IEEE P802.11
Wireless LANs

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| CC36 CR for ML element usage |
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Abstract

This submission proposes resolutions of comments received from TGbe comment collection CC36 based on TGbe D1.2.

* 4048 5054 6269 5053 4255 4256 7407 5051 5369 5979 6199 6200 6263 6266 6267 6268 6604 7669 (18 CIDs)

Revisions:

* Rev 0: Initial version of the document.
1. **Introduction**

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbe Draft. The introduction and the explanation of the proposed changes are not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11be 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** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 4048 | 35.3.4.4 | 254.01 | Describing the setting for each subfield is duplicative and leads to the case where some (sub)fields may be missed. Same comment applies to 35.3.5.4 (2 instances) | Delete the bullets and make a reference to clause 9 for the format of the Common Info field of Basic variant Multi-Link element | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 4048. |
| 5054 | 35.3.4.4 | 254.04 | Setting of the Presence indicators need not be covered in Clause 35. These are covered in Clause 9. Clause 35 can simply list which subfields are present in the Common Info field. It is implied that their corresponding presence indicators will be set to 1 in the Multi-Link Control field | As in comment | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 5054. |
| 6269 | 35.3.4.4 | 254.04 | These three bullets could be further simplified because of the same settings for these three present subfields. | as in the comment | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 6269. |
| 5053 | 35.3.4.4 | 254.14 | The Common Info field of the Multi-Link element carried in beacon and probe response frames should also carry the MLD Capabilities subfield. During Discovery, the non-AP MLD must know if the AP supports TID-to-Link mapping. Without this, the non-AP cannot initiate a TID-to-Link mapping negotiation during Association. | Add MLD Capabilities to the list of subfields carried in the Beacon and Probe Response frames | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 5053. |
| 4255 | 35.3.4.4 | 254.15 | Merge these three sentences into one paragraph. Ia a Probe Request is not an ML probe request then the probe request shall not contain an ML element; otherwise the probe request shall contain a Probe Request variant Mle element" | As in comment. | Rejected-These three sentences can not merged into one sicne there may exisit other variant probe request, like TDLS variant multi-link element under discussion. |
| 4256 | 35.3.4.4 | 254.26 | Lifetime of the AP MLD can be very long... I think you mean during the lifetime of each of the BSSes that are setup by the AP MLD. | As in comment. | Revised-Agree with the comment. Propose resolution to account for the suggestd changeTGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 4256. |
| 7407 | 35.3.4.4 | 254.26 | What is the lifetime of an AP MLD? | As in comment | Revised-To answer the question of the commenter, change it to “the lifetime of each of the BSSes that are setup by the AP MLD”TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 7407. |
| 5051 | 35.3.4.4 | 254.26 | Replace "AP of an AP MLD" with "AP affiliated with an AP MLD" | As in comment | Accepted- |
| 5369 | 35.3.4.4 | 254.08 | non-AP MLD uses Link ID to retrieve other APs affiliated with same AP MLD via ML probe request.but Link ID of other APs doesn't appear in ML element in Beacon and probe response.Seems it's a bug for non-AP MLD to know other APs Link ID first before performing ML probe request.Besides, RNR is optional element, we can't expect RNR always appearing in Beacon frame. | The Link ID of other APs affiliated with same AP MLD shall be carried in ML in Beacon and probe response frame. | Rejected-Link IDs of other APs are located in RNR element and RNR elmenet is mandatory for the AP MLD |
| 5979 | 35.3.4.4 | 254.19 | With the paragraph in L22, L19 paragraph is not needed. Otherwise, other variant ML elements should also be mention here. | As in comment | Revised-The corresponding sentence was updated based on the resolution of CID 1192 as per 802.11be D1.3. To TGbe editor:There is no any text change for this CID. |
| 6199 | 35.3.4.4 | 253.56 | I believe this standard includes requirements, not rules. | Change "usage rules in the context of" to "usage requirements for" | Rejected-“rules” is widely used in the Spec, like rate selection rules, A-MPDU length limit rules |
| 6200 | 35.3.4.4 | 253.60 | If it's a Beacon or Probe Response frame, its clearly not a ML Probe Response frame based on the earlier text. | Delete ", which is not an ML probe response," at the cited location. | Rejected-Although it is clearly not a ML Probe Response frame for the commenter, the change is added to address the comment on the other side such that there is no any ambiguity. |
| 6263 | 35.3.4.4 | 254.23 | Could either A1 field or A2 field be set to the MAC address of non-transmitted BSSID affliated with an MLD in ML Probe Request frame if the intended receiver is transmitted BSSID. Please disallow it since we have have motion text "The value of the Address 1 (RA) field in the MAC header of an individually addressed frame sent over-the-air shall be the MAC address of the receiving STA affiliated with the MLD corresponding to that link." in 35.3.3 Multi-link device addressing and the link is wireless interface between two STAs. | as in the comment | Revised-This comment was addressed by 21/1399r3, there is no any change on the text in 802.11be draft 1.2 |
| 6266 | 35.3.4.4 | 253.59 | subclause 35.3.4.2 describes the ML element usage for discovery-Probe Request/Response, this belongs to the coverage of subclause 35.3.4.4 (Multi-Link element usage rules in the context of discovery) | Move subclause 35.3.4.2 into subclause 35.3.4.4 | Accepted- |
| 6267 | 35.3.4.4 | 253.59 | The part of ML element common part for non-transmitted BSSID advertisement carried in Beacon or Probe Response frame is missing | Please make it complete as in the comment | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 6267. |
| 6268 | 35.3.4.4 | 253.59 | Regular (non-ML) Probe request could also be used to solicit the info of any AP in an AP MLD based on received basic info carried in RNR ele-ment, this part is missing | A corresponding contribution (DCN1108 and 0467) is submitted | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 6268. |
| 6604 | 35.3.4.4 | 267.17 | in D1.1, The unique link ID shall be the same for all associated non-AP MLD. | Change the sentence to "An AP of an AP MLD shall have a unique link ID, which is indicated to all associated non-AP MLD if the link is requested, that shall not change during the lifetime of the APMLD." | Revised-Agree with the comment in principle. Propose resolution to account for the suggested change.TGbe editor to make the changes shown in 21/1713r0 under all headings that include CID 6204. |
| 7669 | 35.3.4.4 | 254.26 | Each AP MAC address is mapped to link ID? | See comment. | RejectedThere is no any change on the text related to the comment.To answer the commenter, the value carried in the Link ID subfield is a representation of the tuple consisting of Operating Class, Operating Channel, and BSSID of the AP affiliated with the AP MLD according to P320 L40 in 802.11be draft 1.2 |

