IEEE P802.11  
Wireless LANs

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| 11be D2.0 CR for 35.3.5.1 Part I | | | | |
| Date: 2022-07-10 | | | | |
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Abstract

This submission proposes resolutions for the following CIDs:

10002, 10414, 11418, 13270, 10018, 11731, 13268, 13324, 13507, 11561,

13786, 13983, 10084, 10106, 10232, 11417, 11563, 10314, 10315, 14022,

11737, 10316, 12616, 11419, 14061, 13269, 11733, 13271, 11732, 10485,

10728, 11420, 11734, 11947, 13897, 13898, 13896, 11562, 12995, 13520,

11181, 14021, 11735, 11180, 10626, 11178

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revision based on the comments from Abhi
* Rev 2: Revision based on the discussion during the teleconference

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 D2.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe D2.0 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** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 10002 | Robert Sosack | 35.3.5.1 | 421.57 | Unnecessary use of "in" after the word parameter in this line "Basic HT-MCS Set field of the HT Operation parameter in of the AP affiliated" | Remove the word "in" between parameter and of. | Accepted - |
| 10414 | yan li | 35.3.5.1 | 421.57 | support all of the MCSs in the Basic HT-MCS Set field of the HT Operation parameter in of the AP affiliated with the AP MLD' The word 'in' should be removed | as the comment | Accepted - |
| 11418 | Gaurang Naik | 35.3.5.1 | 421.57 | Error in the statement: 'of the HT Operation parameter in of the AP ...' | Revise to 'of the HT Operation parameter of the AP ...'. That is, delete 'in'. | Accepted - |
| 13270 | Binita Gupta | 35.3.5.1 | 421.57 | Remove 'in' from "...Basic HT-MCS Set field of the HT Operation parameter in of the AP affiliated with..." | As in comment | Accepted - |
| 10018 | Morteza Mehrnoush | 35.3.5.1 | 421.06 | Typo in the title of the reference for 11.3. Please fix it as "11.3 (Authentication and association)". | as in comment | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 11731 | Gaurav Patwardhan | 35.3.5.1 | 421.07 | "STA Authentication" has been removed from the 11.3 subclause title. Rename the hyperlink to reflect the same. Similar case for hyperlink of sublcause 11.3 throughout D2.0 | as in comment | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 13268 | Binita Gupta | 35.3.5.1 | 421.07 | Reference to clause 11.3 has a wrong title here and other places. It should be "STA authentication and association". Fix the reference title for 11.3 here and at other occurrences and for the clause 11.3 itself. | As in comment | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 13324 | Muhammad Kumail Haider | 35.3.5 | 421.13 | Clause 11.3 is incorrectly referenced as "ï»¿11.3 (STA authenticationAuthentication and association)" several instances in this clause. Should be "ï»¿11.3 (STA authentication and association)" | as in comment | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 13507 | Amelia Andersdotter | 35.3.5.1 | 421.07 | In "11.3 (STA authenticationAuthentication and association)" there is one "authentication" too many, so it can be removed. | As in comment. | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 11561 | Xiaofei Wang | 35.3.5.1 | 421.13 | reference title seems to be wrong | correct the reference title | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 13786 | Yuchen Guo | 35.3.5.1 | 421.13 | typo of authentication | As in the comment | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 13983 | Geonjung Ko | 35.3.5.1 | 421.07 | Authentication is duplicated. | Remove the duplicate. | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 10084 | Xiangxin Gu | 35.3.5.3 | 423.55 | "the MLD and the peer MLD shall follow the MLD disassociation procedure as described in 11.3 (STA authenticationAuthentication and association)." -> "the MLD and the peer MLD shall follow the MLD disassociation procedure as described in 11.3 (STA Authentication and association)." Same to 35.3.5.1 Multi-link (re)setup procedure | as in the comment | Revised –  Title of the hyperlink is done automatically by framemaker. The current title in 11.3 reflects the change with deletion, but it is likely that when framemaker automatically adds the title in other places, it can not reflect the deletion like the following.  *11.3 ~~STA authentication~~Authentication and association*  We provide an instruction to editor to check whether it is possible that the framemaker software can reflect the title with deletion.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10018 |
| 10106 | Jay Yang | 35.3.5 | 425.21 | "DENIED\_LINK\_ON\_WHICH\_THE\_(Re)ASSOCIATION\_FRAME\_IS\_TRANSMITTED\_NOT\_ ACCEPTED" reason code is too long, need some rewordking | as the comments, just say "can accepted link"? | Rejected –  The name of the status code is only description. If the name is clear, then we should not shorten it and make it potentially unclear. |
