IEEE P802.11  
Wireless LANs

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| 11be D2.0 CR for 35.3.14 | | | | |
| Date: 2022-09-12 | | | | |
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| Po-Kai Huang | Intel |  |  |  |

Abstract

This submission proposes resolutions for the following CIDs:

12381, 12382, 12383, 10319, 10651, 10320, 10321, 10322, 10323, 10652,

10653, 11749, 11750, 11751, 12645, 12646, 12649, 12650, 13383, 13384,

13385, 14046, 10324, 11134, 11570, 12324, 12384, 14047, 14048, 10655,

13386, 12487, 12815, 10286, 11526, 13994, 11968, 12647, 12648,

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Editorial revision on the resolution explanation
* Rev 2: Revision based on the discussion in the teleconference call
* Rev 3: Revision for CID 14046 and CID 14047 marked with green. Add CID 12647 and CID 12648.
* Rev 4: Revision based on the discussion during the teleconference
* Rev 5: Revision for CID 13386 and add CID 12487

14046, 14047,

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.***

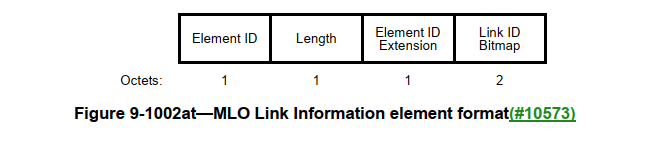
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 12381 | Rojan Chitrakar | 35.3.14 | 448.50 | While I believe the intention of this paragraph is to describe the cross link transmission of MMDPUs, the sentence is very hard to read and not very clear on the intention. Especially the phrase "..with a setup link.." seems redundant and could be deleted without changing the meaning of the sentence; "associated MLD" already means that the links are setup. | Rephrase the sentence to better capture the intended usage (cross-link transmission). Consider deleting the phrase "with a setup link." when used in the context of "..associated MLD with a setup link." throughout 35.3.14. | Rejected –  For an associated AP MLD, there may be affiliated AP without setup link (ex band not support). Sending a frame intended to an AP without setup link does not make sense. As a result, the description is required to be technically accurae. |
| 12382 | Rojan Chitrakar | 35.3.14 | 449.04 | It is not clear why the MIB (dot11EHTBaseLineFeaturesImplementedOnly) is referenced in this sentence but not in the preceding ones (P448L50). Also the sentence could be made rephrased to better capture the intended usage. | Rephrase the sentence to better capture the intended usage (that cross-link transmission is not allowed?). Either delete the reference to the MIB here, or add it in the preceding sentence as well. | Rejected –  The previous sentence is about the basic ones that EHT can support. The next sentence is related to the other cases that we may extend when dot11EHTBaseLineFeaturesImplementedOnly = false. |
| 12383 | Rojan Chitrakar | 35.3.14 | 449.48 | It appears that if the reference to class 3 is deleted, this sentence captures what the previous two paragraphs are separately describing; also it is not clear why the previous two paragraphs only mentions a subset of the frames that are intended for MLD (e.g., why BA Action frames are not included) etc. | Consider making this sentence more generic (e.g., deleting the reference to class 3) so as to capture the previous two paragraphs as well and delete the previous two paragraphs. Assigning names to the frames (e.g., MLD level MMPDU, link level MMPDU etc.) could also help to simplify this clause. | Rejected -  Note that the previous paragraphs has sentences refers to non-AP MLD on authentication, (re)association request, multi-link probe request and note that for AP to respond, the following exchange sequence will have to be in the same link. This is the reason why the sentence is written separately for non-class 3 frames. We also note that for class 3 frames, we write to associated MLD with setup link to clarify that this is only possible after association.  *A non-AP MLD may transmit an individually addressed MMPDU that is an Authentication frame that includes a Basic Multi-Link element or a (Re)Association Request frame that includes a Basic Multi-Link element or a Multi-Link probe request* |
| 10319 | Michael Montemurro | 35.3.14.1 | 447.62 | his is a bizarre sentence to begin the clause "The following individually addressed Management frames are excluded from the rules defined in this subclause. ". Change to "This clause describes requirements for frame delivery of individually addressed management frames by a multilink device, with the exception of the following frames:" | At cited location, change "The following individually addressed Management frames are excluded from the rules defined in this subclause. "  to "This clause describes requirements for frame delivery of individually addressed management frames by a multilink device, with the exception of the following frames:" | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10319 |