**Discussion:** None.

**35.3.4.4 Multi-Link element usage rules in the context of discovery**

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

If an AP affiliated with an AP MLD is not in a multiple BSSID set or the AP corresponds to a transmitted BSSID in a multiple BSSID set, the AP shall include, in a Beacon frame or a Probe Response frame, which is not an ML probe response, only the Common Info field of the Basic Multi-Link element for the AP MLD as defined in 9.4.2.295b (Multi-Link element) unless conditions in 35.3.10 (Multi-link general procedures) are satisfied. (#CID 6267)

If an AP affiliated with an AP MLD corresponds to a nontransmitted BSSID in a multiple BSSID set, then the AP that corresponds to the transmitted BSSID in the same multiple BSSID set shall include, in the Nontransmitted BSSID Profile corresponding to the nontransmitted BSSID in a Beacon frame or a Probe Response frame, which is not an ML probe response, only the Common Info field of the Basic Multi-Link element for the AP MLD as defined in 9.4.2.295b (Multi-Link element) unless conditions in 35.3.10 (Multi-link general procedures) are satisfied. (#CID 6267)

The Common info field of the Basic Multi-Link element carried in the Beacon frame or Probe Response frame, which is not an ML probe response, shall include MLD MAC address, the Link ID Info, the BSS Parameters Change Count, the EML Capabilities and the MLD Capabilities subfields, and shall not include the Medium Synchronization Delay Information subfield. (#CID 4048, 5054, 6269, 5053)

A Probe Request frame that is not an ML probe request shall not include a Multi-Link element of any type.

A Probe Request frame that is an ML probe request shall include a Probe Request Multi-Link element and shall not include other variant Multi-Link element.

