IEEE P802.11
Wireless LANs

|  |
| --- |
| **TGbe CC36 Comment Resolutions****for Subclause 35.3.5.4 – Part 2 (Single-link Setup)** |
| **Date:** 2021-08-02 |

|  |
| --- |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Insun Jang | LG Electronics | 19, Yangjae-daero 11gil, Seocho-gu, Seoul 137-130, Korea |  | Insun.jang@lge.com |
| Namyeong Kim |  | namyeong.kim@lge.com |
| Sunhee Baek |  | sunhee.baek@lge.com |
| Jinsoo Choi |  | js.choi@lge.com |
| Gaurang Naik | Qualcomm Inc. |  |  |  |
| Po-Kai Huang | Intel Corporation |  |  |  |
| Rojan Chitrakar | Panasonic |  |  |  |
| Arik Klein | Huawei |  |  |  |
| Jarkko Kneckt | Apple |  |  |  |
| Xiaofei Wang | InterDigital Inc. |  |  |  |
| Payam Torab | Facebook |  |  |  |

Abstract

This submission proposes resolutions for multiple comments on TGbe D1.0 regarding the usage and rules of Multi-Link element in the context of multi-link setup with the following CIDs (3 **CIDs**):

* 5275, 6642, 8338

Revisions:

- Rev 0: Initial version of the document.

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 1.1. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft 1.1 (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.***

**- List of CIDs**

- 5275, 6642, 8338

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 5275 | Insun Jang | 35.3.5.4 | 256.33 | Single-link setup cases between MLDs should be considered, e.g., non-AP MLD requests one link or AP MLD accepts one link only | As in the comment, single-link setup case should be considered | RevisedAgree in principle with the commenter. Some cases of single-link setup should be considered as Multi-link setup (including ML IE), e.g., Requesting one link only (on a non-AP MLD) or Accepting one link only (on an AP MLD).The revised text provides the rules for ML IE by considering the cases.**TGbe editor, please make changes as shown in doc 11-21/1222r0 tagged as CID 5275.** |
| 6642 | Pooya Monajemi | 35.3.5.4 | 256.37 | AP MLD may only accept the link on which the request was sent. Text is not clear about how this case is handled. | Clarify if in this case an ML element is not included (or if it is included with zero STA profiles). | RevisedAgree in principle with the commenter. Some cases of single-link setup should be considered as Multi-link setup (including ML IE), e.g., Requesting one link only (on a non-AP MLD) or Accepting one link only (on an AP MLD).The revised text provides the rules for ML IE by considering the cases.**TGbe editor, Please incorporate the changes as shown in 21/1222r0 under CID 5275.** |
| 8338 | Zhiqiang Han | 35.3.5.4 | 257.13 | There is a special case. non-AP STA wants to initiate a multi-link setup but the AP can only setup one link. In this case, AP will not include the Basic variant Multi-Link element. The spec shall cover this case. | Please clarify it | RevisedAgree in principle with the commenter. Some cases of single-link setup should be considered as Multi-link setup (including ML IE), e.g., Requesting one link only (on a non-AP MLD) or Accepting one link only (on an AP MLD).The revised text provides the rules for ML IE by considering the cases.**TGbe editor, Please incorporate the changes as shown in 21/1222r0 under CID 5275.** |

**Discussion:**

**Single-link setup between a non-AP MLD and an AP MLD can happen during multi-link (ML) setup as follows.**

**A non-AP MLD should determine whether it transmits the legacy Association (not including ML IE) or the ML setup (including ML IE)**

A non-AP MLD may want to request association with only one link, because:

- It is not able to operate on other links. For instance, the non-AP MLD radio may not be capable to operate in bands where other links are available or other links may have interference from other radios (BT, 5G NR, UWB,…)

- It may want to use ML functions (we’ve defined)

This way, the non-AP MLD is the best to start on one link and then can add more links through reconfiguration procedure.

An AP MLD may accept an association with one link (the link on which (Re)Association frames are exchanged), even if a non-AP MLD has requested more than one link. The AP MLD includes Basic variant ML IE in the (Re)Association Response frame even if the AP MLD has accepted only one link according to the current 802.11be D1.1, which shall be considered as an ML setup.

**Proposed spec text:**

***TGbe editor: Please modify the subclause 35.3.5.4 (Usage and Rules of Multi-Link element in the context of multi-link (re)setup) as follows:***

***TGbe editor: Please note that the baseline of this subclause 35.3.5.4 is D1.1***

35.3.5.4. Usage and Rules of Multi-Link element in the context of multi-link (re)setup

A non-AP MLD may initiate a multi-link setup with an AP MLD to set up (#5275) one or more link(s) with a subset of APs that are affiliated with the AP MLD. When a non-AP MLD initiates a multi-link setup with an AP MLD, a non-AP STA that is affiliated with the non-AP MLD shall transmit an (Re)Association Request frame on the link that it desires to use as part of the multi-link setup. An AP that is affiliated with the AP MLD and that received the (Re)Association Request frame shall transmit an (Re)Association Response frame.

The non-AP STA shall include a Basic variant Multi-Link element in the (Re)Association Request frame it transmits.

(#5275)The Basic variant Multi-Link element carried in the (Re)Association Request frame shall include the Common Info field. If a non-AP MLD requests one or more link(s) in addition to the link on which the (Re)Association Request frame is transmitted for multi-link (re)setup, the Basic variant Multi-Link element carried in the (Re)Association Request frame shall include the Link Info field. Otherwise, the Basic variant Multi-Link element carried in the (Re)Association Request frame shall not include the Link Info field.

(#5275)NOTE – A Basic variant Multi-Link element without the Link Info field carried in an (Re)Association Request frame indicates that the transmitting non-AP MLD is requesting to set up only the link on which the (Re)Association Request frame is being transmitted.

(#5275)

(#5275)

(#5275)For each link requested in addition to the link on which the (Re)Association Request frame is transmitted, the Link Info field shall contain the corresponding Per-STA Profile subelement(s). For each Per-STA Profile subelement included in the Link Info field, the Complete Profile subfield of the STA Control field shall be set to 1 (see 35.3.2.2 (Advertisement of complete or partial per-link information)).

The Link ID subfield of the STA Control field of the Per-STA Profile subelement for the corresponding non-AP STA that requests a link for multi-link setup with the AP MLD is set to the link ID of an AP MLD that is operating on that link. The link ID is obtained during discovery.

The AP shall include a Basic variant Multi-Link element in the (Re)Association Response frame that it transmits.

(#5275)The Basic variant Multi-Link element carried in the (Re)Association Response frame shall include the Common Info field. If a non-AP MLD requests one or more link(s) in addition to the link on which the (Re)Association Request frame is transmitted for multi-link (re)setup, the Basic variant Multi-Link element carried in the (Re)Association Response frame shall include the Link Info field. Otherwise, the Basic variant Multi-Link element carried in the (Re)Association Response frame shall not include the Link Info field.

(#5275)

(#5275)

(#5275)For each link requested in addition to the link on which the (Re)Association Request frame is transmitted, the Link Info field shall contain the corresponding Per-STA Profile subelement(s). For each Per-STA Profile subelement included in the Link Info field, the Complete Profile subfield of the STA Control field shall be set to 1 (see 35.3.2.2 (Advertisement of complete or partial per-link information)) and the Status Code field included in the STA Profile subfield of the Per-STA Profile subelement shall indicate SUCCESS if the link is accepted or the failure cause if the link is not accepted.