| 10651 | Abhishek Patil | 35.3.14.1 | 448.49 | Sentence is long and confusing. Furthermore, the reference to clause 35.3.7 is not clear. If a link is disabled or in power-save, the correspond STA will not transmit a frame. Therefore, simplify as: "Between an AP MLD and a non-AP MLD that have performed ML setup, a STA affiliated with either MLD may transmit an individually addressed MMPDU that is intended for one or more STA(s) affiliated with other MLD, where the intended STA(s) is operating on a link that is part of ML setup if the MMPDU satisfies all the following conditions:" | As in comment | Revised –  We simply move the reference to the beginning.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10651 |
| 10320 | Michael Montemurro | 35.3.14.1 | 448.49 | No idea what this paragraph is trying to say. Consider re-wording | Commenter is willing to collaborate on a submission with a set of changes. | Revised –  We use “, which …,” to separate a certain part of description to improve readibilty.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10320 |
| 10321 | Michael Montemurro | 35.3.14.1 | 448.58 | Shouldn't the frames in this first bullet (and the third bullet for that matter not be repeated here). Consider of maintaining only one location where exceptions are called out. | Commenter is willing to collaborate on a submission with a set of changes. | Revised –  It is indeed true that we do not need to repeat every frame list at the beginning. We list out just because some frames like FTM or LMR are excluded by bufferable condition. However, we can simplify it. For the first bullet, it is the first time that we specify this in this subclause, and it also includes response frame.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10321 |
| 10322 | Michael Montemurro | 35.3.14.1 | 449.04 | The cited paragraph is impossible to follow. Please re-word | Commenter is willing to collaborate on a submission with a set of changes. | Revised –  We use “, which …,” to separate a certain part of description to improve readibilty.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10322 |
| 10323 | Michael Montemurro | 35.3.14.1 | 449.16 | The list of frames at the cited location look to be incomplete. Would this not be simply Auth, Assoc, Deauth, Disassoc, and buffereable BUs? | Commenter is willing to collaborate on a submission with a set of changes. | Rejected –  We note that not every buffereable BUs are intended for MLD. |
| 10652 | Abhishek Patil | 35.3.14.1 | 448.57 | Is line 57 supposed to be a separate bullet just like others? | As in comment | Revised-  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10652 |
| 10653 | Abhishek Patil | 35.3.14.1 | 448.57 | Why is Extended Channel Switch Announcement frame listed here? It is not an individually addressed frame per baseline spec (see REVme D1.2 P2809L61). | As in comment | Revised –  The commenter refers to the following baseline texts. Agree to delete the reference.  *The Address 1 field of an Extended Channel Switch Announcement frame shall be set to the broadcast address.*  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10653 |
| 11749 | Gaurav Patwardhan | 35.3.14.1 | 449.10 | Replace "intended for a STA" with "intended for a STA affiliated with an MLD" | as in comment | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 11749 |
| 11750 | Gaurav Patwardhan | 35.3.14.1 | 449.35 | Add a bullet for "BSS Transition Management Request/Response frames" to the list of frames to be processed at the MLD level. | as in comment | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 11750 |
| 11751 | Gaurav Patwardhan | 35.3.14.1 | 449.50 | Add reference for (see 35.3.14.2 (Identification of Intended STA)). | as in comment | Rejected –  The referered sentence talks about management frame intended for MLD and does not need the indication in 35.3.14.2.  *An MLD may transmit an individually addressed MMPDU that is a Class 3 frame that is intended for an associated MLD through any STA affiliated with the associated MLD with a setup link subject to additional constraints (see 35.3.7 (Link management)).* |
| 12645 | Arik Klein | 35.3.14.1 | 448.42 | The sentence should be revised to clarify the scenario where the individually addressed management frame exchange on one link can't start till a previous individually addressed management frame exchange on another link of the same MLD has been completed (successfully or unsuccessfully). Please revise as proposed. | Please revise the sentence as follows: "A STA affiliated with the MLD with dot11QMFActivated equal to false shall not transmit other individually addressed Management frames (except the frames that are excluded above) to \*its peer\* STA affiliated with the associated MLD while the current individually addressed Management frame (except the frames that are excluded above) \*being transmitted by another STA affiliated with the same MLD \* has not yet completed to the point of success, failed due to retry limit, or other MAC discard "(e.g., lifetime expiration). | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 12645 |