| 10232 | John Wullert | 35.3.5.1 | 421.27 | It is not clear whether the sentence "The AP MLD may not accept all the links that are requested for (re)setup" intends to say that AP MLD does not have to accept all or that it may accept none. | If the intention is to say that the AP MLD is not required to accept all the frames, this sentence can be deleted, because the following sentence covers that case. If the intention is to say that the AP may accept none of the proposed links, rephrase as "The AP MLD may accept none (i.e., reject all) of the links that are requested for (re)setup." | Revised –  Agree in principle with the commenter. We delete the redundant sentence and expand description to cover all the cases.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10232 |
| 11417 | Gaurang Naik | 35.3.5.1 | 421.27 | The statement 'The AP MLD may not accept all the links that are requested for (re)setup' gives an impression that the AP MLD never accepts all the requested links, which is not the intention. | Revise the statements 'The AP MLD may not accept all the links that are requested for (re)setup. The AP MLD may accept a subset of the links that are requested for (re)setup.' as follows - "The AP MLD may accept all the links that are requested for (re)setup of a subset of the links that are requested for (re)setup." | Revised –  Agree in principle with the commenter. We delete the redundant sentence and expand description to cover all the cases.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10232 |
| 11563 | Xiaofei Wang | 35.3.5.1 | 421.27 | "may not" is ambiguous and should be replaced according to the style guide. | as in comment | Revised –  Agree in principle with the commenter. We delete the redundant sentence and expand description to cover all the cases.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10232 |
| 10314 | Michael Montemurro | 35.3.5.1 | 421.28 | There are redundant sentences here. The second one looks to be worded better. | At cited location, change "The AP MLD may not accept all the links that are requested for (re)setup. The AP MLD may accept a subset of the links that are requested for (re)setup." to " The AP MLD may accept a subset of the links that are requested for (re)setup." | Revised –  Agree in principle with the commenter. We delete the redundant sentence and expand description to cover all the cases.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10232 |
| 10315 | Michael Montemurro | 35.3.5.1 | 422.15 | What does the AP MLD do? What does "consider it a failure" mean? Presumably this means that the AP MLD responds with a Status code of "BLAH". If that is the requirement, then state so. | Commenter is willing to collaborate on a submission with a set of changes. | Revised –  Agree in principle with the commenter. We provide reference to status code setting in 35.3.5.4.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10315 |
| 11737 | Gaurav Patwardhan | 35.3.5.1 | 422.18 | The previous sentence only specifies the condition for the link on which the (Re)Association frame is sent. There are other cases where AP MLD can consider multi-link setup as a failure. Therefore delete the sentence: "Otherwise, the multi-link (re)setup is successful." | as in comment | Revised –  Otherwise condition refers to the case that “If the link on which the (Re)Association Request frame was received is accepted by the AP MLD”, we expand the description to make it clear.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11737 |
| 14022 | kaiying Lu | 35.3.5.1 | 422.18 | Delete "Otherwise,the multi-link (re)setup is successful." The successful multi-link (re)setup has been defined. | As in comment. | Revised –  It is unclear why the commenter thinks a successful multi-link (re)setup has be defined.  We elaborate the otherwise condition to make it clear.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11737 |
| 10316 | Michael Montemurro | 35.3.5.1 | 422.21 | All of the STAs are affiliated with the AP MLD | At cited location, change “All the STAs of the non-AP MLD” to “All the STAs affiliated with the non-AP MLD” | Revised –  We revise as “All the non-AP STAs affiliated with the non-AP MLD”  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10316 |
| 12616 | Arik Klein | 35.3.5.1 | 422.20 | Need to use a unified terminology along the TGbe spec, and replace "of" with "affiliated with" in the following sentence: "All the STAs of the non-AP MLD shall have the same AID as the one assigned to the non-AP MLD during multi-link setup" | Please correct the sentence as follows: "All the STAs \*affiliated with\* the non-AP MLD shall have the same AID as the one assigned to the non-AP MLD during multi-link setup" | Revised –  We revise as “All the non-AP STAs affiliated with the non-AP MLD”  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10316 |
| 11419 | Gaurang Naik | 35.3.5.1 | 422.21 | Replace 'STAs of the non-AP MLD' with 'STAs affiliated with the non-AP MLD'. | As in comment | Revised –  We revise as “All the non-AP STAs affiliated with the non-AP MLD”  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10316 |
