IEEE P802.11
Wireless LANs

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| CR for 9.4.2.295b.2: MLD Capabilities field |
| Date: 2021-07-06 |
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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.

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| **CID** | **Commenter** | **Clause**  | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 4014 | Abhishek Patil | 9.4.2.295b.2 | 131.62 | The statement on P132L62 is incorrect. Clause 35.3.14.4 does not cover the case for TID-to-mapping Support subfield and SRS Support subfields. | Delete this statement and add reference to 35.3.14.4 in Table 9-322ao where Maximum Number Of Simultaneous Links subfield and Frequency Separation for STR subfield is described. | RevisedAgree with the commenter. The references are removed, and the frames that carry MLD Capabilities subfield are clarified.Similar changes for Link Info and BSS Parameters Change Count subfield.MLD MAC Address subfield will always present base on Motion in doc 21/569r2. So the condition for presence of MLD MAC address is not needed any more.TGbe editor to make the changes shown in doc 21/1206r4 with tag (#4014) |
| 4365 | Arik Klein | 9.4.2.295b.2 | 132.25 | The current definition of "Maximum Number Of Simultaneous Links" subfield seems not accurate since the term "simultaneous transmission or reception of frames" refers to \*pairs of\* affiliated STAs rahter then to the same affiliated STA. Please rephrase the definition. | consider revising the sentence as follows:" Indicates the maximum number of STAs affiliated with the MLD that support simultaneous transmission or reception of frames on any pair of affiliated STAs" | RevisedThe sentence is modified accordingly.TGbe editor to make the changes shown in doc 21/1206r4 with tag (#4365) |
| 5746 | Laurent Cariou | 9.4.2.295b.2 | 132.25 | Maximum Number Of Simultaneous Links - should we say that for an AP MLD, this is equal to the number of links of the AP MLD, or make this reserved? | as in comment | RevisedA sentence is added to clarify that AP MLD will set the Maximum Number Of Simultaneous Links subfield to the number of affiliated APs minus 1.TGbe editor to make the changes shown in doc 21/1206r4 with tag (#5746) |
| 6599 | Po-Kai Huang | 9.4.2.295b.2 | 132.25 | "Maximum Number OfSimultaneous Links" field needs to be reserved for AP MLD which sets dot11SoftAPMLDImplemented to false, since AP MLD which sets dot11SoftAPMLDImplemented to false is always STR | Add description that Maximum Number OfSimultaneous Links field is reserved for AP MLD. | RejectedSoft AP MLD will set this field to 1. If this field is reserved for normal AP MLD and used for other purpose, when a normal AP MLD set this field to a non-zero value in the future, the STA MLD may regard this normal AP MLD as a soft AP MLD.For simplicity, suggest that all AP MLDs will set Maximum Number OfSimultaneous Links subfield to the number of affiliated APs minus 1. |
| 6388 | Muhammad Kumail Haider | 9.4.2.295b.2 | 133.14 | This paragraph is confusing to read. Please rephrase as: "If the value of the Maximum Number Of Simultaneous Links subfield in the MLD Capabilities field is greater than 0, the NSTR Link Pair Present subfield in a STA Control field indicates if the link corresponding to that STA is present in atleast one NSTR link pair of the MLD. It is set to 1 if there is at least one such link pair; otherwise it is set to 0." | as in comment | Rejected.The setting of Maximum Number Of Simultaneous Links subfield is not related to NSTR Link Pair Present subfield in STA Control field. |
| 4266 | Alfred Asterjadhi | 9.4.2.295b.2 | 132.36 | It is useful for an AP to know whether the STA is capable of generating SRS Control. Change Set to 0 to Set to 1 to indicate that the non-AP MLD to which the STA is affiliated is capable of generating frames with SRS Control fields. | As in comment. | RevisedAgree with the commenter, and add the sentence accordingly.TGbe editor to make the changes shown in doc 21/1206r4 with tag (#4266) |
| 8284 | Zhiqiang Han | 9.4.2.295b.2 | 132.31 | The transmission of a frame that carries an SRS Control subfield is mandotory or optional?Please clarify it | as in comment. | RevisedAdd the sentence to clarify that the non-AP MLD will indicate the capability of generating frames with SRS Control subfield through SRS Support subfield.TGbe editor to make the changes shown in doc 21/1206r4 with tag (#8284) |
| 7040 | Sigurd Schelstraete | 9.4.2.295b.2 | 132.52 | Unclear definition: "Set to a nonzero value to indicate the STR frequency gap, in units of 80 MHz, minus 80 MHz." | Provided clearer mapping of value to frequency separation | RevisedChanged the sentence to an equation style to make it clearer.TGbe editor to make the changes shown in doc 21/1206r4 with tag (#7040) |
| 7582 | Tomoko Adachi | 9.4.2.295b.2 | 132.50 | "Set to 0 to indicate no frequency separation information is provided." From this description, it is not clear how a receiver should interpret this field when set to 0. From pp.ll 276.21, the non-AP MLD sets this subfield to 0 when it intends not to provide such information. If the MLD has an NSTR link pair but set this field to 0, the recipient should interpret it as N/A or unknown at the transmitter. But how is it set when all the links in the MLD are STR? Is it also set to 0? In such case, a receipient should interpret as no need to worry about the frequency separation. The former and the latter should be differentiated. | As in comment. | RejectedThis is just a side information that is reported by a non-AP MLD to AP MLD for the purpose of channel selection when the AP MLD intends to setup a new BSS or do channel switch. The AP MLD always determines the STR/NSTR capability of a link pair of non-AP MLD from the indication through NSTR Indication Bitmap field in Multi-Link element. |
| 8283 | Zhiqiang Han | 9.4.2.295b.2 | 132.08 | There are five bits to indicate the minimum frequency gap in units of 80MHz, the maximum frequency gap is 80\*32=2560MHz, Do we need to indicate such a big gap？ | How about changing the units from 80MHz to 40MHz? or change 5bits to 4bits? | Rejected.The NSTR link pair exists on 5GHz and/or 6GHz unlicensed bands. The lowest frequency in 5 GHz band is 5150 MHz, and the highest frequency is 7125 MHz. So the value of 2560 is a good choice to cover 5 GHz and 6 GHz bands. |
| 8285 | Zhiqiang Han | 9.4.2.295b.2 | 132.54 | If the minumum frequence gap is 80MHz, the value shall be set to 0, but 0 indicates no frequency separation information is provided. | as in comment. | Rejected.The value 2 is used to indicate the minimum frequency gap of 80 MHz based on the design, so the issue doesn’t exist. |

