IEEE P802.11
Wireless LANs

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| **TGbe D1.0 Comment Resolutions****for simultaneous trnamist and receive (STR) operation** |
| **Date:** 2021-09-24 |

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Abstract

This submission proposes resolutions for multiple comments on TGbe D1.0 regarding simultaneous trnamist and receive (STR) operation with the following CIDs (24 **CIDs**):

* 4925, 5840, 7062, 4214, 7855, 4470, 6985, 7516, 4401, 6852, 4471, 4750, 6986, 7517, 4472, 4724, 6140, 6853, 5839, 6309, 6493, 4725, 4215, 7610

Revisions:

- Rev 0: Initial version of the document.

- Rev 1: Editorial changes and added co-authors as commenters

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 1.2. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft 1.2 (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** |
| 4925 | Eldad Perahia | 3.1 | 37.18 | There is a definition for NSTR, but not STR. | Add definition for STR | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The definition of STR link pair was added during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 5840 | Lei Wang | 35.3.14.2 | 274.28 | The concept of STR link pair should be defined clearly in Section 35.3.14.2 and also include its definition in Section 3.1. | Provide a clear definition of "simultaneous transmit and receive (STR) Link pair" in Section 35.3.14.2, and also add such definition in Section 3.1. | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The definition of STR link pair was added during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 7062 | Sigurd Schelstraete | 35.3.14.2 | 274.29 | "capable of STR over a pair of links". I couldn't find an actual defintion of "STR" up to this point. | Add working definition of STR. Something like "A STA is STR capable on a pair of links if reception on one link is not affected by transmission on the other link" | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The definition of STR link pair was added during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 4214 | Alfred Asterjadhi | 35.3.14.1 | 274.23 | ?Is allowed to contend" or "shall contend" I am guessing the latter.Similar observation for Line 30 of same page. Also there is more than one subclause. So replace subclause with subclauses at the end of the sentence. | As in comment. | RevisedAgree in principle with the commenter. The revised text provides the changes according to the comment.**TGbe editor, please make changes as shown in doc 11-21/1300r1 tagged as CID 4214.** |
| 7855 | Yonggang Fang | 35.3.14.1 | 274.24 | As there are two subclauses below, It needs clearly specify which subclause is applicable in the following sentence "An STA, which is affiliated with an MLD, is allowed to contend for the WM on its link independently from the other STA(s) affiliated with the same MLD, unless explicitly stated otherwise in the subclause below." | See the comment. | RevisedAgree in principle with the commenter. The revised text provides the changes “subclause” to “subclauses” to refer to multiple ones.**TGbe editor, please make changes as shown in doc 11-21/1300r1 tagged as CID 4214** |
| 4470 | Arik Klein | 35.3.14.1 | 274.22 | Replace "An" with "A" in the following sentence:"An STA, which is affiliated with an MLD.." | As in comment | Accepted**TGbe editor, please make changes as shown in doc 11-21/1300r1 tagged as CID 4470.** |
| 6985 | Sanghyun Kim | 35.3.14.1 | 274.23 | Type 'An STA' | Change 'An STA' to 'A STA' | Accepted**TGbe editor, please incorporate the changes as shown in 21/1300r1 under CID 4470.** |
| 7516 | Tomoko Adachi | 35.3.14.1 | 274.23 | "An STA, which is affiliated with an MLD, is allowed to ...". For the term "STA", indefinite "a" is used. | Change it to read "A STA, which is affiliated with an MLD, is allowed to ...". | Accepted**TGbe editor, please incorporate the changes as shown in 21/1300r1 under CID 4470.** |
| 4401 | Arik Klein | 35.3.14.2 | 274.30 | It seems that there is duplication in the following sentence : "....may contend for access to WM or transmit a frame to an STA of another MLD capable of STR over that pair of links on that link regardless of any activity ..." - transmission of a frame is always done following a contention for the WM. | 2 options to resolve the sentence:Option 1 - if "transmission" refers to initiated transmission - please remove it from the sentence, as follows: " may contend for access to WM on that link regardless of any activity..."Option 2 -if "transmission" refers to response frame transmission - please add it to the text, as follows: "....may contend for access to WM or transmit a \*response\* frame to an STA of another MLD capable of STR over that pair of links on that link regardless of any activity ..." | Revised**Incorporate the changes (similar to Option 1) as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement (…shall access the WM…) was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 6852 | Rubayet Shafin | 35.3.14.2 | 274.30 | In "... transmit a frame to an STA of another MLD..."; this terminology is not aligned with general language agreed on. | Please change "STA of another MLD" to "STA affiliated with another MLD" | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 4471 | Arik Klein | 35.3.14.2 | 274.29 | Replace "An" with "A" and Rephrase the following sentence for clarity: "An STA that is affiliated with an MLD capable of STR over a pair of links and that is operating on a link in that pair of links may..." | Revise the sentence as follows:" A STA that is affiliated with an MLD \*which is \*capable of STR over a pair of links and is operating on a link in that pair of links may..." | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 4750 | Chunyu Hu | 35.3.14.2 | 274.29 | "An STA" ==> "A STA". | As commented | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 6986 | Sanghyun Kim | 35.3.14.2 | 274.28 | Type 'An STA' | Change 