| 14061 | Pooya Monajemi | 35.3.5.1 | 421.14 | Sentence grammar does not read well | Change to "if both the (Re)Association Request frame and the Association Response frame carry a Basic Multi-Link element" | Revised –  We use the suggestion with minor revision.    TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 14061 |
| 13269 | Binita Gupta | 35.3.5.1 | 421.14 | fix the tense in the sentence, carried -> carry | As in comment | Revised –  We rewrite the sentence to fix the grammar.    TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 14061 |
| 11733 | Gaurav Patwardhan | 35.3.5.1 | 421.14 | Change "carried" to "carry" | as in comment | Revised –  We rewrite the sentence to fix the grammar.    TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 14061 |
| 13271 | Binita Gupta | 35.3.5.1 | 423.15 | Change Association Request frame -> Association Response frame | As in comment | Accepted - |
| 11732 | Gaurav Patwardhan | 35.3.5.1 | 421.14 | Replace "setup if" with "setup only if" and then delete the subsequent sentence after the period. | as in comment | Revised –  Agree in principle.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11732 |
| 10485 | Eldad Perahia | 35.3.5.1 | 421.15 | "Otherwise, the (Re)Association Request/Response frame exchange is not for a multi-link setup." Put a reference for procedure to use instead. | as in comment | Revised –  We revise with only if in the previous sentence and delete the following sentence.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11732 |
| 10728 | Insun Jang | 35.3.5.1 | 421.19 | "the requested link(s)" may be misleading. It should be non-AP STA not link in terms of the capabilities and operational parameters | As in the comment | Revised –  We resive the sentence to emphasize that the capabilities and parameters are for the non-AP STAs.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10728 |
| 11420 | Gaurang Naik | 35.3.5.1 | 423.03 | Clause 35.3.2 uses the term 'complete profile'. Change 'complete information' to 'complete profile'. Same change on P423L14. | As in comment | Accepted - |
| 11734 | Gaurav Patwardhan | 35.3.5.1 | 421.22 | Replace "the" with "an" | as in comment | Revised –  Agree in principle.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11734 |
| 11947 | Jarkko Kneckt | 35.3.5.1 | 421.06 | The current text of multi-link re-setup is misleading. There is no resetup process, the resetup needs complete authentication and association operations. If the authentication is redone, then the STA is no longer in associated state, so after authentication, the STA should transmit association request, not a Re-association request. | Please clarify the signaling flow in multi-link resetup and show the signalign flow in a figure. If the re-association cannot be transmitted after new authentication, then please change the title and the main message of the clause accordingly. | Rejected –  It is possible to send reassociation request frame to the same associated AP MLD to resetup the link. This is similar to the procedure that a STA send reassociation request frame to the same associated AP to change parameters and capabilities. No authentication is required if this is done. See 11.3. Citiation of baseline texts are provided below.  *If a Reassociation Response frame is received with a status code of SUCCESS, the state variable for the new AP or PCP shall be set to State 4 or to State 3 if dot11RSNAActivated is true and the FT protocol is not used with respect to the new AP or PCP and,* ***unless the old AP or PCP and new AP or PCP are the same****, to State 2 with respect to the old AP or PCP, and the MLME shall issue an MLME-REASSOCIATE.confirm primitive to inform the SME of the successful completion of the reassociation.* |
| 13897 | Ming Gan | 35.3.5.1 | 421.56 | how about 6 GHz band, please complete this case | add an exception for 6 GHz band | Rejected –  In 6 GHz, there is no HT Operation parameter, and the sentence already has the phrase (if present).  *— The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of the MCSs in the Basic HT-MCS Set field of the HT Operation parameter in of the AP affiliated with the AP MLD* ***(if present)*** *corresponding to the link in the MLME-START.request primitive.* |
| 13898 | Ming Gan | 35.3.5.1 | 421.61 | how about 6 GHz band, please complete this case | add an exception for 6 GHz band | Rejected –  In 6 GHz, there is no VHT Operation parameter, and the sentence already has the phrase (if present).  *— The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of the <VHT-MCS, NSS> tuples indicated by the Basic VHT-MCS And NSS Set field of the VHT Operation parameter of the AP affiliated with the AP MLD* ***(if present)*** *corresponding to the link in the MLME-START.request primitive.* |
| 13896 | Ming Gan | 35.3.5.1 | 421.40 | It is not clear, please rephrase this note | rephrase this note | Revised –  We assume the confusion may come from the fact that two descriptions are mixed into one note. We split the note into two notes.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 13896 |
