announce whether each pair of links where the MLD operates is the STR link pair or the NSTR link pair if there exists at least \*on\* NSTR link pair as defined in 35.3.16.2 (Multi-link device capability and operation signaling)" | The correct sentence shall be: "A non-AP MLD shall announce whether each pair of links where the MLD operates is the STR link pair or the NSTR link pair if there exists at least \*one / a single\* NSTR link pair as defined in 35.3.16.2 (Multi-link device capability and operation signaling)" | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 13700 | Yunbo Li | 35.3.16.3 | 453.44 | "at least on" --> "at least one" | Change "at least on" to "at least one". | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 13926 | Ming Gan | 35.3.16.3 | 453.44 | this should be with respect to some certain link since NSTR link pair present subfield is in STA control subfield of ML element | update the text | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 13804 | Yuchen Guo | 35.3.16.3 | 453.40 | the word "operates" is not needed | delete "operates" | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 11574 | Xiaofei Wang | 35.3.16.3 | 453.43 | "the STR link pair" should be "an STR link pair" | as in comment | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 11575 | Xiaofei Wang | 35.3.16.3 | 453.44 | not clear to which pair "the NSTR link pair" refers; | as in comment | Revised  **Incorporate the changes as shown in 11-22/1239r3 (**<https://mentor.ieee.org/802.11/dcn/22/11-22-1239-03-00be-lb266-cr-for-35-3-16-4.docx>**).**  **Note to the Editor:**  The identified statement was removed in the approved document 11-22/1239r3. No further changes are required for the resolution of this CID in this document. |
| 12359 | Massinissa Lalam | 35.3.16.3 | 453.37 | This part "except as specified in 35.3.16.4 (Nonsimultaneous transmit and receive (NSTR) operation)." should be deleted. This subclause describes STR operation. WM access is indenpendent on each link in STR, I don't see any exception in the NSTR subclause pertaining to STR links | As in comment | Revised  Even though the MLD operates on STR link pair, the corresponding link pair on which another MLD (e.g., receiver) may be an NSTR link pair. Therefore, we need the exception of NSTR operation.  Meanwhile, if we have multiple exceptions currently and further ones in the furture MLO, it is better to say in general instead of explicitly stated for all specific subclauses. Therefore, it was changed to “unless explicitly stated otherwise”  **TGbe editor, please make changes as shown in doc 11-22/1400r1 tagged as CID 12359** |
| 13395 | Liwen Chu | 35.3.16.3 | 453.33 | The eMLSR also has some restriction. The exception should inclue it. | Fix the issues mentioned in the comment | Revised  Agree in principle with the commenter. On EMLSR links, listening operation on each link is independent, but after that, the frame exchange is limited to only one link depending on the listening on each link, which can be exceptional operations. Similarly, EMLMR operation can be another exception.  Relevant texts in D2.1.1:  *“After receiving the initial Control frame of frame exchanges and transmitting an immediate response frame as a response to the initial Control frame, a STA affiliated with the non-AP MLD that was listening on the corresponding link shall be able to transmit or receive frames 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 exchanges,,”*  Meanwhile, if we have multiple exceptions currently and further ones in the furture MLO, it is better to say in general instead of explicitly stated for all specific subclauses. Therefore, it was changed to “unless explicitly stated otherwise”  **TGbe editor, please make changes as shown in doc 11-22/1400r1 tagged as CID 13395** |
| 10500 | Eldad Perahia | 35.3.16.3 | 453.40 | "All pairs of links where an AP MLD that is not an NSTR mobile AP MLD operates shall be STR link pairs." Clarify language for a single link. | as in comment | Revised  Agree in principle with the commenter. The revised text provides a Note regarding the case where an AP MLD has only one link by referring the spec text for case of AP removal.  Relevant texts:  *“If an AP affiliated with an AP MLD is removed, any STR or NSTR requirements and capabilities that correspond to a link pair that includes the link corresponding to the removed AP shall no longer apply”*  In addition, to align with the added NOTE, the cited text was revised.  **TGbe editor, please make changes as shown in 22/1400r1 under CID 10500** |
| 14013 | Sanghyun Kim | 35.3.16.3 | 453.31 | An STR link pair of a non-AP MLD may become an NSTR link pair after channel switching indicated by the AP MLD. It is unclear what the non-AP MLD should do in this situation, if the non-AP MLD does not support the NSTR operation. It is recommended to provide some operating options such as 'disassociate one of the link among the NSTR link pair', 'convert the operating mode of the STAs operating on the NSTR link pair to EMLSR mode(if applicable)'. | As in comment. | Rejected  That issue would depend on the STA’s choice. We can refer to the following text  *“When a STA with dot11DSERequired equal to false receives an Extended Channel Switch Announcement*  *element, it may choose not to perform the specified switch, but to take alternative action”*  *(Same as channel switch announcement)*  In addition, for the recommended operations,  - We don’t have the disassociation of only one link for MLD, instead “MLD association” through ML teardown  - EMLSR mode is optional, which cannot always work |
| 12220 | Stephen McCann | 35.3.16.3 | 453.33 | An MLD should not be constrained to have a STR link pair. It should be able to have as many STR links as it wishes. Therefore this paragraph sshould be re-written to allow an MLD to have as many STR links as it wishes. The title of Figure 35-19 should also be changed. | Commenter will provide a submission | Rejected  Basically the STR or NSTR operations have to be described for multiple links (not one link) for which such requirements are not applied to one link. In addition, it is proper to define the operations/rules per a pair and it (a pair) has been also widely used in the current draft.  Also, we already had the pair-specific signaling (for non-AP MLD) to indicate STR or NSTR capabilities (one link to another link) |
| 11960 | Jarkko Kneckt | 35.3.16.3 | 453.38 | In some cases, a STR STA may have buffered UL data on a single TID. The STA may be transmitting UL data on the TID and during this operation it may receive a trigger frame. The response to such a Trigger frame is complicated to organize in STA and it requires a lot of real time scheduling. Sometimes, the STA may not be able to send data as a response to the Tirgger frame. | Please add a note to explain STR STA difficulties to respond to a Trigger frame if it has UL data only on a TID and if the STA is currently transmitting data on otehr link. The note should explain that in these cases the STA may send as a response to a basic Trigger frame QoS Null frames with BSR A-Control field signaling available buffered UL frames on the TID. The AP should consider that it should continue to trigger the STA for the buffered traffic, but the STA was not able to respond to the Trigger frame. | Revised  Agree in principle with the commenter. The revised text added a NOTE considering the case by the commenter.  **TGbe editor, please make changes as shown in 22/1400r1 under CID 11960** |