'An STA' to 'A STA' | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 7517 | Tomoko Adachi | 35.3.14.2 | 274.29 | "An STA that is affiliated with an MLD capable of STR ... or transmit a frame to an STA of another MLD capable of STR ...". For the term "STA", indefinite "a" is used. | Change it to read "A STA that is affiliated with an MLD capable of STR ... or transmit a frame to a STA of another MLD capable of STR ...". | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 4472 | Arik Klein | 35.3.14.2 | 274.38 | typo - please replace "contenting" with "conteding" in the following sentence: "Figure 35-11 ... are operating as STR over a pair of links and that are \*contenting\* for access to the WM and subsequent frame exchanges between two MLDs on those links. " | As in comment | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 4724 | Chittabrata Ghosh | 35.3.14.2 | 274.38 | The word "contenting" should be replaced by "contending" in the quoted sentence: "Figure 35-11 (Channel access of two MLDs operating as STR over a pair of links) shows an example of an AP MLD and a non-AP MLD that are operating as STR over a pair of links and that are contenting for access to the WM and subsequent frame exchanges between two MLDs on those links." | Replace "Figure 35-11 (Channel access of two MLDs operating as STR over a pair of links) shows an example of an AP MLD and a non-AP MLD that are operating as STR over a pair of links and that are contenting for access to the WM and subsequent frame exchanges between two MLDs on those links." with "Figure 35-11 (Channel access of two MLDs operating as STR over a pair of links) shows an example of an AP MLD and a non-AP MLD that are operating as STR over a pair of links and that are contending for access to the WM and subsequent frame exchanges between two MLDs on those links." | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 6140 | Matthew Fischer | 35.3.14.2 | 274.39 | spelling error | Change "contenting" to "contending" | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 6853 | Rubayet Shafin | 35.3.14.2 | 274.40 | Typo "and that are contenting" | Please change the word 'contenting' to 'contending'. | Revised**Incorporate the changes as shown in 11-21/0498r4 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-0498-04-00be-cr-for-cids-related-to-str-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The identified statement was revised during CC34 in the approved document 11-21/498r4. No further changes are required for the resolution of this CID in this document. |
| 5839 | Lei Wang | 35.3.14.2 | 274.26 | The concept of STR is pretty generic, while the STR in Section 35.3.14.2 is specific to Multi-Link STR. Suggest naming the section accordingly. | Suggest changing the section title for 35.3.14.2 to the following or something similar in order to better represent the section content:"Multi-Link Simultaneous transmit and receive (ML-STR) operation". | RejectedThis subcluase is under the 35.3.15. Multi-link channel access, which really implies that STR operation is involved in multi-link operation |
| 6309 | Ming Gan | 35.3.14.2 | 274.42 | what does "set up link 1 and link 2" mean? Is that multi-link association? Please make it clear | as in the comment | RevisedAgree in principle with the commenter. The revised text indicates a successuful multi-link setup to make it clear.**TGbe editor, please change the figure tagged as CID 6309 to a figure as shown in doc 11-21/1300r1** |
| 6493 | Osama Aboulmagd | 35.3.14.2 | 274.46 | Figure 35-11 is confusing especially the lower part of it. The sensing part (hashed) is not clear was conducted by whom. It is also not clear who sends the lower ACK. | redraw the Figure and add more explanation | RevisedAgree in principle with the commenter. The figure was revised to make it clear.**TGbe editor, please change the figure tagged as CID 6493 to a figure as shown in doc 11-21/1300r1**  |
| 4725 | Chittabrata Ghosh | 35.3.14.2 | 274.41 | It needs to clarify that AP 1 after contending, transmits data frames to STA 1 only after it wins channel access in the following sentence: "After the AP MLD has set up link 1 and link 2 with the non-AP MLD, 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." | Please replace the sentence "After the AP MLD has set up link 1 and link 2 with the non-AP MLD, 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." with "After the AP MLD has set up link 1 and link 2 with the non-AP MLD, 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 gains a TXOP." | RevisedAgree in principle with the commenter. The revised text provides the change to add “after it obtains a TXOP” to the last.**TGbe editor, please make changes as shown in doc 11-21/1300r1 tagged as CID 4725.** |
| 4215 | Alfred Asterjadhi | 35.3.14.1 | 274.36 | I think the subclause of capability signaling should follow the general subclause. And rest of them follows that. | As in comment. | Revised**Incorporate the changes as shown in 11-21/1259r3 (**[**https://mentor.ieee.org/802.11/dcn/21/11-21-1259-03-00be-cr-35-3-14-3-nstr-operation.docx**](https://mentor.ieee.org/802.11/dcn/21/11-21-1259-03-00be-cr-35-3-14-3-nstr-operation.docx)**). The changes also appear in D1.2****Note to the Editor:**The order of subclauses was changed in document 11-21/1259r3. No further changes are required for the resolution of this CID in this document. |
| 7610 | Tomoko Adachi | 35.3.14 | 0.00 | Too much mechanisms to support transmission between an NSTR link pair. I am skeptical if all these mechanisms will be really used. | Revisit the techniques and narrow down only to those that can be really expected to be implemented. | RejectedBasically, each subclause has touched really different cases which can happen and should be handled. Each case has a clear motivation/scenario, i.e., why we have to do that and implement. (e.g., channel access on STR/NSTR link pair, starting/ending time alignement on NSTR link pair) |

