**IEEE P802.11
Wireless LANs**

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| LB266 CR for ML Reconfiguration  |
| Date: 2022-12-14 |
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Abstract

This submission proposes resolutions for multiple comments related to TGbe D2.0 with the following CIDs (24 CIDs):

* 10385, 10436, 10486, 10632, 10722, 10771, 10772, 11102, 11428, 11742, 12163, 12164, 12168, 12169, 12377, 12378, 12481, 12906, 13092, 13277, 12165, 10717, 11658, 13066 (24 CIDs)

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 subsequent 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** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 10385 | 35.3.6.2.1 | 0.00 | The procedure for a non-AP MLD to add a link when the AP MLD adds APs to its set is missing. Without the procedure, the non-AP MLD will be forced to perform the ML-re-setup procedure, which disrupts the ongoing IP traffic. | Add the procedure for a non-AP MLD can add a link without going through a new ML Setup procedure. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10436 | 35.3.6 Multi-Link reconfiguration | 425.38 | Suppose a use case : if a non-AP MLD has set up links with an AP MLD and later AP MLD adds an AP, non-AP needs to have more links for data transmission and wants to add the new link corresponding to the added AP. In current specification, in order to have more setup links the non-AP MLD has to be firstly disassociated with the AP MLD and then (re)setup the links, which would cause the service interruption. Therefore Multi-Link reconfiguration needs to include the addition or deletion of one or more links between a non-AP MLD and AP MLD on the condition that the non-AP MLD has setup more than one link. | The mechanism to add or delete one ore more links between a non-AP MLD and AP MLD on the condition that the non-AP MLD has set up more than one link and is associated with the AP MLD needs to be specified. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10486 | 35.3.6.2.1 | 425.52 | "An AP MLD may add new affiliated APs anytime. A new affiliated APs shall be announced through the Basic Multi-Link element (by changing the Maximum Number Of Simultaneous Links field of the MLD Capabilities and Operations field), and through the Reduced Neighbor Report element (by including a TBTT Information field for the new AP) in the Beacon and Probe Response frames." This requires non-AP STAs to reassociate to use the new link. In order for 802.11be to support Enterprise use cases, it is required to have a mechanism for the AP to add a link without having all the non-AP STAs reassociate. | as in comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10632 | 35.3.6.2.1 | 425.50 | The spec needs to provide guidance on how a non-AP MLD that has performed ML setup with an AP MLD can include an AP, that was recently added as an affiliated AP to the AP MLD, to its existing ML setup | As in comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10722 | 35.3.6.2.1 | 425.53 | need to define a mechnism how does the Non-AP MLD that has already associated with the AP MLD make multilink setup with the new added links. | as in the comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10771 | 35.3.6.2.1 | 425.53 | Since An AP MLD may add new affiliated APs anytime, the capability to add new APs shall be announced in the beacon or probe response so that during the association, the non-AP MLD may allocate certain resources accordingly in advance. Such signaling may improve the link adding process on the non-AP MLD side to avoid reassociation. | Add the signaling in the beacon or probe response that the MLD AP is capable of adding another affiliated AP in the future so that the non-AP MLD can pre-allocate certain resources for the new AP to avoid reassociation. The signaling should contain the number of the AP to be added and optional new AP information. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10772 | 35.3.6.2.1 | 425.53 | If AP MLD is capable of adding new AP in the future, on the client side, it is helpful to know if the non-AP MLD is also capable of setting up new links when AP MLD adds a new link. It may prevent non-AP MLD's reassociation process. | Add signaling of non-AP MLD is capable of adding new link, including the number of links capable of being added. This is different from "the Maximum Number Of Simultaneous Links field". For example, an MLSR device sets up "the Maximum Number Of Simultaneous Links field=0 ", but it is capable of adding a new link while AP MLD adds a link. The Maximum Number Of Simultaneous Links field remains the same after link's addtition, but the proposed signaling should minus 1 | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 11102 | 35.3.6.2.1 | 425.53 | AP add is unnecessarily disruptive. After an AP is removed then re-added from an AP MLD, a non-AP STA must (re)assoc (losing its BA and TWT agreements on the surviving links) to add the new AP to its MLD setup. | At assoc time, allow a new capability bit that allows a non-AP MLD to indicate if the non-AP MLD wants to auto add any newly added affiliated APs to its setup (and start in power save mode in that new link). | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 11428 | 35.3.6.2.1 | 425.56 | The text that allows non-AP MLD to add the newly added AP to its existing ML setup with the AP MLD is missing. | Please add rules for how a non-AP MLD can add the newly added AP to its existing ML setup with the AP MLD without requiring reassociation. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 11742 | 35.3.6.2.1 | 425.56 | On adding an AP to the existing AP MLD all the following processes happen: the BA agreement gets extended to that link, non-default TID-to-Link mapping may take place, a new GTK corresponding to the new link is conveyed to the non-AP MLD. Add normative text for all these cases. | as in comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12163 | 35.3.6.1 | 425.44 | Multi-Link reconfiguration only considers link adding of AP side. There is a case that non-AP side wants to add a link after detecting that AP side is adding a link. Link adding of non-AP side should also be considered. | Add link adding procedure of Non-AP side in 35.3.6 Multi-Link reconfiguration. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12164 | 35.3.6.1 | 425.44 | Multi-Link reconfiguration only considers link removing of AP side. There is a case that non-AP side wants to remove part of links according to the non-AP conditions such as communication quality becoming poor for a particular link, remaining battery capacity becoming low and so on. Link removing of non-AP side should also be considered. | Add link removing procedure of Non-AP side in 35.3.6 Multi-Link reconfiguration. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12168 | 35.3.6 | 427.04 | When an AP add new affiliated APs,it is not clear that non-AP STA MLD may use reassociation request. | Add a subclause for adding links. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12169 | 35.3.6 | 427.04 | It is not clear that non-AP STA MLD may use reassociation request for moving links from current link set. | Add a subclause for removing links. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12377 | 35.3.6.2.1 | 425.53 | Once an associated AP MLD adds new affiliated APs, it is natural that some of its associated non-AP MLDs would also setup new links with the newly added APs; the addition of the new links should be made possible without having to tear down the existing ML Setup. | Expand the ML reconfiguration procedure to also allow non-AP MLDs to add new links to its existing ML setup (i.e., without having to tear down the existing ML Setup and re-performing a new ML Setup including the links with the newly added APs). | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12378 | 35.3.6.2.2 | 426.03 | Similar to the removal of affiliated APs by an AP MLD, a non-AP MLD should also be able to remove its one or more affiliated non-APs without having to tear down the existing ML Setup. One reason for it (e.g., compared to disabling a link through TID-link-mapping, or PS mechanisms) could be simpler link management etc. | Expand the ML reconfiguration procedure to also allow non-AP MLDs to remove affiliated non-AP STAs (i.e., without having to tear down the existing ML Setup and re-performing a new ML Setup excluding the links). | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12481 | 35.3.6.2.1 | 425.50 | The procedure for a non AP MLD already associated to an AP MLD to use a newly added AP is not defined | Please define the procedure for a non-AP STA to associate to a newly added AP when the non-AP MLD is already associated to the AP MLD using existing links. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12906 | 35.3.6 | 425.38 | Since affiliated APs can be added and removed, it is possible for an associated client to detect new affiliated APs in its associated AP MLD that the client is capable of, and intends to take advnatge of. A simple signaling such as a protected action frame exchange can add a new link to the client MLD, without having to disassociate and reassociate fron the AP MLD. This is not a matter of speed or efficiency alone, but seamless addition of adding new resources to existing ones. There is no guarantee for the client to have access to the airtime (TWTs), channels (links) and other resources (e.g., Block Ack window size) it had before disassociation. Simple, disassociating and re-associating is not an option as there is no guarantee to get the same links back. Adding links, by any logic is a post association operation. Another common sense case is when client is denied a link during association (no affilated AP added/removed) -- client must be able to simply try adding a link at a later time without disrupting and risking losing established resources through reassociation. | Add a mechanism to add a link to an existing association | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 13092 | 35.3.6 | 425.38 | Since affiliated APs can be added and removed, it is possible for an associated client to detect new affiliated APs in its associated AP MLD that the client is capable of, and intends to take advnatge of. A simple signaling such as a protected action frame exchange can add a new link to the client MLD, without having to disassociate and reassociate fron the AP MLD. This is not a matter of speed or efficiency alone, but seamless addition of adding new resources to existing ones. There is no guarantee for the client to have access to the airtime (TWTs), channels (links) and other resources (e.g., Block Ack window size) it had before disassociation. Simple, disassociating and re-associating is not an option as there is no guarantee to get the same links back. Adding links, by any logic is a post association operation. Another common sense case is when client is denied a link during association (no affilated AP added/removed) -- client must be able to simply try adding a link at a later time without disrupting and risking losing established resources through reassociation. | Add a mechanism to add a link to an existing association | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 13277 | 35.3.6.2.1 | 425.57 | This clause is missing behavior for the non-AP STA/MLD when a new affiliated AP is added. Add text describing non-AP STA/MLD behavior. | As in comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 12165 | 35.3.5.2 | 423.43 | There is a case that non-AP side wants to add a link after detecting that AP side is adding a link. Link adding of non-AP side should also be considered. There is no description how GTK/IGTK/BIGTK is delivered when a link is added by non-AP side. If they are delivered through 4-way handshake, it requires disassociation and starting from association again which leads to disconnection of the already setup links. | Add a description how GTK/IGTK/BIGTK is delivered when a link is added by non-AP side. | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 10717 | 35.3.6.2.1 | 425.52 | should the TIDs be mapped to the added links, please clarify | as in the comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 11658 | 35.3.6.2.1 | 425.53 | What is the behavior after adding a new affiliated AP? Is the link enable (all TID to link mapping) or link is disabled? Please define the TID-to-link mapping of the new link, and also the power state of the STA affiliated with non-AP MLD after adding new affiliated AP. | as in comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |
| 13066 | 35.3.6.2.1 | 425.53 | What is the behavior after adding a new affiliated AP? Is the link enable (all TID to link mapping) or link is disabled? Please define the TID-to-link mapping of the new link, and also the power state of the STA affiliated with non-AP MLD after adding new affiliated AP. | as in comment | Rejected- This CID is discussed on November 11, 2022 with 22/1709r2, but no straw poll is conducted yet.This CID is discussed on November 17, 2022 with 22/1709r5. The straw poll result is 50 Yes, 47 No, 18Abstain. Binita Gupta 22/1709r5Technical Notes <Main concern mentioned by members was that it is late to address in TGbe> |