| 11562 | Xiaofei Wang | 35.3.5.1 | 421.11 | What is the difference between "multi-link setup" and "MLD association", the text seems to indicate that they are the same; then maybe consolidate the terms which can avoid confusion. | as in comment | Revised –  We explain the difference below.  MLD association means association between two MLDs to provide proper DS mapping. Multi-link setup procedure is the procedure to determine which requested link is accepted or rejected. ML setup procedure reuses the (re)association request/response exchange, so ML setup procedure achieves this purpose while doing MLD association.  We revise the description to have this clear at the beginning of the clause.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11562 |
| 12995 | Chunyu Hu | 35.3.5.1 | 421.04 | In my understanding, the ML setup procedure is part of the association procedure. However, 35.3.5 can mislead to the impression that it's a separate step. | Add text to explain the relationship of ML setup procedure and association procedure. | Revised –  We explain the difference below.  MLD association means association between two MLDs to provide proper DS mapping. Multi-link setup procedure is the procedure to determine which requested link is accepted or rejected. ML setup procedure reuses the (re)association request/response exchange, so ML setup procedure achieves this purpose while doing MLD association.  We revise the description to have this clear at the beginning of the clause.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11562 |
| 13520 | Mark Hamilton | 35.3.5.1 | 422.36 | Clarification of associations and DS notification during multi-link setup. | Split the first sentence, to end with "affiliate with the AP MLD." Modify the following text into a new sentence, "However, the mapping between the non-AP STA and corresponding affiliated AP is not provided to the DS." Add a sentence to the end of the previous paragraph, "The non-AP MLD and the AP MLD now have an MLD association, and the DS is notified of this mapping between non-AP MLD and AP MLD." | Revised –  Agree in principle with the commenter. We accept the suggestion with minor revision.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 13520 |
| 11181 | Joseph Levy | 35.3.5.1 | 422.37 | There is no need to state the state of affiliated non-AP STAs or affiliated APs as they do not have any state, for MLO only the MLDs have a state. There is only one MAC SAP in a non-AP MLD and it is paired with the MAC SAP of the AP MLD. Affiliated non-AP STAs can not exchange MPDUs with affiliated AP STAs. Group addressed frames do not require affiliation to be received, protected group addressed frame do require a GTK/IGTK to be receive and the GTKs/IGTKs are sent via the secure link established between the MLDs and not between the affiliated non-AP STAs or affiliated APs as these entities do not have an established secure link. Also, association requires the AP or AP MLD to report the location of a STA or non-AP MLD to the DS, that is the purpose of association to establish a network link (SAP to SAP). | Delete the paragraph: "For each setup link, the corresponding non-AP STA affiliated with the non-AP MLD is in the same associated state as the non-AP MLD and is associated with the corresponding AP affiliated with the AP MLD, without providing the corresponding non-AP STA to the corresponding AP mapping to the DS. For each setup link, the functionalities between a non-AP STA and its associated AP are enabled unless the functionalities have been extended to the MLD level and specified otherwise." | Rejected –  Indeed, MLO has state to align with the definition provided in the baseline. The sentence is added so that we can still reuse the sentence defined in the baseline between non-AP STA and AP in each link. |
| 14021 | kaiying Lu | 35.3.5.1 | 421.33 | "A link that is requested by the non-AP MLD for (re)setup in the (Re)Association Request frame and is accepted by the AP MLD in the (Re)Association Response frame is a setup link between the AP MLD and the associated non-AP MLD unless the corresponding AP of the setup link is removed..." How can a non-AP MLD request to setup a link which has been removed by the AP MLD? | Delete the "unless the corresponding AP of the setup link is removed" | Revised –  We revise the sentence to clarify that the sentence is talking about the case when the AP is removed after the (re)association request/response frame exchange.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 14021 |
| 11735 | Gaurav Patwardhan | 35.3.5.1 | 421.36 | There is no need for the subordinate clause starting with "unless". | Remove "unless the corresponding AP ..." | Revised –  We revise the sentence to clarify that the sentence is talking about the case when the AP is removed after the (re)association request/response frame exchange.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 14021 |
