IEEE P802.11  
Wireless LANs

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| LB275 CR for ML Reconfiguration part 6 | | | | |
| Date: November 1, 2023 | | | | |
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Abstract

This submission proposes resolutions for following CIDs received for TGbe LB275:

20066, 19538

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Added revised version with resolution for 19538, plus changes during the call

***TGbe editor: The baseline for this document is 11be D4.1.***

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. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e., they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

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| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 20066 | Binita Gupta | AF.4 | 1008.18 | It would be good to show an example of ML reconfiguration to the ML setup for link add/delete as captured by procedure in 35.3.6.4. | Add a subclause showing an example of ML reconfiguration to the ML setup. | Revised  Added subclause showing examples for link reconfiguration to the ML setup.  TGbe editor, please make the changes tagged by CID #20066 in 11-23/1770r1. |
| 19538 | Sigurd Schelstraete | AF.2.3 | 1000.36 | The examples in appendix AF are generally very useful, but not all sections provide the same depth of explanation. Section AF2.3 essentially just provides figures without accompanying explanation (as in e.g. AF.2.2 or AF.2.1) | Provide explanation of the figures in AF2.3. A similar comment applies to AF.3.1 and AF.3.2. | Revised  Added text describing figures illustrating contents of management frames for ML reconfiguration AP removal procedure.  TGbe editor, please make the changes tagged by CID #19538 in 11-23/1770r1. |

***﻿ TGbe editor: Please update this subclause as shown below (#19538):***

**AF.2.3 Contents of Management frames during ML reconfiguration affiliated AP removal procedure**

﻿The following figures in this subclause, provide illustrations showing the content of Management frames during ML reconfiguration affiliated AP removal procedure for certain selected scenarios. The figures are meant to provide an overview of content, location, and order of certain elements. The illustrations do not show all the possible scenarios.

In the following figures, content of Management frames during ML reconfiguration affiliated AP removal procedure are illustrated as follows:

* ﻿A Beacon frame or Probe Response frame that is not a multi-link probe response advertising removal of a reported AP, where the transmitting AP is not a member of a multiple BSSID set, in Figure AF-4 (Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing a reported AP (non-multiple BSSID scenario)).
* A Beacon frame or Probe Response frame that is not a multi-link probe response advertising removal of the transmitting AP, where the transmitting AP is not a member of a multiple BSSID set, in Figure AF-5 (Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing the transmitting AP (non-multiple BSSID scenario)).
* A Beacon frame or Probe Response frame that is not a multi-link probe response advertising removal of an AP affiliated with the AP MLD of the transmitted BSSID of a multiple BSSID set, in Figure AF-6 (Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of the transmitted BSSID).
* A Beacon frame or Probe Response frame that is not a multi-link probe response advertising removal of an AP affiliated with the AP MLD of a nontransmitted BSSID of a multiple BSSID set, in Figure AF-7 (Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of a nontransmitted BSSID).
* A multi-link probe response advertising removal of an AP affiliated with the AP MLD of the transmitted BSSID, in Figure AF-8 (Contents of a multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of the transmitted BSSID, when the soliciting frame was directed to the transmitted BSSID)
* A multi-link probe response advertising removal of an AP affiliated with the AP MLD of the nontransmitted BSSID, in Figure AF-9 (Contents of a multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of a nontransmitted BSSID, ﻿when the soliciting frame was directed to nontransmitted BSSID corresponding to index 5).



(non-EHT) elements of the transmitting AP

AP entries

EHT Operation

Common Info

Common Per-STA Info profile

EHT

Capabilities

Beacon frame or a non-ML probe response

…

…

…

Link ID=1 Link ID=2

Link ID=1

Reduced

Neighbor Report element

Reconfig Multi- Link element

Basic Multi-Link element

**Figure AF-4—Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing a reported AP (non-multiple BSSID scenario)(#20062)(#20064)**



(non-EHT) elements of the transmitting AP

AP entries

EHT Operation

Common Info

Common Per-STA

Info

profile

EHT

Capabilities

Beacon frame or a non-ML probe response

…

…

Reduced Neighbor Report element

…

Basic Multi-Link element

Reconfig Multi- Link element

Link ID=1 Link ID=2

Link ID=0

**Figure AF-5—Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing the transmitting AP (non-multiple BSSID scenario)(#20064)**



