### IEEE P802.11Wireless LANs

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| 11be D1.0 CR for missing elements-in-clause 6-3 |
| Date: 2022-02-14 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Zhiqiang Han | ZTE Corporation |  |  | han.zhiqiang1@zte.com.cn |
| Yan Li | ZTE Corporation |  |  | li.yan16@zte.com.cn |

Abstract

This submission proposes resolutions for the following 9 CIDs:

CID : 4134,4135,6165,~~7757,7758~~,7771,8257,7836,5648,6167,7381

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Modify the description about the TID-To-Link Mapping element and Multi-Link element
* Rev 2: Add three CIDs (5648,6167,7381) into this document.
* Rev 3 : Update the description in scan.confirm primitive based on Xiangxin’s comment
* Rev 4 : Based on Laurent and Mike’s suggestion, I remove CID 7757 and 7758 from this document. These two comments suggest to add Multi-link element in scan primitives but currently, ML Probe Request is a Probe Request frame that is transmitted without following 11.1.4.3.2 (Active Scanning), so we don’t use scan primitive for ML Probe Request but we need some primitives to trigger ML Probe Request frame. And currently, there are some discussion about ML Probe Request, when there are conlusions about this issue, we can update subclause 6.3. So it’s safest to hold changes on this to next round.

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 D1.4 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe D1.4 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** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4134 | Alfred Asterjadhi | 51.01 | 6 | Seems the list of elements in the respective subclauses of this clause is incomplete. PLease check that all newly defined elements in clause 9 are added in the respective locations in this clause. | As in comment. | **Revised**Agree that the text should be updated in the respective locations in this clause according to all newly defined elements in clause 9.**TGbe editor: please incorporate changes shown in 11-21/0226r4 under the tag 4134** |
| 4135 | Alfred Asterjadhi | 51.01 | 6 | I see that request/responses portions for NSEP are added, but several others appear to be missing. For example TID to Link mapping, etc. Check what is missing and add accordingly | As in comment. | **Revised**Agree that this text should be updated. TID to link mapping should be added in the (Re)association related primitives in clause 6.**TGbe editor: please incorporate changes shown in 11-21/0226r4 under the tag 4134** |
| 6165 | Michael Montemurro | 51.01 | 6 | The ML element needs to be in mlme.join and mlme.start primitives. That would clean up the terminology issues with Authenticate/Associate/ | Update mlme.start and mlme.join to support MLO. There needs to be a way for an MLD invoke something to join or start a BSS, At keast explain how this works for MLO. | **Revised**Agree that the ML element should be added in MLME-START and MLME-JOIN primitives.**TGbe editor: please incorporate changes shown in 11-21/0226r4 under the tag 6165** |
| ~~7757~~ | ~~Yanchao Xu~~ | ~~51.19~~ | ~~6.3.3.2.2~~ | ~~(Probe Request variant) Multi-Link Element should be inlcuded In MLME-SCAN.request~~ | ~~as comments~~ | **~~Revised~~**~~Agree that the Multi-Link element should be included in MLME-SCAN.request~~**~~TGbe editor: please incorporate changes shown in 11-21/0226r3 under the tag 7757~~** |
| ~~7758~~ | ~~Yanchao Xu~~ | ~~52.01~~ | ~~6.3.3.3.2~~ | ~~(Basic variant) Multi-Link Element of peer MLD should be inlcuded In MLME-SCAN.confirm~~ | ~~as comments~~ | **~~Revised~~**~~Agree that the Multi-Link element should be included in MLME-SCAN.confirm.~~**~~TGbe editor: please incorporate changes shown in 11-21/0226r3 under the tag 7758~~** |
| 7771 | Yanchao Xu | 56.13 | 6.3.7.2 | Please include TID-To-Link Mapping Element in the (Re)ASSOCIATE related primitives | as comments | **Revised**Agree that this text should be updated because TID-To-Link Mapping element has been present in (Re)Association request/response frame, the (Re)Association related primitives should be updated.**TGbe editor: please incorporate changes shown in 11-21/0226r4 under the tag 4134** |
| 8257 | Zhiqiang Han | 56.38 | 6.3.7.2.2 | TID-To-Link Mapping element shall be included in the parameters. | Please add TID-To-Link Mapping element into MLME-ASSOCIATE.request primitive. | **Revised**Agree that this text should be updated because TID-To-Link Mapping element has been present in (Re)Association request/response frame, the (Re)Association related primitives should be updated.**TGbe editor: please incorporate changes shown in 11-21/0226r4 under the tag 4134** |
| 7836 | Yonggang Fang | 0.00 | 6.3.12 | In the clause 6.3.12 of 802.11md, it describes SME to stop infrastructure BSS. This clause should be modified to support SME to stop infrastructure BSS of MLD. | Please update the clause 6.3.12 to support SME to stop infrastructure BSS of MLD. | **Revised****Agree in principle with comments. Beacause the multi-link operation is added in the spec, this clause should support to stop infrastructure BSS of MLD.****TGbe editor: please incorporate changes shown in 11-21/0226r4 under the tag 7836** |