| 12646 | Arik Klein | 35.3.14.1 | 448.50 | The "intended STA" concept which corresponds to MMPDU frame exchange between MLDs seems not to coincide with figure 5-a and figure 5-b and their corresponding architecture description in 5.1.5: The MMPDU (similarly to the MSDU) is exchanged among the AP MLD and the non-AP MLD. Therefore the intended recipient of the MMPDU can be either AP MLD or non-AP MLD and not the affiliated AP / non-AP STA. The way that the MMPDU are exchanged on the air can be on each of the setup link among the MLDs, using the corresponding affiliated AP / non-AP STA. Thus, the scenario described in the following sentence " an MLD may transmit an individually addressed MMPDU that is intended for one or more STA(s) affiliated with the associated MLD with setup link(s) to another STA (other than the intended STA(s)) affiliated with the associated MLD with a setup link subject to additional constraints (see 35.3.7 (Link management))" seems to be incorrect. | Please rephrase the sentence with the correct scenario in a way that it will coincide with 5.1.5 | Revised –  After discussing with the commenter, we add “through affiliated STA” for transmission across the clause rather than just using “MLD transmits”. We also remove “or more” from “intended for one or more” because dot11EHTBaseLineFtauresImplemented is removed to mandate bitmap always have one bit to be 1.  TGbe editor to make the changes shown in 11-22/1583r4 under all headings that include CID 12646 |
| 12649 | Arik Klein | 35.3.14.1 | 449.10 | According to REVme D1.0, the intended STA to which an individually addressed MMPDU is destined is simply defined by the RA field (Address 1) in the frame header. Therefore the distinction regarding an individually addressed MMPDU which is intended for a STA or MLD is not clear, since the frame will be transmitted only by the affiliated non-AP STA/ AP to the corresponding affiliated AP / non-AP STA of the associated MLD, even if the MMPDU is destined for the peer MLD. Please clarify the sentence or remove it. | As in comment. | Revised –  After discussing with the commenter, we add “through affiliated STA” for transmission across the clause rather than just using “MLD transmits”. We also remove “or more” from “intended for one or more” because dot11EHTBaseLineFtauresImplemented is removed to mandate bitmap always have one bit to be 1.  We also clarify that the sentence has “to another STA”, which already clarifies that RA is not the intended ones.  TGbe editor to make the changes shown in 11-22/1583r4 under all headings that include CID 12646 |
| 12650 | Arik Klein | 35.3.14.1 | 449.15 | The purpose of the entire list of MMPDUs that "shall be intended for an MLD" is not clear: 1. In case of MLD, the MMPDUs (As well as the MSDUs, A-MSDUs) are always exchanged among MLDs. 2. The MMPDUs are carried in Management frames that are transmitted through one or more setup links between the MLDs, using the affiliated non-AP STA/ AP. 3. The indication of the "intended recipient" of the frame is done through the Address 1 field of the Frame Header, so it will always refer to affiliated AP / non-AP STA, even if the final destination is the MLD | Please clarify the term "intended for MLD" and how it is indicated in the exchanged frame consider using "applied for MLD" -seems better terminology than "intended for MLD" (less confusing) | Revised –  After discussing with the commenter, we add “through affiliated STA” for transmission across the clause rather than just using “MLD transmits”. We also remove “or more” from “intended for one or more” because dot11EHTBaseLineFtauresImplemented is removed to mandate bitmap always have one bit to be 1.  TGbe editor to make the changes shown in 11-22/1583r3 under all headings that include CID 12646 |
| 13383 | Liwen Chu | 35.3.14.1 | 447.62 | Probe Request should be included in the list | update the text according to the comment. | Revised –  The commenter’s concern is that Probe Request that is not ML Probe request should not be sent cross link. This has already be clarified in the rule that we only limit class 3 frame to be able to do cross link.  TGbe editor to make the changes shown in 11-22/1583r4 under all headings that include CID 10319 |
| 13384 | Liwen Chu | 35.3.14.1 | 448.08 | Clarify that Probe Request is not ML Probe Request | update the text according to the comment. | Revised –  The commenter means Probe Response frame. We note that ML Probe Response frame is classified as MLD in the following description and is not excluded for classification.  TGbe editor to make the changes shown in 11-22/1583r4 under all headings that include CID 10319 |
| 13385 | Liwen Chu | 35.3.14.1 | 448.49 | It is not resonable that the ML Probe Request/Response can only be transmitted in one link between AP MLD and associated non-AP MLD | update the text according to the comment. | Rejected –  Multi-link probe request/response is classified as intended for MLD and can be transmitted on any link. |