**Proposed spec text:**

***TGbe editor: The baseline for this document is 11be D2.1.1***

***TGbe editor: Please modify the subclause 35.3.16.3 (Simultaneous transmit and receive (STR) operation) as follows:***

35.3.16.3 Simultaneous transmit and receive (STR) operation

When a pair of links on which an MLD operates is an STR link pair, a STA that is affiliated with the MLD and that is operating on a link in that STR link pair shall access the WM on that link by following the rules defined in 10.3 (DCF) and 10.23.2 (HCF . based channel access (EDCA)) regardless of any activity occurring on the other link within that STR link pair (#12359, #13395), unless explicitly stated otherwise.

(#11960)NOTE –A STA affiliated with a non-AP MLD operating on an STR link pair might send a QoS-Null frame with a BSR indicating buffered traffic if it is not able to send data from a TID as a response to Trigger frames.

(#10500)All pairs of links for an AP MLD that is not an NSTR mobile AP MLD and that operates on more than one link shall be STR link pairs.

(#10500)NOTE - If an AP MLD that is not an NSTR mobile AP MLD operates on only one link, any STR requirements and capabilities that correspond to a link pair no longer apply.

Figure 35-20 (Channel access of two MLDs over an STR link pair) shows an example of an AP MLD and a non-AP MLD that are operating over an STR link pair and that are contending for access to the WM and subsequent frame exchanges between two MLDs on those links. After the AP MLD has performed a multi-link setup with the non-AP MLD to set up link 1 and link 2 successfully and the links are enabled, then AP 2 may receive data frames from STA 2 on link 2, while AP 1 contends for the WM and then transmits data frames to STA 1 on link 1 after it obtains a TXOP.