| 5648 | Joseph Levy | 66.36 | 6.3.39.2.1 | What is a peer MLD? How can an MLD be associated with an MLD? Association is a concept that includes entities beyond the MLD (BS, ESS, DS). A non-AP MLD does not associated with an AP MLD, as association is with a BS or an ESS and involves the DS. Note: this phase "peer MLD" occurs in multiple location (66.45, 66.56, 67.1, 67.22, 67.31, 67.41, 161.14, 189.2, 192.40, 205.41, .... a total of 22 instances). All occurrences should be addressed. | Define what a peer MLD is and how this relates to association. Correct the statement that the MLD is some how associated to the "peer" MLD. Make these changes at all location where this phrase is used. | **Rejected**A peer STA is present in 802.11-2020, there is no definition of a peer STA. Everyone can know what it means. So a definition of peer MLD is not needed.In the lastest TGbe D1.4 Draft, the draft uses the common term “MLD assocation”: Association between a non-AP MLD and an AP MLD is called MLD association(4.5.3.3 Association). 11.3(Authentication and association) and 35.3.5 (Multi-link (re)setup) gives more details, the problem has been solved in the lastest Draft, so there is no need to describe how an MLD can be associated with an MLD here.  |
| 6167 | Michael Montemurro | 66.36 | 6.3.39.2 | The STA authenticator would have no state associated with an MLD association. | At 66.36 and 66.45, change "or be sent to an affiliated STA of the specified peer MLD to which the MLD is associated." to "or be sent to an the specified peer MLD to which the MLD is associated."At 66.56, change "The STA then attempts to transmit this to the peer STA with which it is associated or a STA affiliated with the MLD attempts to transmit this to another STA affiliated with the peer MLD with which the MLD is associated on the corresponding link." to "The STA or MLD then attempts to transmit this to the peer STA, or MLD with which it is associated on the corresponding link."At 67.22 and 67.31, change "or to a STA affiliated with the peer MLD" to "or MLD"At 67.39, change "The STA then attempts to transmit this to the STA indicated by the PeerSTAAddress parameter or a STA affiliated with the MLD then attempts to transmit this to a STA affiliated with the peer MLD indicated by the PeerSTAAddress parameter." to "The STA or MLD then attempts to transmit this to the STA or MLD indicated by the PeerSTAAddress parameter." | **Rejected**According to clause 4.9.5 Reference model for multi-link operation (MLO), An MLD supports multiple MAC sublayers, coordinated by an SME. The SME maintains the authentication and association states. Each affiliated STA of an MLD has one MLME , and All the MLMEs are coordinated by an SME.The subclause 6.3 describes the MLME SAP interface, SME will use services provided by one MLME through the MLME SAP to tigger the frame to transmit frames in MLD scenarios.The frame is transmitted by a STA affiliated with a MLD to a peer STA affiliated with a peer MLD. But the the functionality is the MLD level(i.e., MLD association).So It’s better to keep the description between two STAs, it’s more clearer. |
| 7381 | Stephen McCann | 66.36 | 6.3.39.2.1 | Regarding the text "...be sent to an affiliated STA of the specified peer MLD to which the MLD is associated.", is the MLD associated to the affiliated STA or to the specified peer MLD? | Change the cited sentence extract to ""...be sent to an affiliated STA of the specified associated peer MLD." | **Rejected**The sentence describes the MLD is associated to the specified peer MLD. Agree that the suggestion has the same meaning as the cited sentence. But if we change the sentence to “be sent to an affiliated STA of the specified associated peer MLD, there will be a new term “the specified associated peer MLD”. It will make the text unclear and need more explanation.So It’s better to keep the text unchanged. |

**~~6.3.3 Scan~~**

**~~6.3.3.2 MLME-SCAN.request~~**

~~Change the primitive parameters as follows (not all existing parameters are shown):~~

~~The primitive parameters are as follows:~~

~~MLME-SCAN.request(~~

~~…,~~

~~EHTCapabilities,~~

~~MultiLink,~~

~~VendorSpecificInfo~~

 ~~)~~

|  |  |  |  |
| --- | --- | --- | --- |
| ~~Name~~ | ~~Type~~ | ~~Valid range~~ | ~~Description~~ |
| ~~...~~ |  |  |  |
| ~~MultiLink(#7757)~~ | ~~Probe Request Multi-Link element~~ | ~~As defined in~~ ~~9.4.2.312 (Multi-~~~~Link element)~~ | ~~Indicates the Multi-Link parameters of~~ ~~the MLD. This parameter is present if~~ ~~dot11MultiLinkActivated is true and is~~ ~~absent otherwise.~~ |
| ~~VendorSpecificInfo~~  |  ~~A set of elements~~  | ~~As defined in~~ ~~9.4.2.25 (Vendor~~ ~~Specific element)~~ | ~~Zero or more elements.~~ |