| 14046 | kaiying Lu | 35.3.14.1 | 449.07 | Change "with setup link(s)" to "with enabled link(s)". | As in comment. | Revised –  Agree in principle with the commenter. Sending management frame intended for a disabled link over other links does not make sense because over the disabled link, all the management frames that can be sent cross link are disallowed anyway.  TGbe editor to make the changes shown in 11-22/1583r3 under all headings that include CID 14046 |
| 10324 | Michael Montemurro | 35.3.14.2 | 449.59 | This requirement is buried here and does not align with Clause 9 frame definitions. Ensure that clause 9 frame definitions include this element definition. Alternatively, the A3 field of the MMPDU can be set to the BSSID of the intended link. | Commenter is willing to collaborate on a submission with a set of changes. | Revised –  We add MLO link information frame to Framebody of action frame.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10324 |
| 11134 | Brian Hart | 35.3.14.2 | 450.22 | I cannot parse "then the MLD shall discard the MMPDU if the MLO Link Informationindicates any link without being setup." | Instead of "without being setup" does it mean "that has not been setup" or "that is not part of the current link setup" or similar? | Revised –  Agree in principle with the commenter. This has been resolved by CID 13332 in 1430r1 and “without being setup” changed to “that is not a setup link”.  TGbe editor to make the changes shown in 11-22/1430r1 under all headings that include CID 13332 |
| 11570 | Xiaofei Wang | 35.3.14.2 | 450.22 | without being setup is not grammatically correct; suggest to change to "that is not setup". | as in comment | Revised –  Agree in principle with the commenter. This has been resolved by CID 13332 in 1430r1 and “without being setup” changed to “that is not a setup link”.  TGbe editor to make the changes shown in 11-22/1430r1 under all headings that include CID 13332 |
| 12324 | Guogang Huang | 35.3.14.2 | 450.05 | For the individually addressed MMPDU which can be transmitted through any enabled link, the MLO Link Informationelement shall be included. Otherwise, it will complicate the AP's scheduling and increase the packet delay. | As in comment | Rejected –  AP can always include the MLO Link Informationelement if the AP wants. The spec does not prevent this implementation. |
| 12384 | Rojan Chitrakar | 35.3.14.2 | 450.05 | The NOTE should also explain why the retransmission is not possible. | As in the comment. | Rejected –  The frame does not include MLO Link Informationduring retransmission, which conflicts the requirement that Multi-link link information needs to be included. |
| 14047 | kaiying Lu | 35.3.14.2 | 449.58 | Change "with setup link(s)" to "with enabled link(s)". | As in comment. | Revised –  Agree in principle with the commenter. Sending management frame intended for a disabled link over other links does not make sense because over the disabled link, all the management frames that can be sent cross link are disallowed anyway.  TGbe editor to make the changes shown in 11-22/1583r3 under all headings that include CID 14046 |
| 14048 | kaiying Lu | 35.3.14.2 | 450.22 | The MLD shall discard the MMPDU if the MLO Link Informationindicates any link without being setup or without being enabled. Add "without being enabled" as suggested. | As in comment. | Rejected –  Disabled link still maintains state and may have state update. |
| 10655 | Abhishek Patil | 35.3.13.2 | 450.22 | The phrase "without being setup" is incorrect. Replace as "that is not part of the multi-link setup between the two MLDs" | As in comment | Revised –  We simple revise as “that is not a setup link”  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 10655 |
| 13386 | Liwen Chu | 35.3.14.1 | 447.59 | TWT Information frame can be transmitted rhough cross link and take effect rightaway. However it is difficul to be implemented. The TWT Information frame should be defined as one of the following: 1, TWT Information for one link can't be transmitted in another link, 2, the TWT Information frame for one link can be transmitted in another link. However the TWT Information frame transmitted through cross link will take effect in the following TXOP.  . | update the text according to the comment. | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r5 under all headings that include CID 13386 |
| 12487 | Jeongki Kim | 35.3.14.1 | 448.50 | In Tgbe D2.0, a management frame can carry multi-link ID for indicating a link a content in the management frame is applied for. That is, a management frame for a link can be sent on another link. TWT Information frame sent on a link can be a good candidate for indicating TWT suspension/resumption/flexible TWT on another link. For example, flexible TWT considering multi-link can reduce a latency of a latency sensitive traffic. Need to describe texts related to ML TWT Information operation. | Describe texts related to TWT suspension/resumption/flexible TWT procedures considering multiple link. | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r5 under all headings that include CID 13386 |
