IEEE P802.11
Wireless LANs

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| PDT Hybrid EMLSR Mode |
| Date: 2021-09-21 |
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Abstract

This submission proposes the draft text for the EMLSR hybrid mode.

(The proposed change is based on TGbe Draft 1.3.)

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.***

***Discussion:***

Originally, the EMLSR mode was proposed as an enhancement mechanism of single radio non-AP MLD.

But, since the ELMSR mode is a thoughput and latency enhancement mechnsim through the fast transition of single radio on multiple links, the EMLSR mode can be also applied to one of multiple radios supported in the multi-radio non-AP MLD.

The below is one example.

* When the non-AP MLD establishes the MLO setup on 3 links (2.4GHz, 5GHz, and 6 GHz) through 2 main radios and 1 auxiarilly radio, one main radio operates on 2.4GHz link as a STR mode, another main radio can operate on 5GHz and 6 GHz links as an EMLSR mode.



In this contribution, when the EMLSR mode is applied to the multi-radio non-AP MLD, this operation is called as the hybrid EMLSR mode. Through the hybrid EMLSR mode, we can achieve higher throughput and lower latency gain.

***Proposed draft text:***

9.4.2.295b.2 Basic variant Multi-Link element

***TGbe editor: Insert the Hybrid EMLSR Support subfield to Table 9-788el (EML Capabilities subfield format).***

***TGbe editor: Change the following paragraphs of the subclause as follows:***

The Transition Timeout subfield indicates the timeout value for EML Operating Mode Notification frame exchange in EMLMR mode (see 35.3.17 (Enhanced multi-link multi-radio operation)).

When the Transition Timeout subfield is included in a frame sent by an AP affiliated with an AP MLD, the Transition Timeout subfield is set to 0 for 0 TU, set to 1 for 1 TU, set to 2 for 2 TUs, set to 3 for 4 TUs, set to 4 for 8 TUs, set to 5 for 16 TUs, set to 6 for 32 TUs, set to 7 for 64 TUs, set to 8 for 128 TUs, and the val- ues 9 and 15 are reserved. When the Transition Timeout subfield is included in a frame sent by a non-AP STA affiliated with a non-AP MLD, the Transition Timeout subfield is set to 0.

The Hybrid EMLSR Support subfield indicates support of the hybrid EMLSR operation for an MLD. The Hybrid EMLSR Support subfield is set to 1 if the MLD supports hybrid ELMSR operation; otherwise it is set to 0.

The EMLMR Rx NSS subfield indicates the maximum receive *Nss* that is supported by the non-AP MLD in the EMLMR mode.

***TGbe editor: Change the subclause 35.3.15.1 as follows:***

### 35.3.15.1 Multi-link device capability signaling

An AP MLD shall set the Maximum Number Of Simultaneous Links subfield in the Basic Multi-Link element to the number of affiliated APs minus 1, in which the number of affiliated APs in the AP MLD shall be greater than 1.

If dot11EHTBaseLineFeaturesImplementedOnly is equal to true, an NSTR mobile AP MLD shall set the Maximum Number of Simultaneous Links subfield of the Basic Multi-Link element carried in transmitted Management frames to 1.

A single radio non-AP MLD shall set the Maximum Number Of Simultaneous Links subfield in the Basic Multi-Link element carried in transmitted Management frames to 0.

~~An non-AP MLD with dot11EHTEMLSROptionImplemented equal to true shall set the Maximum Number Of Simultaneous Links subfield in the Basic Multi-Link element to 0.~~

A multi-radio non-AP MLD shall set the Maximum Number Of Simultaneous Links subfield in the Basic Multi-Link element carried in transmitted Management frames to a value equal to or larger than 1.

***TGbe editor: Change the subclause 35.3.8 as follows:***

35.3.8 Enhanced multi-link single radio operation

A non-AP MLD may operate in the EMLSR mode on a set of the enabled links between the non-AP MLD and its associated AP MLD.

An MLD with dot11EHTEMLSROptionImplemented equal to true shall set the EML Capabilities Present subfield to 1 and shall set the EMLSR Support subfield of Basic variant Multi-Link element (9.4.2.295b.2 (Basic variant Multi-Link element)) to 1; otherwise, the MLD shall set the EMLSR Support subfield to 0.

An MLD with dot11EHTHybridEMLSROptionImplemented equal to true shall set the Hybrid EMLSR Support subfield of Basic variant Multi-Link element (9.4.2.295b.2 (Basic variant Multi-Link element)) to 1; otherwise, the MLD shall set the Hybrid EMLSR Support subfield to 0. If dot11EHTHybridEMLSROptionImplemented equal to true, an MLD shall set dot11EHTEMLSROptionImplemented to true. A single radio non-AP MLD shall set the Hybrid EMLSR Support subfield of Basic variant Multi-Link element (9.4.2.295b.2 (Basic variant Multi-Link element)) to 0.

When a non-AP MLD with dot11EHTHybridEMLSROptionImplemented equal to true operates in the EMLSR mode with its associated AP MLD that sent the Basic variant Multi-Link element in which the Hybrid EMLSR Support subfield set to 1, then the non-AP MLD and the AP MLD may exchange frames on a link that is not in the EMLSR links but is in a STR link pair with each of the EMLSR links, according to 35.3.15.2 (Simultaneous transmit and receive operation). Otherwise, the AP MLD and the non-AP MLD may exchange frames only on the EMLSR links according to this subclause.

***TGbe editor: Change the subclause C.3 as follows:***

**C.3 MIB Detail**

Dot11EHTStationConfigEntry ::=

 SEQUENCE {

 dot11EHTPPEThresholdsRequired TruthValue,

 dot11TIDtoLinkMappingActivated TruthValue,

 dot11EHTEMLSROptionImplemented TruthValue,

 dot11EHTHybridEMLSROptionImplemented TruthValue

 }

dot11EHTEMLSROptionImplemented OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

This attribute, when true, indicates that the MLD implementation is capable of supporting the EMLSR operation. The capability is disabled otherwise."

 ::= { dot11EHTStationConfigEntry 3}

dot11EHTHybridEMLSROptionImplemented OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

This attribute, when true, indicates that the MLD implementation is capable of supporting the hybrid EMLMR operation. The capability is disabled otherwise."

 ::= { dot11EHTStationConfigEntry 4}