| 11180 | Joseph Levy | 35.3.5.1 | 422.31 | This paragraph is verry poorly constructed and is confusing. What does "... the non-AP MLD and the AP MLD set up link(s) for multi-link operation (see 35.3 (Multi-link operation) and the rest of the subclause 35.3 (Multi-link operation)+A20), ..." mean? Also a non-AP MLD is associated with the AP MLD, it is never reassociated as that is the act of renewing/changing an association. | Replace: "After successful multi-link (re)setup between a non-AP MLD and an AP MLD, the non-AP MLD and the AP MLD set up link(s) for multi-link operation (see 35.3 (Multi-link operation) and the rest of the subclause 35.3 (Multi-link operation)), and the non-AP MLD is (re)associated with the AP MLD (i.e., in State 3 or State 4, see 11.3.2 (State variables))." With: ""After successful multi-link (re)setup the non-AP MLD is associated with the AP MLD (i.e., in State 3 or State 4, see 11.3.2 (State variables)) and the link(s) for multi-link operation (see 35.3 (Multi-link operation) are configured." | Revised –  We revise the order of the description in the sentence to make it read better.  We also just use “associated” now.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11180 |
| 10626 | Abhishek Patil | 35.3.5.1 | 421.03 | Define a status code for rejection if an AP MLD receives an assoc request with either the MLD ID or the Link ID that doesn't match its MLD ID or active Link IDs. | As in comment | Revised –  MLD ID is not included in the basic multi-link element included in the (re)association request frame.  *The MLD ID subfield indicates the identifier of the AP MLD that is targeted by the Multi-Link probe request.*  For link ID, we add the status code DENIED\_LINK\_ID\_NOT\_EXIST.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 10626 |
| 11178 | Joseph Levy | 35.3.5.1 | 421.06 | It should be clear that Multi-link (re)setup procedure is simply an extension of (re)association. A non-AP MLD (re)associates with a AP MLD and includes the Basic Multi-Link element in its request, and the AP MLD includes the Basic Multi-Link element in its response. Yes there are new rules about what these Basic Multi-Link elements can/cannot should/should not contain - but the basic procedure is (re)association. Therefore there is no need to specify in this clause that a STA must preform authentication prior to association, as authentication is always preformed prior to association. See 11.3.2 figure 11-21. | Replace: "Before a non-AP MLD performs multi-link (re)setup with an AP MLD, the non-AP MLD and AP MLD shall follow MLD authentication procedure as described in 11.3 (STA authenticationAuthentication and association) For a non-AP MLD to perform multi-link (re)setup with an AP MLD, the non-AP MLD and the AP MLD shall exchange (Re)Association Request/Response frames and shall follow the MLD (re)association procedure as described in 11.3 (STA authenticationAuthentication and association). A (Re)Association Request/Response frame exchange is for a multi-link setup if both the frames carried Basic Multi-Link element. Otherwise, the (Re)Association Request/Response frame exchange is not for a multi-link setup. In the (Re)Association Request frame, the non-AP MLD indicates the link(s) that are requested for (re)setup and the capabilities and operational parameters of the requested link(s) as described in 35.3.5.4 (Usage and rules of Basic Multi-Link element in the context of multi-link (re)setup). The non-AP MLD may request to (re)set up link(s) with a subset of APs affiliated with the AP MLD. In the (Re)Association Response frame, the AP MLD shall indicate the requested link(s) that are accepted and the requested link(s) that are rejected for (re)setup and the capabilities and operational parameters of the requested link(s) as described in 35.3.5.4 (Usage and rules of Basic Multi-Link element in the context of multi-link (re)setup). The AP MLD may not accept all the links that are requested for (re)setup. The AP MLD may accept a subset of the links that are requested for (re)setup. The (Re)Association Response frame shall be sent to the non-AP STA affiliated with the non-AP MLD that sent the (Re)Association Request frame. A link that is requested by the non-AP MLD for (re)setup in the (Re)Association Request frame and is accepted by the AP MLD in the (Re)Association Response frame is a setup link between the AP MLD and the associated non-AP MLD unless the corresponding AP of the setup link is removed as defined in 35.3.6 (Multi-Link reconfiguration)." With: "Multi-link (re)setup procedure uses the STA (re)association procedure described in 11.3, with the addition that the (Re)Association Request and Response frames exchanged include a Basic Multi-Link element. (Re)Association Request and Response frames shall be sent on the same channel and the channel must correspond to one of requested links. A non-AP MLD shall provide the requested capabilities and operations parameters of the requested link(s) in the Basic Multi-Link element in the (Re)Association Request frame. An AP MLD shall indicate the links it will accept and which of the requested links it has rejected as described in 35.3.5.4 (Usage and rules of Basic Multi-Link element in the context of multi-link (re)setup). An AP MLD may accept a subset of the requested links." | Revised –  Agree in principle that we can keep the authentication part as a note.  TGbe editor to make the changes shown in 11-22/1054r2 under all headings that include CID 11178 |