(non-EHT) elements of Nontransmitted the transmitting AP BSSID profiles

Other profile specific elements

AP MLD ID=0

Link ID=1

AP entries

EHT

Operation

Common Info

Common Per-STA

EHT

Info

profile Capabilities

Beacon frame or non-ML probe response

…

Multiple

… BSSID …

…

…

…

… Basic Multi-

Link element

Reconfig Multi- Link element

Basic Multi-

Common

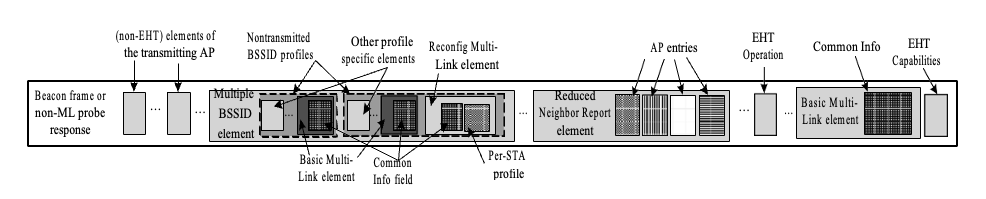
Link ID=1

element

Reduced

Neighbor Report element

**Figure AF-6—Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of the transmitted BSSID(#20062)(#20063)**

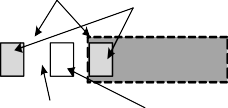


**Figure AF-7—Contents of a Beacon frame or a non-multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of a nontransmitted BSSID(#20062)(#20063)**

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**Figure AF-8—Contents of a multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of the transmitted BSSID, when the soliciting frame was directed to the transmitted BSSID (#20062)(#20063)**

…



(non-EHT) elements of the transmitting AP

Link ID=1

Nontransmitted Other profile Reconfig Multi- BSSID profiles specific elements Link element

AP entries

EHT

Operation

Common Info

Common EHT

Info Capabilities

ML probe response (nonTxBSSID)

… …

… Reduced Neighbor Report element

… …

Index=3 Basic Multi- Index=5 Common Per-STA

Link element

Per-STA profiles

Info field profile

AP MLD ID = Index = 5

AP MLD ID=5

Basic Multi-Link element (Tx)

Basic Multi-Link element (nonTx)

Multiple

BSSID …

element

AP MLD ID=5

Link ID=1

Link ID=0

**Figure AF-9—Contents of a multi-link probe response during ML reconfiguration affiliated AP removal procedure for removing an AP affiliated with the AP MLD of a nontransmitted BSSID, ﻿when the soliciting frame was directed to nontransmitted BSSID corresponding to index 5 (#20062)(#20065)**

﻿ ***TGbe editor: Please add following new subclause right after the subclause AF.4 (Example of ML setup) (#20066):***

AF.x Examples of link reconfiguration to ML setup

Figure AF-xx1 (An example of link reconfiguration to the ML setup for adding a link) shows an example of link reconfiguration to the ML setup of a non-AP MLD, where the non-AP MLD is adding a link to its ML setup. The AP MLD has three affiliated APs - AP 1 operates in the 2.4 GHz band, AP 2 operates in the 5 GHz band, and AP 3 operates in the 6 GHz band. The non-AP MLD has three affiliated non-AP STAs - non-AP STA 1, non-AP STA 2 and non-AP STA 3. The non-AP MLD is associated with the AP MLD on two links, Link 1 on 2.4 GHz between AP1 and non-AP STA1 and Link 2 on 5 GHz between AP 2 and non-AP STA 2. The non-AP MLD initiates a link reconfiguration procedure to its ML setup and the non-AP STA 1 affiliated with the non-AP MLD sends a Link Reconfiguration Request frame to AP 1 affiliated with the AP MLD, i.e., the TA field of the Link Reconfiguration Request frame is set to the MAC address of the non-AP STA 1 and the RA field of the Link Reconfiguration Request frame is set to the MAC address of the AP 1. The Link Reconfiguration Request frame includes a Reconfiguration Multi-Link element that indicates an add link operation to setup a link between AP 3 and non-AP STA 3 and includes complete profile for the non-AP STA 3 in a Per-STA Profile subelement carried in the Reconfiguration Multi-Link element. The AP MLD then responds to the request frame, and the AP 1 affiliated with the AP MLD sends a Link Reconfiguration Response frame to the non-AP STA 1 affiliated with the non-AP MLD, i.e., the TA field of the Link Reconfiguration Response frame is set to the MAC address of the AP 1 and the RA field of the Link Reconfiguration Response frame is set to the MAC address of the non-AP STA 1, and indicates successful add link to the multi-link setup. The Link Reconfiguration Response frame indicates SUCCESS status for add link operation for Link 3 and includes a Basic Multi-Link element that provides complete profile of AP 3 in a Per-STA Profile element. After successful link reconfiguration, Link 3 is setup between AP 3 and non-AP STA 3 for the non-AP MLD.