An AP affiliated with (#CID5051) an AP MLD shall have a unique link ID that is advertised to all the associated non-AP MLD and (#CID 6204) shall not change during the lifetime of each of the BSSes that are setup by the AP MLD (#CID 4256, 7407). The Link ID field in the per-STA profile corresponding to this AP in the Multi-Link element corresponding to this AP MLD shall be set to the unique link ID value of this AP.

**11.1.4.3.4 Criteria for sending a response (11ai)**

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

If a STA that receives a Probe Request frame is not in a multiple BSSID set, that STA shall send the Probe Response frame(s), subject to the criteria below. If a STA that receives a Probe Request frame is in a multiple BSSID set, the STA corresponding to the transmitted BSSID shall send the Probe Response frame(s), subject to the criteria below; other STAs in the multiple BSSID set shall not send a Probe Response frame.

A STA that receives a Probe Request frame shall not respond if any of the following apply:

a) The STA does not match any of the following criteria:

1) The STA is an AP.

2) The STA is an IBSS STA.

3) The STA is a mesh STA.

4) The STA is a DMG STA that is not a member of a PBSS and that is performing active scan as defined in 11.1.4.3.3 (Active scanning procedure for a DMG STA).

5) The STA is a PCP.

b) The Address 1 field of the Probe Request frame contains an individual address and one of the following criteria is met:

1) The STA is not a member of a multiple BSSID set and is not affiliated with an MLD (#CID 6268), and the individual address is not the MAC address of the STA.

2) The STA is a member of a multiple BSSID set and is not affiliated with an MLD (#CID 6268), and the individual address does not match the BSSID of any of the BSSs in the multiple BSSID set.

3) The STA is not a member of a multiple BSSID set and is affiliated with an MLD, and the individual address does not match the MAC address of any of the APs in the MLD (#CID 6268).

4) The STA is a member of a multiple BSSID set and is affiliated with an MLD, and the individual address does not match the MAC address of any of the APs in the MLD and the BSSID of any of the BSSs in the multiple BSSID set. (#CID 6268)

c) The STA is a non-AP STA in a DMG infrastructure BSS and the Address 1 field of the Probe Request frame contains the broadcast address.

d) The STA is a non-PCP STA in a PBSS and the Address 1 field of the Probe Request frame contains the broadcast address.

e) The STA is in an IBSS and did not transmit a Beacon or DMG Beacon frame since the last TBTT, and the Address 1 field of the Probe Request frame contains the broadcast address.

f) The STA is a mesh STA and either of the following criteria are met:

1) The Probe Request frame does not contain a Mesh ID element.

2) The Mesh ID element in the Probe Request frame is present but does not contain the wildcard Mesh ID and does not match the Mesh ID of the MBSS with which the STA is peered.

g) The STA is not a mesh STA and none of the following criteria are met:

1) The SSID in the Probe Request frame is the wildcard SSID.

2) The SSID in the Probe Request frame matches the SSID of the STA’s BSS.

3) The STA is a member of a multiple BSSID set and the SSID in the Probe Request frame matches any of the SSIDs of the members of that multiple BSSID set.

4) The SSID List element is present in the Probe Request frame and includes the SSID of the STA’s BSS.

h) The STA is not a mesh STA and the Address 3 field of the Probe Request frame does not contain a wildcard BSSID and one of the following criteria is met:

1) The STA is not a member of a multiple BSSID set and is not affiliated with an MLD (#CID 6268), and the Address 3 field of the Probe Request frame does not match the BSSID of the STA’s BSS.

2) The STA is a member of a multiple BSSID set and is not affiliated with an MLD (#CID 6268), and the Address 3 field of the Probe Request frame does not match the BSSID of any of the BSSs in the multiple BSSID set.

3) The STA is not a member of a multiple BSSID set and is affiliated with an MLD, and the Address 3 field of the Probe Request frame does not match the BSSID of any of the BSSs in the MLD. (#CID 6268)

4) The STA is a member of a multiple BSSID set and is affiliated with an MLD, and the Address 3 field of the Probe Request frame does not match the BSSID of any of the BSSs in the MLD and the BSSID of any of the BSSs in the multiple BSSID set. (#CID 6268)