IEEE P802.11
Wireless LANs

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| MLO – 35.3.4.1 |
| Date: 2020-07-0 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Laurent Cariou |  |  |  | laurent.cariou@intel.com |

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution** | **Ad-hoc Notes** |
| 5306 | Jarkko Kneckt | 35.3.4 | 251.12 | An asociated non-AP MLD should be able to scan AP parameters by using robust information query frame and to get a robust unicast response or integrity protected broadcast response | Please add a mechanism for associated STAs to perform secure discovery |   | Volunteer: Gaurang Naik |
| 6202 | Michael Montemurro | 35.3.4 | 251.12 | Besides active scanning, STA discovery procedures make use of other protocols such as ANQP. Presumably there would be a few requirements, such as the HESSID and the ANQP information should be the same across all APs affiliated with an AP MLD. | Add a new sub-clause to mention ANQP discovery procedures.The commenter is willing to collaborate on a contribution that addresses this comment. |   | Volunteer: Gaurang Naik |
| 6398 | Muhammad Kumail Haider | 35.3.4 | 251.12 | Multiple occurrences of phrase "AP affiliated to AP MLD"; the group has converged on the phrase "affiliated with" in context of MLD and this subclause should be revised to change all occurrences of "affiliated to" to "affiliated with" | Change "affiliated to" to "affiliated with" for all occurrences |  Revised – agree with the commenter. Modify all occurances of “affiliated to” to “affiliated with”. Apply the changes marked as #6398 in this document | Volunteer: Gaurang Naik |
| 6631 | Po-Kai Huang | 35.3.4 | 251.12 | It is not clear how the client interprets the SSID from discovery AP MLD. Clearly, non-AP MLD has to see one SSID from AP MLD. Otherwise, the interpretation about mobility has confusions. | Specify that all APs in the AP MLD has the same SSID. |  Revised – agree with the commenter. D1.0 already has language that specify that all APs of an AP MLD have the same SSID, as the SSID field is not present in the STA profile of the multilink element when transmitted by the AP, and is inherited from the transmitting AP. We can add a note here to mention in this context that the short SSID field in the RNR is equal for all reported APs that are part of the same AP MLD. Apply the changes marked as #6631 in this document. | Volunteer: Gaurang Naik |
| 5970 | Liwen Chu | 35.3.4.1 | 251.14 | The AP affiliated to AP MLD should be one of 1) reporting AP without multiple BSSID support, 2) reporting AP with multiple BSSID support and with transmitted BSSID, 3) AP with multiple BSSID support, with non-transmitted BSSID and in same channel with trporting AP, 4) AP in another link. The text in the paragraph only describe three cases. | As in comment |  Revised – agree with the 4 categories. Category 1 and 2 are actually captured in the first paragraph as the rules are identical. The second paragraph however has a typo as it should be if the AP corresponds to a nontransmitted BSSID. Apply the changes marked as CID5970 in this document | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5971 | Liwen Chu | 35.3.4.1 | 251.14 | The discription is not clear. When multiple APs are related to one case, the APs should be described as AP1, AP2 etc. When multiple AP MLDs are related in one case, the AP MLDs should be decribed as AP MLD 1, AP MLD 2.... | As in comment |  Revised – add in parenthesis an AP and AP MLD numbering to ease the understanding. Apply the changes marked as #5971 in this document | Volunteers: Xiaofei Wang, Gaurang Naik |
| 4363 | Arik Klein | 35.3.4.1 | 251.16 | Use the term "affiliated with" in the following sentence:"If an AP is \*affiliated to\* an AP MLD and does not correspond to a nontransmitted BSSID..." | Revise the sentence as follows: "If an AP is \*affiliated with\* an AP MLD and does not correspond to a nontransmitted BSSID..." |  Revised – agree with the commenter. Apply the changes marked as #4363 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5251 | Insun Jang | 35.3.4.1 | 251.16 | Should be changed from "does not correspond to a nontransmitted BSSID" to "corresponds to a nontransmitted BSSID" for considering the case | As in the comment |  Revised – agree with the commenter. Apply the changes marked as #5251 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 6193 | Michael Montemurro | 35.3.4.1 | 