**Discussion: None**

***TGbe editor: Change the reference 11.3 (STA authenticationAuthentication and association) to 11.3 (~~STA authentication~~Authentication and association) throughout D2.0 if possible(#10018)***

***TGbe editor: Change 35.3.5.1 Multi-link (re)setup procedure as follows (track change on):***

**35.3.5 Multi-link (re)setup**

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1. **35.3.5.1 Multi-link (re)setup procedure**

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1. The multi-link (re)setup procedure is completed through the exchange of (Re)Association Request and (Re)Association Response frames and establishes the setup link(s) between a non-AP MLD and an AP MLD. Tnon-AP MLD and ( (#11562)
2. NOTE - Prior to utilizing (Re)Association Request/Response frame exchange to perform multi-link (re)setup with an AP MLD, the non-AP MLD and AP MLD follow the MLD authentication procedure as described in 11.3 (STA authenticationAuthentication and association).(#11178)

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1. (#11562)A (Re)Association Request/Response frame exchange is for a multi-link setup only if(#11732) both the (Re)Association Request frame and the (Re)Association Response frame include a (#14061) Basic Multi-Link element..(#11732)

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In the (Re)Association Request frame, the non-AP MLD indicates the link(s) that are requested for (re)setup

and the capabilities and operational parameters of the non-AP STA(s) affiliated with the non-AP MLD corresponding to the(#10728) requested link(s) as described in [35.3.5.4 (Usage and](#bookmark29) [rules of Basic Multi-Link element in the context of multi-link (re)setup)](#bookmark29). A(#11734) non-AP MLD may request to (re)set up link(s) with a subset of APs affiliated with the AP MLD.

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1. In the (Re)Association Response frame, the AP MLD shall indicate the requested link(s) that are accepted
2. and the requested link(s) that are rejected for (re)setup and the capabilities and operational parameters of the
3. requested link(s) as described in [35.3.5.4 (Usage and rules of Basic Multi-Link element in the context of](#bookmark29)
4. [multi-link (re)setup)](#bookmark29). The AP MLD may do one of the following:

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1. - accept all the links that are requested for (re)setup, or
2. - accept a subset of the links that are requested for (re)setup, or
3. - reject all the links that are requested for (re)setup. (#10232)
4. The (Re)Association Response frame shall be transmitted by the AP MLD through the affiliated AP that receives the (Re)Association Request frame. . (#10232)
5. A link that is requested by the non-AP MLD for (re)setup in the (Re)Association Request frame and is
6. accepted by the AP MLD in the (Re)Association Response frame is a setup link between the AP MLD and

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1. the associated non-AP MLD, unless the corresponding AP of the setup link is removed after the (Re)Association Request/Response frame exchange as defined in [35.3.6](#bookmark30) [(Multi-Link reconfiguration)](#bookmark30).(#14021)

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1. NOTE 1—The links that are requested for resetup are independent of the existing setup links with an associated AP MLD.(#13896)
2. NOTE 2 – The capability and operation parameters of each requested link during multi-link resetup are independent of the capability and operation parameters of each existing setup link with an associated AP MLD. (#13896)
3. NOTE 3(#13896)—The link requested by the non-AP MLD might not exist because the AP MLD has removed the corresponding affiliated AP (see [35.3.6.2.2 (Removing affiliated APs)](#bookmark32)) in which case the AP MLD might reject the requested link or the AP MLD might add the corresponding affiliated AP (see [35.3.6.2.1 (Adding new affiliated APs)](#bookmark31)) and the AP MLD might accept the requested link.

48 The AP MLD shall not accept a link that is requested for (re)setup if any of the following condition is true:

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1. — The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of
2. the rates in the BSSBasicRateSet parameter and all of the membership selectors in the
3. BSSMembershipSelectorSet parameter of the AP affiliated with the AP MLD corresponding to the

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1. link in the MLME-START.request primitive.
2. — The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of
3. the MCSs in the Basic HT-MCS Set field of the HT Operation parameter (#10002)of the AP affiliated with
4. the AP MLD (if present) corresponding to thfe link in the MLME-START.request primitive.