| 12815 | Laurent Cariou | 35.3.14.1 | 449.04 | As currently written, a first MLD may use the cross-link management frame mechanism to transmit a management frame intended for one STA of a second MLD to another STA of the same second MLD. Also, all frame have to be able to be sent on all links as all frames can be retrieved by a non-AP MLD on any of the enabled links. The sentence starting with otherwise should then be more restrictive: other frames shall not be transmitted at all, or they shall not be buffered. |  | Revised –  We note that in 35.3.12.4, any MPDU may be buffered when all non-AP STAs affiliated with the non-AP MLD are in power save mode. However, when a frame is retrieved due to Ps-Poll or U-APSD, if the frame does not have link information and has to be transmitted to a different link, then the frame is likely to be discarded. We add a note to clarify this.  TGbe editor to make the changes shown in 11-22/1583r4 under all headings that include CID 12815 |
| 10286 | Michael Montemurro | 61 | 119.60 | So what happens to TPC Request frame and Link Management Request frame. Are they not valid as BUs anymore? Where is that documented? | Either remove the exception to TPC request and Link Measurement Request, add the frames to the list of exceptions for BUs, or add a subclause to explain what it means to be an exception and how these frames are handled. | Revised –  The cited sentence has been revised by CID 10581 in 11-22/1412r2 as follows. Exception for BUs has been added in Table 11-3 by the resolution of CID 10581.  *For a non-AP MLD, an AP affiliated with an AP MLD uses the More Data subfield to indicate to a non-AP STA in PS mode affiliated with the non-AP MLD that more BUs, corresponding to Data frames with TIDs that are mapped to this link by the most recent DL TID-to-link mapping (negotiated TID-to-link mapping or default link mapping, see 35.3.7.1 (TID-to-link mapping)) or bufferable Management frames (see Table 11-3 and 35.3.12.4 (Traffic indication))(#10581) are buffered for the non-AP MLD at the AP MLD (see 35.3.7.1.6 (Use of More Data subfield by an MLD)).*  TGbe editor no further changes are needed. |
| 11526 | Xiaofei Wang | 9.4.2.317 | 255.03 | It is unclear what "intended links" are? Also this seems to be inconsistent with the sentence at P255L21. suggest to change to link to which the MMPDU that carries the element applies. | as in comment | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 11526 |
| 13994 | Geonjung Ko | 9.4.2.317 | 255.21 | It is necessary to specify which bit corresponds to which link ID. | As in comment | Revised –  Agree in principle with the commenter.  TGbe editor to make the changes shown in 11-22/1583r2 under all headings that include CID 13994 |
| 11968 | Jarkko Kneckt | 9.4.2.317 | 255.01 | Multi-link Link Id element may request STA to perform measurement on multiple links. How STA responds to such a request, if it desires to make the measurement only on a single link? | Please clarify whether 802.11be allows a STA or AP to request measurement to be done in multiple links with a single request. Please clarify how the measurement response is created if there are statistics for mutliple links. | Rejected –  We have the following statement describing that only one bit is set to 1.  *If dot11EHTBaseLineFeaturesImplementedOnly is equal to true, only one bit in the Link ID bitmap subfield of the Multi-Link Link Information element shall be set to 1.* |
| 12647 | Arik Klein | 35.3.14.1 | 448.57 | according to REVme D1.0 section 1.3.3 the Extended Channel Switch Announcement frame is Class 3 Management frame (Public Action frame). Therefore the or condition in the following sentence is not clear: "The MMPDU is a Class 3 frame or an Extended Channel Switch Announcement frame" | Please revise the condition to: "The MMPDU is a Class 3 frame " or explain what is the uniqueness of the Extended Channel Switch Announcement frame with this context. | Revised –  The cited sentence has been revised by CID 10653 in 11-22/1583r2.  Specifically, extended channel switch is deleted since it is always a broadcast address frame as shown below.  *The Address 1 field of an Extended Channel Switch Announcement frame shall be set to the broadcast address.*  TGbe editor no further changes are needed. |
| 12648 | Arik Klein | 35.3.14.1 | 449.10 | The AP MLD or non-AP MLD does not transmit any frame, but only one of their affiliated AP / non-AP STAs. Please revise the following sentence, as proposed: "An individually addressed MMPDU transmitted by an MLD is intended ..." | Please revise the sentence as follows: "An individually addressed MMPDU transmitted by either AP affiliated with AP MLD or non-AP STA affiliated with non-AP MLD is intended ..." | Revised –  Agree in principle with the commenter. We simply add “through an affiliated STA” like other places of the draft.  TGbe editor to make the changes shown in 11-22/1583r4 under all headings that include CID 12648 |