A diagram of a computer

Description automatically generated

﻿ Figure AF-xx1—An example of link reconfiguration to the ML setup for adding a link ﻿

Figure AF-xx2 (An example of link reconfiguration to the ML setup for deleting a link and adding a link for different non-AP STAs of the non-AP MLD) shows a second example of link reconfiguration to the ML setup of a non-AP MLD, where the non-AP MLD is deleting a link and adding a link for different non-AP STAs. The AP MLD has three affiliated APs and the non-AP MLD has three affiliated non-AP STAs. The non-AP MLD is associated with the AP MLD on two links, Link 1 on 2.4 GHz between AP 1 and non-AP STA 1 and Link 2 on 5 GHz between AP 2 and non-AP STA 2. The non-AP MLD initiates a link reconfiguration procedure to its ML setup and the non-AP STA 1 affiliated with the non-AP MLD sends a Link Reconfiguration Request frame to AP 1 affiliated with the AP MLD. The Link Reconfiguration Request frame includes a Reconfiguration Multi-Link element that indicates a delete link operation for Link 2 (between AP 2 and non-AP STA 2) and an add link operation to setup a link between AP 3 and non-AP STA 3 and includes complete profile for the non-AP STA 3 in a Per-STA Profile subelement carried in the Reconfiguration Multi-Link element. The AP MLD then responds to the request frame, and the AP 1 affiliated with the AP MLD sends a Link Reconfiguration Response frame to the non-AP STA 1 affiliated with the non-AP MLD, to indicate successful delete link and add link to the multi-link setup. The Link Reconfiguration Response frame indicates SUCCESS status for delete link operation for Link 2 and add link operation for Link 3 and includes a Basic Multi-Link element that provides complete profile of AP 3 in a Per-STA Profile element. After successful link reconfiguration, Link 2 between AP 2 and non-AP STA 2 is deleted, and Link 3 is setup between AP 3 and non-AP STA 3 for the non-AP MLD.

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Figure AF-xx2—An example of link reconfiguration to the ML setup for deleting a link and adding a link for different non-AP STAs of the non-AP MLD

Figure AF-xx3 (An example of link reconfiguration to the ML setup for deleting a link and adding a link for the same non-AP STA of the non-AP MLD) shows a third example of link reconfiguration to the ML setup of a non-AP MLD, where the non-AP MLD is deleting a link and adding a link for the same non-AP STA. The AP MLD has three affiliated APs and the non-AP MLD has two affiliated non-AP STAs. The non-AP MLD is associated with the AP MLD on two links, Link 1 on 2.4 GHz between AP 1 and non-AP STA 1 and Link 2 on 5 GHz between AP 2 and non-AP STA 2. The non-AP MLD initiates a link reconfiguration procedure to its ML setup and the non-AP STA 1 affiliated with the non-AP MLD sends a Link Reconfiguration Request frame to AP 1 affiliated with the AP MLD. The Link Reconfiguration Request frame includes a Reconfiguration Multi-Link element that indicates a delete link operation for Link 2 (between AP 2 and non-AP STA 2) and an add link operation to setup a link between AP 3 and non-AP STA 2 and includes complete profile for the non-AP STA 2 in a Per-STA Profile subelement carried in the Reconfiguration Multi-Link element. The AP MLD then responds to the request frame, and the AP 1 affiliated with the AP MLD sends a Link Reconfiguration Response frame to the non-AP STA 1 affiliated with the non-AP MLD, to indicate successful delete link and add link to the multi-link setup. The Link Reconfiguration Response frame indicates SUCCESS status for delete link operation for Link 2 and add link operation for Link 3 and includes a Basic Multi-Link element that provides complete profile of AP 3 in a Per-STA Profile element. After successful link reconfiguration, Link 2 is deleted between AP 2 and non-AP STA 2, and Link 3 is setup between AP 3 and non-AP STA 2 for the non-AP MLD.

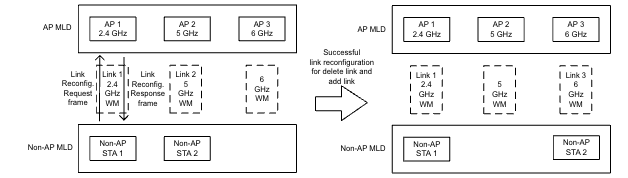


Figure AF-xx3—An example of link reconfiguration to the ML setup for deleting a link and adding a link for the same non-AP STA of the non-AP MLD