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1. — The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of
2. the <VHT-MCS, NSS> tuples indicated by the Basic VHT-MCS And NSS Set field of the VHT
3. Operation parameter of the AP affiliated with the AP MLD (if present) corresponding to the link in

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63 the MLME-START.request primitive

— The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of

1. the <HE-MCS, NSS> tuples indicated by the Basic HE-MCS And NSS Set field of the HE Operation
2. parameter of the AP affiliated with the AP MLD corresponding to the link in the MLME-
3. START.request primitive.

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1. — The non-AP STA affiliated with the non-AP MLD corresponding to the link does not support all of
2. the <EHT-MCS, NSS> tuples indicated by the Basic EHT-MCS And NSS Set field of the EHT
3. Operation parameter of the AP affiliated with the AP MLD corresponding to the link in the MLME-

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10 START.request primitive.

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1. An MLD that requests or accepts multi-link (re)setup for any two links ensures that each link is located on
2. different nonoverlapping channels.
3. If the link on which the (Re)Association Request frame was received cannot be accepted by the AP MLD,
4. the AP MLD shall treat the multi-link (re)setup as a failure and shall not accept any requested links. If the link on which the (Re)Association Request frame was received is accepted by the AP MLD (#11737), the multi-link (re)setup is successful.
5. NOTE 5 - See 35.3.5.4 (Usage and rules of Basic Multi-Link element in the context of multi-link (re)setup) for the setting of the Status Code field.(#10315).
6. An AP MLD shall assign a single AID to a non-AP MLD upon successful multi-link setup. All the non-AP STAs affiliated with the non-AP MLD shall have the same AID as the one assigned to the non-AP MLD during multi-link setup.(#10316)

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1. NOTE 4(#13896)— In a multiple BSSID set, the first 2n bits of the partial virtual bitmap of TIM element are reserved for the indication of group addressed frame for the BSSIDs in the set (see 11.1.3.8.5 (Traffic advertisement in a multiple BSSID set)). As a result, an AP affiliated with an AP MLD does not assign, to a non-AP MLD, an AID value that is less than 2N where N is the maximum of the value carried in the MaxBSSID Indicator (n) field of the Multiple BSSID element corresponding to each link that is accepted as part of the multi-link (re)setup where the AP affiliated with the AP MLD belongs to a multiple BSSID set.

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1. After successful multi-link (re)setup between a non-AP MLD and an AP MLD, the non-AP MLD is associated with the AP MLD following the MLD (re)association procedure as described in 11.3 (i.e., in State 3 or State 4, see 11.3.2 (State variables)), and thenon-AP MLD and the AP MLD set up link(s) for multi-link operation (see [35.3 (Multi-link operation))](#bookmark9) .(#11180)

For each setup link, the corresponding non-AP STA affiliated with the non-AP MLD is in the same associated state as the non-AP MLD and is associated with the corresponding AP affiliated with the AP MLD. For each setup link, there is no mapping between the non-AP STA affiliated with the non-AP MLD and the AP affiliated with the AP MLD provided to the DS. (#13520)

NOTE 6 - The non-AP MLD and the AP MLD have an MLD association (see 11.3), and the DS is notified of this mapping between the non-AP MLD and the AP MLD (see 4.5.3.3 (Association)).(#13520)

For each setup link, the functionalities between a non-AP STA affiliated with the non-AP MLD and its associated AP affiliated with the AP MLD are enabled unless the functionalities have been extended to the MLD level and specified otherwise. (#13520)

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44 An example of multi-link setup is shown in [Figure 35-10 (Example of multi-link setup)](#bookmark28).

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MLD

Association Request frame

Association Response frame

MLD

2.4

GHz WM

Non-AP STA 3

Non-AP STA 2

Non-AP STA 1

AP 3

6 GHz

AP 2

5 GHz

AP 1

2.4 GHz

AP 3

6 GHz

AP 2

5 GHz

AP 1

2.4 GHz

47

AP

48

49

50

51

52

53

54

Non-AP

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AP MLD

Successful multi-link setup

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GHz WM

6

GHz WM

Link 1

2.4

GHz WM

Link 2

5

GHz WM

Link 3

6

GHz WM

Non-AP MLD

Non-AP STA 3

Non-AP STA 2

Non-AP STA 1

**Figure 35-10—Example of multi-link setup**

1. In this example, the AP MLD has three affiliated APs: AP 1 operates in the 2.4 GHz band, AP 2 operates in
2. the 5 GHz band, and AP 3 operates in the 6 GHz band. Non-AP MLD initiates the multi-link setup
3. procedure and non-AP STA 1 affiliated with the non-AP MLD sends an Association Request frame to AP 1
4. affiliated with the AP MLD, i.e., the TA field of the Association Request frame is set to the MAC address of

the non-AP STA 1 and the RA field of the Association Request frame is set to the MAC address of the AP 1.