***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).***

1. **Proposed spec text**

***TGbe editor: Please change below paragraphs in subclauses 9.4.2.295b.2 (Basic variant Multi-Link element) as follows:***

 The Link ID Info subfield, and the BSS Parameters Change Count subfield are present in the Common Info field of the Basic variant Multi-Link element carried in a Beacon, Probe Response that is ML probe response and (Re) Association Response frames. The Link ID Info subfield, and the BSS Parameters Change Count subfield are not present in the Common Info field of the Basic variant Multi-Link element carried in an Authentication frame. (#4014)

 The MLD Capabilities subfield is present in the Common Info field of the Basic variant Multi-Link element carried in a Beacon, Probe Response, (Re) Association Request and (Re) Association Response frames. The MLD Capabilities subfield is not present in the Common Info field of the Basic variant Multi-Link element carried in an Authentication frame. (#4014)

The format of the MLD Capabilities subfield is defined in [Figure 9-788em (MLD Capabilities sub-](#bookmark103) [field format)](#bookmark103).

B0 B3 B4 B5 B6 B7 B11 B12 B15

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Maximum Number Of Simultaneous Links | SRS Support | TID-To-Link Mapping Negotiation Supported | Frequency Separation For STR | Reserved |

Bits: 4 1 2 5 4

**Figure 9-788em—MLD Capabilities subfield format**

The subfields of the MLD Capabilities subfield are defined in [Table 9-322ao (Subfields of the MLD](#bookmark104) [Capabilities field)](#bookmark104).

**Table 9-322ao—Subfields of the MLD Capabilities field**

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| Maximum Number Of Simultaneous Links | Indicates the maximum number of STAs affiliated with the MLD that support simultaneous transmission or reception of frames on the respective links.(#4365) | Set to the maximum number of affiliated STAs in the non-AP MLD that support simultaneous trans- mission or reception of frames minus 1.For an AP MLD, set to the number of affiliated APs minus 1.(#5746)(See 35.3.15.4 (Multi-link device capability signaling)) (#4014) |
| SRS Support | Indicates support for the reception of a frame that carries an SRS Control sub- field. | For an EHT AP:Set to 1 to indicate that an AP MLD, with which the AP is affiliated, is capable of receiving a frame with an SRS Control sub- field. Set to 0 otherwise.For a non-AP EHT STA:Set to 1 to indicate that a non-AP MLD, with which the non-AP EHT STA is affiliated, is capable of generating frames with an SRS Control sub field. Set to 0 otherwise. (#4266, 8284)(See 35.3.15.5 (PPDU end time alignment)) (#4014) |
| TID-To-Link Mapping Negotiation Sup ported | Indicates support for TID-to-link mapping negotiation. | Set to 0 if dot11TIDtoLinkMappingActivated is false.Set to 1 if dot11TIDtoLinkMappingActivated is true and the MLD supports the mapping of each TID to the same or different link set.Set to 2 if dot11TIDtoLinkMappingActivated is true and the MLD supports the mapping of all TIDs to the same link set.The value 3 is reserved.(See 35.3.6.1.3 (Negotiation of TID-to-link mapping)) |
| Frequency Separation For STR | Indicates the minimum frequency gap between any two links that is recom- mended by the non-AP MLD for STR operation. The frequency gap is speci- fied as the difference between the nearest frequency edges of the two links. | For a non-AP MLD:Set to 0 to indicate that no frequency separation information is provided.Set to a nonzero value n to indicate that the STR frequency gap is (n-1)80 MHz. (#7040) For an AP MLD: Reserved.(See 35.3.15.4 (Multi-link device capability signaling)) (#4014) |

***End of change***