**Discussion: None**

*TGbe editor: Change 9.4.2.317 MLO Link Information element as follows (track change on):*

**9.4.2.317 MLO Link Information element(#10573)**The (#10573) MLO Link Information element is carried in an individually addressed Management frame to identify the link where the intended STA affiliated with the peer MLD is operating on and is the intended recipient of the contents of the Management frame carrying this element .(#11526)

The (#10573) MLO Link Information element is defined in Figure 9-1002at (MLO Link Information element format(#10573)).



The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The Link ID Bitmap field indicates the link(s) where the intended STA(s) are operating on (see 35.3.3.2  
(Link ID). A value of 1 in bit position *i* of the Link ID Bitmap field indicates link ID *i*.(#13994)

*TGbe editor: Change 9.3.3.13 Action frame format as follows (track change on):*

* Action frame format

The frame body of an Action frame contains the information shown in Table 9-71 (Action frame body and Action No Ack frame body).

|  |  |
| --- | --- |
| * Action frame body and Action No Ack frame body | |
| Order | Information |
| 1 | Action |
| Last - 4 | The MLO Link Information is present as defined in 35.3.14.2 (Identification of the Intended STA).  Otherwise, not present.(#10324) |
| Last – 3 | One or more Vendor Specific elements are optionally present.  These elements are absent when the Category subfield of the Action field is Vendor-Specific, Vendor-Specific Protected, (#125)or when the Category subfield of the Action field is VHT and the VHT Action subfield of the Action field is VHT Compressed Beamforming or when the Category subfield of the Action field is HE and the HE Action subfield of the Action field is HE Compressed Beamforming/CQI.(11ax) |
| Last – 2 | The MME is present when management frame protection is negotiated (#1636)(#1617), the frame is a group addressed robust Action frame, and (#162)(MBSS only) the category of the Action frame does not support group addressed privacy as indicated by Table 9-79 (Category values); otherwise not present.(#125) |
| Last – 1(#125) | The MIC element is present in a Self-protected Action frame if a (#1900)shared PMK exists between the sender and recipient of this frame; otherwise not present. |
| Last | The Authenticated Mesh Peering Exchange element is present in a Self-protected Action frame if (#125)a (#1900)shared PMK exists between the sender and recipient of this frame; otherwise not present. |
| NOTE 1—The MME appears after any fields that it protects in a group addressed frame. Therefore, it appears last in the frame body to protect the frames as specified in 12.5.3 (Broadcast/multicast integrity protocol (BIP)).  NOTE 2—The MIC element and the Authenticated Mesh Peering Exchange element appear after any fields that they protect in an individually addressed frame. Therefore, they appear last in the frame body. The Authenticated Mesh Peering Exchange element is encrypted and authenticated as specified in 14.5.3 (Construction and processing AES-SIV-protected mesh peering Management frames).(#125) | |

***TGbe editor: Change 35.3.14 as follows (track change on):***

**35.3.14 Multi-link device individually addressed Management frame delivery**

**35.3.14.1 General**

This clause describes rules for individually addressed management frame delivery by a MLD with the exception of the following frames specified below(#10319):

* (#10319)CSI frame
* Noncompressed Beamforming frame
* Compressed Beamforming frame
* VHT Compressed Beamforming frame
* HE Compressed Beamforming/CQI frame
* EHT Compressed Beamforming/CQI frame
* Probe Response frame
* LMR frame
* FTM frame

An MLD with dot11QMFActivated equal to false shall follow the rules described in 10.3.2.14.2 (Transmitter requirements) to determine the sequence number of an individually addressed Management frame (except the frames that are excluded above) that is delivered to the associated MLD.

An MLD with dot11QMFActivated equal to false shall follow the rules as described in 10.3.2.14.3 (Receiver requirements) to discard duplicate individually addressed Management frames (except the frames that are excluded above) that are delivered from the associated MLD.

An MLD with dot11QMFActivated equal to false shall maintain a transmit MMPDU timer for each MMPDU (except the frames that are excluded above). The transmit MMPDU timer shall be started when the MMPDU is passed to the MAC.

For an MLD with dot11QMFActivated equal to false, the frame retry counter and retry limit for each MMPDU that belongs to a TC that requires acknowledgment is implementation specific.

An MLD with dot11QMFActivated equal to false shall continue to deliver the failed individually addressed Management frame (except the frames that are excluded above) to an associated MLD on the setup links subject to additional constraints (see [35.3.7 (Link management)](#bookmark35))) until any of the following conditions occurs:

* The retry limit is met.
* The transmit MMPDU timer for the MMPDU exceeds dot11EDCATableMSDULifetime.
* The individually addressed Management frame is successfully delivered.