**Propose:**

***TGbe editor: Please note that the baseline is D1.2.***

***TGbe editor: Please note that the following definition is not for any comment resolution, just for the reference in this document.***

3.2 Definitions specific to IEEE 802.11

**simultaneous transmit and receive (STR) link pair:** A pair of links that is not a nonsimultaneous transmit and receive (NSTR) link pair.

**35.3.15 Multi-link channel access**

***TGbe editor: Please modify the subclause 35.3.15.1 (Gneral), as follows:***

**35.3.15.1 General**

(#4470)A STA, which is affiliated with an MLD, (#4214)shall contend for the WM on its link independently from the other STA(s) affiliated with the same MLD, unless explicitly stated otherwise in the (#4214)subclauses below.

***TGbe editor: Please modify the subclause 35.3.13.3 (Simultaneous transmit and receive (STR) operation), as follows:***

35.3.15.3 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 contention based channel access (EDCA)) regardless of any activity occurring on the other link within that STR link pair, except as specified in 35.3.15.3 (Nonsimultaneous transmit and receive (NSTR) operation).

All pairs of links where an AP MLD that is not an NSTR soft AP MLD operates shall be STR link pairs.

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 35.3.15.4 (Multi-Link device Capability signaling).

Figure 35-14 (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 (#6309) 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 (#4725)after it obtains a TXOP.

***TGbe editor: Please change Figure 35-14 in D1.2 to the following figure***



**(#6493)Figure 35-14—Channel access of two MLDs over an STR link pair**