**~~6.3.3.3 MLME-SCAN.confirm~~**

**~~6.3.3.3.2 Semantics of the service primitive~~**

~~Insert the following rows to the untitled IBSS adoption table as follows:~~

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ~~Name~~ | ~~Type~~ | ~~Valid range~~ | ~~Description~~ | ~~IBSS adoption~~  |
| ~~...~~ |  |  |  |  |
| ~~MultiLink(#7758)~~ | ~~Basic Multi-Link element~~ | ~~As defined in~~ ~~9.4.2.312 (Multi-~~~~Link element)~~ | ~~The value from the Multi-Link element. The~~ ~~parameter is present if dot11MultiLinkActivated is true and a Multi-Link element was present in the Probe~~ ~~Response or Beacon frame from which the BSSDescription was determined. Otherwise, the parameter is not present.~~ | ~~Do not adopt~~ |

**6.3.4.2 MLME-JOIN.request**

**6.3.4.2.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-JOIN.request(

…,

EHTCapabilities,

MultiLink,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| MultiLink(#6165) | Basic Multi-Link element | As defined in 9.4.2.312 (Multi-Link element) | Indicates the Multi-Link parameters of the MLD. This parameter is present if dot11MultiLinkActivated is true and is absent otherwise. |
| VendorSpecificInfo  |  A set of elements  | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.7.2 MLME-ASSOCIATE.request**

**6.3.7.2.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-ASSOCIATE.request(

 ...

TID-To-Link Mapping,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| MultiLink | Basic Multi-Link element(#6700) | As defined in 9.4.2.312 (Multi-Link element) | Indicates the Multi-Link parameters of the MLD. This parameter is present if dot11MultiLinkActivated is true and is absent otherwise. |
| TTID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo  |  A set of elements  | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.7.3 MLME-ASSOCIATE.confirm**

**6.3.7.3.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

 MLME-ASSOCIATE.confirm(

...

EHTCapabilities,

EHTOperation,

MultiLink,

TID-To-Link Mapping，

VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TTID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.7.4 MLME-ASSOCIATE.indication**

**6.3.7.4.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-ASSOCIATE.indication(

...

EHTCapabilities，

MultiLink，

TID-To-Link Mapping,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the peer STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.7.5 MLME-ASSOCIATE.response**

**6.3.7.5.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-ASSOCIATE.response(

...

EHTCapabilities,

EHTOperation,

MultiLink,

TID-To-Link Mapping,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the peer STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.8.2 MLME-REASSOCIATE.request**

**6.3.8.2.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-REASSOCIATE.request(

...

EHTCapabilities,

MultiLink,

TID-To-Link Mapping,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.8.3 MLME-REASSOCIATE.confirm**

**6.3.8.3.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-REASSOCIATE.confirm(

...

EHTCapabilities,

EHTOperation,

MultiLink,

TID-To-Link Mapping,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.8.4 MLME-REASSOCIATE.indication**

**6.3.8.4.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-REASSOCIATE.indication(

...

EHTCapabilities,

MultiLink,

TID-To-Link Mapping,

VendorSpecificInfo

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the peer STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

)

**6.3.8.5 MLME-REASSOCIATE.response**

**6.3.8.5.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-REASSOCIATE.response(

...

EHTCapabilities,

EHTOperation,

MultiLink,

TID-To-Link Mapping,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| TID-To-Link Mapping(#4134) | TID-To-Link Mapping element | As defined in 9.4.2.314 （TID-To-Link Mapping element） | Indicates links on which frames belonging to each TID can be exchanged. This parameter is present if dot11MultiLinkActivated is true, dot11TIDtoLinkMappingActivated is true, and the peer STA affiliated with an MLD initiates both an MLD association and a TID-to-link mapping negotiation. Otherwise it is not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.11.2 MLME-START.request**

**6.3.11.2.2 Semantics of the service primitive**

Change the primitive parameters as follows (not all existing parameters are shown):

The primitive parameters are as follows:

MLME-START.request(

…,

EHTCapabilities,

EHTOperation,

MultiLink,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ... |  |  |  |
| MultiLink(#**6165**) | Basic Multi-Link element | As defined in 9.4.2.312 (Multi-Link element) | Indicates the Multi-Link parameters of the MLD. This parameter is present if dot11MultiLinkActivated is true and is absent otherwise. |
| VendorSpecificInfo  |  A set of elements  | As defined in 9.4.2.25 (Vendor Specific element) | Zero or more elements. |

**6.3.12 Stop**

**6.3.12.2.3 When generated**

***TGbe editor: Please update the subclause as shown below***

This primitive is generated by the SME to terminate an infrastructure BSS (with the MAC entity within an AP or an MLD(#7836)) or a PBSS (with the MAC entity within the PCP). The MLME-STOP.request primitive shall be generated only after successful use of an MLME-START.confirm primitive.