Between a MLD and an associated peer MLD, a STA affiliated with the MLD with dot11QMFActivated equal to false shall not transmit other individually addressed Management frames (except the frames that are excluded above) over a setup link while the current individually addressed Management frame (except the frames that are excluded above) being transmitted by any STA affiliated with the same MLD over a setup link has not yet completed to the point of success, failed due to retry limit, or other MAC discard (e.g., lifetime expiration).(#12645)

Between an AP MLD and an associated non-AP MLD subject to additional constraints (see [35.3.7 (Link management)](#bookmark35))(#10651), an MLD may transmit an individually addressed MMPDU, which is intended for one STA(#12650) affiliated with the associated MLD operating on an(#12646) enabled(#14046) link(#12650),(#10320) to another STA (other than the intended STA(#12650)) affiliated with the associated MLD operating on a setup link through a STA affiliated with the MLD operating on the setup link(#12646) (#10651)if the MMPDU satisfies all the following conditions:

(#10651)

* (#10652)The MMPDU is a Class 3 frame (#10653)
* The MMPDU is not a TPC Request frame, a TPC Report frame, a Link Measurement Request frame or a Link Measurement response frame
* The MMPDU is classified as a bufferable MMPDU
* The MMPDU is not one of the frames (#10321)listed at the beginning of [35.3.14.1 (General)](#bookmark61).

NOTE—MMPDU only includes the Frame Body field of the management frame and does not include a MAC header and a frame check sequence (FCS) of the management frame (see 3.2 (Definitions specific to IEEE 802.11)).

Otherwise, an MLD with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not transmit an individually addressed MMPDU, which is intended for one STA(#12650) affiliated with the associated MLD operating on an(#12646) enabled(#14046) link(#12650), (#10322) to another STA (other than the intended STA(#12650)) affiliated with the associated MLD operating on (#12646) a setup link through an STA affiliated with the MLD operating on the setup link(#12646) subject to additional constraints (see [35.3.7 (Link management)](#bookmark35))(#14046).

An individually addressed MMPDU transmitted by an MLD through an affiliated STA(#12648) is intended for a STA affiliated with the peer MLD unless specified otherwise to be intended for an MLD(#12650).(#11749)

Between an AP MLD and a non-AP MLD AP MLD, the following individually addressed MMPDUs shall be intended for an MLD: (#11749)

* Authentication frame that includes a Basic Multi-Link element
* (Re)Association Request/Response frame that includes a Basic Multi-Link element
* Deauthentication frame
* Disassociation frame
* Block Ack Action frame
* SA Query Action frame
* Multi-Link probe request/response
* WNM Sleep Mode Request/Response frame
* TID-To-Link Mapping Request/Response/Teardown frame
* EPCS Priority Access Enable Request/Enable Response/Teardown frame
* EML Operating Mode Notification frame
* SCS Request/Response frame
* MSCS Request/Response frame
* BSS Transition Management Request/Response frame(#11750)

A non-AP MLD may transmit an individually addressed MMPDU that is an Authentication frame that includes a Basic Multi-Link element or a (Re)Association Request frame that includes a Basic Multi-Link element or a Multi-Link probe request or a Deauthentication frame or a Disassociation frame to any AP affiliated with the AP MLD subject to additional constraints (see [35.3.7 (Link management)](#bookmark35)).

An AP MLD may transmit an individually addressed MMPDU that is a Deauthentication frame or a Disassociation frame to any non-AP STA affiliated with the non-AP MLD subject to additional constraints (see [35.3.7 (Link management)](#bookmark35)).

An MLD may transmit an individually addressed MMPDU that is a Class 3 frame that is intended for an associated MLD to any STA affiliated with the associated MLD operating on a setup link through an STA affiliated with the MLD operating on the setup link(#12646) subject to additional constraints (see [35.3.7 (Link management)](#bookmark35)).

**35.3.14.2 Identification of the Intended STA**

Between an AP MLD and a non-AP MLD associated with the AP MLD, an individually addressed MMPDU that is not a TWT Setup frame that includes a Link ID Bitmap subfield in its TWT element and that is intended for one STA(#12650) affiliated with the associated MLD operating on an(#12646) enabled(#14046) link(#12650) shall follow the below procedure:

* If the individually addressed MMPDU is transmitted to another STA (other than the intended STA(#12650)) affiliated with the associated MLD operating on a setup link through an STA affiliated with the MLD operating on the setup link(#12646), then the individually addressed MMPDU shall include MLO Link Information element that identifies the intended link(#12650) of the MMPDU as the last element but before the Vendor Specific element(s) (if present).
* Otherwise, the individually addressed MMPDU may include MLO Link Information element that identifies the intended link(#12650) of the MMPDU as the last element but before the Vendor Specific element(s) (if present).

NOTE—If the MLO Link Information element is not present in the individually addressed MMPDU, the individually addressed MMPDU cannot be retransmitted to different STA as described in the first bullet above.

Between an AP MLD and a non-AP MLD associated with the AP MLD, a TWT Setup frame that includes a Link ID Bitmap subfield in its TWT element shall not include a MLO Link Information element.