1. The Association Request frame includes a Basic Multi-Link element that indicates the MLD MAC address

of the non-AP MLD and complete profile(#11420) of non-AP STA 1 (in the frame body of the Association Request frame), non-AP STA 2 (in a Per-STA Profile subelement carried in the Basic Multi-Link element), and non-AP STA 3 (in a Per-STA Profile subelement carried in the Basic Multi-Link element) to request three links to be setup (one link between AP 1 and non-AP STA 1, one link between AP 2 and non-AP STA 2, and one link between AP 3 and non-AP STA 3). AP MLD then responds to the requested multi-link setup, and AP 1 affiliated with the AP MLD sends an Association Response frame to non-AP STA 1 affiliated with the non-AP MLD, i.e., the TA field of the Association Response frame is set to the MAC address of the AP 1 and the RA field of the Association Response frame is set to the MAC address of the non-AP STA 1, to indicate successful multi-link setup. The Association Response frame includes a Basic Multi-Link element that indicates the MLD MAC address of the AP MLD and complete profile(#11420) of AP 1 (in the frame body of the Association Response(#13271) frame), AP 2 (in a Per-STA Profile subelement carried in the Basic Multi-Link element), and AP 3 (in a Per-STA Profile subelement carried in the Basic Multi-Link element). After successful multi-link setup between the non-AP MLD and AP MLD, three links are setup (link 1 between AP 1 and non-AP STA 1, link 2 between AP 2 and non-AP STA 2, and link 3 between AP 3 and non-AP STA 3).

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**9.4.1.9 Status Code field**

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1. ***Change the Status Code 18 and insert the following news rows (130 to 135) to*** [***Table 9-78***](#bookmark80)[***(Status codes)***](#bookmark80) ***while maintaining the numerical order and updating the reserved range:***

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9 **Table 9-78—Status codes**

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| --- | --- | --- |
| **Status code** | **Name** | **Meaning** |
| … | … | … |
| 18 | REFUSED\_BASIC\_RATES\_MIS- MATCH | Association denied due to requesting STA not supporting all of the data rates in the BSSBasicRateSet parameter, the Basic HT-MCS Set field of the HT Operation param- eter, the Basic VHT-MCS And NSS Set field in the VHT Operation parameter, ~~or~~ the Basic HE-MCS And NSS Set field in the HE Operation parameter, or the Basic EHT-MCS And NSS Set field in the EHT Operation parameter. |
| … | … | … |
| 130 | DENIED\_STA\_AFFILIAT- ED\_WITH\_MLD\_WITH\_EXIST- ING\_MLD\_ASSOCIATION | Association denied because the requesting STA is affili- ated with a non-AP MLD that is associated with the AP MLD. |
| 131 | EPCS\_DENIED\_UNAUTHORIZED | EPCS priority access denied because the non-AP MLD is not authorized to use the service. |
| 132 | EPCS\_DENIED\_OTHER\_REASON | EPCS priority access denied due to reason outside the scope of this standard. |
| 133 | DENIED\_TID\_TO\_LINK\_MAPPING | Request denied because the requested TID-to-link map- ping is unacceptable. |
| 134 | PREFERRED\_TID\_TO\_LINK\_MAP- PING\_SUGGESTED | Preferred TID-to-link mapping suggested. |
| 135 | DENIED\_EHT\_NOT\_SUPPORTED | Association denied because the requesting STA does not support EHT features. |
| <ANA> | DENIED\_LINK\_ON\_WHICH\_THE\_ (RE)ASSOCIATION FRAME\_IS\_ TRANSMITTED\_NOT\_ACCEPTED | Link not accepted because the link on which the (Re)Association Request frame is transmitted is not accepted. |
| <ANA> | DENIED\_LINK\_ID\_NOT\_EXIST | Link not accepted because the indicated link ID does not exist.(#10626) |

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