If dot11EHTBaseLineFeaturesImplementedOnly is equal to true, only one bit in the Link ID bitmap subfield of the MLO Link Information element shall be set to 1.

Between an AP MLD and a non-AP MLD associated with the AP MLD, an individually addressed MMPDU that is intended for an associated MLD shall not include MLO Link Information element.

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed MMPDU that carries MLO Link Information element is received by a STA affiliated with the MLD, then the MLD shall discard the MMPDU if the MLO Link Information element indicates any link that is not a enabled link(#14046).

*TGbe editor: Change 35.3.12.4 Traffic Indication as follows (track change on):*

**35.3.12.4 Traffic indication**

(…existing texts…)

When an AP affiliated with an AP MLD receives a PS-Poll frame or a U-APSD trigger frame from a STA  
affiliated with an associated non-AP MLD that is in power save mode, it shall transmit buffered BU(s) to the  
STA, if one is available and not discarded for implementation dependent reasons, otherwise it may transmit  
a QoS Null frame.

If a buffered BU is an MMPDU that is intended for one (#12242)non-AP STA affiliated with a non-AP  
MLD (#10581)(see Table 11-3 (Bufferable/nonbufferable classification of MMPDUs)), and if it is  
transmitted on a link where another STA (other than the intended STA) affiliated with the same non-AP  
MLD is operating on, following the procedure above, the MMPDU shall carry information to determine the  
intended destination (#12242)non-AP STA affiliated with the non-AP MLD (see 35.3.14.2 (Identification of  
the Intended STA))

NOTE – If a buffered MMPDU  that is intended for one (#12242)non-AP STA affiliated with a non-AP  
MLD (#10581)(see Table 11-3 (Bufferable/nonbufferable classification of MMPDUs)), the MMPDU does not carry information in the framebody to determine the intended destination non-AP STA affiliated with the non-AP MLD or does not have correct content to be transmitted to another non-AP STA affiliated with a non-AP MLD, and the MMPDU needs to be transmitted due to reception of a PS-Poll frame or a U-APSD trigger frame from another non-AP STA affiliated with an associated non-AP MLD that is in power save mode, then the MMPDU needs to be discarded. (#12815)

(…existing texts…)

*TGbe editor: Add the following paragraphs after existing text in 35.8.2 Individual TWT Agreements as follows: (#13386)*

35.8.2 Individual TWT Agreements

(…existing texts …)

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed TWT information frame for individual TWT, which is intended for one STA affiliated with the associated MLD with a setup link, is transmitted to another STA affiliated with the associated MLD with a setup link and an acknowledgement in response to the TWT information frame is received, then the TWT requesting STA of the intended link shall consider the corresponding TWT agreement of the intended link suspended starting from the TWT SP of the respective TWT agreement that occurs immediately after the TWT information frame exchange rather than immediately as described in 26.8.4.2 (TWT Information frame exchange for individual TWT).

*TGbe editor: Add a new subclause in 35.8 TWT Operation as follows: (#13386)*

35.8.3 Broadcast TWT operation

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed TWT information frame for broadcast TWT with All TWT subfield set to 1, which is intended for one STA affiliated with the associated MLD with a setup link, is transmitted to another STA affiliated with the associated MLD with a setup link and an acknowledgement in response to the TWT information frame is received, then the TWT scheduled STA of the intended link shall consider all the broadcast TWT schedules as suspended starting from the broadcast TWT schedule of the intended link that occurs immediately after the TWT information frame exchange rather than immediately as described in 26.8.4.3 (TWT Information frame exchange for broadcast TWT).

*TGbe editor: Add a new subclause in 35.8 TWT Operation as follows: (#13386)*

35.8.4 flexible wake time operation

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed TWT information frame for flexible wake time, which is intended for one STA affiliated with the MLD with a setup link, is received by another STA affiliated with the MLD with a setup link, then the corresponding PM mode change and power state change for the STA of the intended link shall start after the existing TXOP that includes the individually addressed TWT information frame rather than immediately as described in 26.8.4.4 (TWT Information frame exchange for flexible wake time).

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed TWT information frame for flexible wake time, which is intended for one STA affiliated with the associated MLD with a setup link, is transmitted to another STA affiliated with the associated MLD with a setup link and an acknowledgement in response to the TWT information frame is received by the transmitting STA affiliated with the MLD, then the corresponding PM mode change and power state change for the STA of the intended link shall start after the existing TXOP that includes the individually addressed TWT information frame rather than immediately as described in 26.8.4.4 (TWT Information frame exchange for flexible wake time).