251.16 | "to" should be a "with | Change "affiliated to" to "affiliated with" at 251.16, 251.21, 251.25, 251.31 | Revised – agree with the commenter. Apply the changes marked as #6193 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 6259 | Ming Gan | 35.3.4.1 | 251.17 | Change "affliated to" to "affiliated with" | as in the comment |  Revised – agree with the commenter. Apply the changes marked as #6259 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 4039 | Abhishek Patil | 35.3.4.1 | 251.25 | This paragraph specifies the rules for the case of where the affiliated AP corresponds to nonTxBSID. The term 'does not' is a typo | Delete 'does not' |  Revised – agree with the commenter. Apply the changes marked as #4039 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 4364 | Arik Klein | 35.3.4.1 | 251.25 | Use the term "affiliated with" in the following sentence: "If an AP is \*affiliated to\* an AP MLD and does not correspond to a nontransmitted BSSID, then..." | Revise the sentence as follows: "If an AP is \*affiliated with\* an AP MLD and does not correspond to a nontransmitted BSSID, then..." |  Revised – agree with the commenter. Apply the changes marked as #4364 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5049 | Gaurang Naik | 35.3.4.1 | 251.25 | The paragraph describes the behavior of APs for the nontransmitted BSSID case. | Replace "and does not correpond to a nontransmitted BSSID" to "and corresponds to a nontransmitted BSSID" |  Revised – agree with the commenter. Apply the changes marked as #5049 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5768 | Laurent Cariou | 35.3.4.1 | 251.25 | Typo: this paragraph should start with : If an AP is affiliated to an AP MLD and corresponds to a nontransmitted BSSID | as in comment |  Revised – agree with the commenter. Apply the changes marked as #5768 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5908 | Li-Hsiang Sun | 35.3.4.1 | 251.25 | "If an AP is affiliated to an AP MLD and does not correspond to a nontransmitted BSSID" | remove "does not" |  Revised – agree with the commenter. Apply the changes marked as #5908 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5909 | Li-Hsiang Sun | 35.3.4.1 | 251.25 | "If an AP is affiliated to an AP MLD and does not correspond to a nontransmitted BSSID, then the Beacon and Probe Response frames transmitted by the AP corresponding to the transmitted BSSID of the same multiple BSSID set as the AP shall include a TBTT Information field ..."There are 2 "the AP" in the same sentence very difficult to read | Change to "If an first AP ....as the first AP shall include a TBTT ..." |  Revised – agree with the commenter. Include an AP and AP MLD numbering in parenthesis to ease the understanding. Apply the changes marked as #5909 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 6098 | Marcos Martinez Vazquez | 35.3.4.1 | 251.25 | Duplicated paragraph? | Paragraph from lines 17-23 and the one from 25-31 seems to say the same thing |  Rejected – the 2 paragraphs are for the 2 cases. 1 – where the AP is not part of a Multiple BSSID set or is part of a multiple BSSID set and is a transmitted BSSID. 2 – where the AP is a nontransmitted BSSID.  | Volunteers: Xiaofei Wang, Gaurang Naik |
| 6260 | Ming Gan | 35.3.4.1 | 251.25 | Change "affliated to" to "affiliated with" | as in the comment |  Revised – agree with the commenter. Apply the changes marked as #6260 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 6261 | Ming Gan | 35.3.4.1 | 251.25 | What is the same AP MLD at the end of this paragraph, is that the AP MLD mentioned at the beginning of this paragraph? If this is case, please change "does not correspond" to "corresponds". Or please rephrase this paragraph. | as in the comment |  Revised – agree with the commenter. Apply the changes marked as #6261 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 8030 | Yuchen Guo | 35.3.4.1 | 251.25 | This paragraph should be discussing the nontransmitted BSSID case, however, the first sentence is saying that the AP does not corresponding to a nontransmitted BSSID | change "does not correspond to" to "corresponds to" |  Revised – agree with the commenter. Apply the changes marked as #8030 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 4252 | Alfred Asterjadhi | 35.3.4.1 | 251.33 | This sentence is very long and hence difficult to read. Consider splitting or using itemization | As in comment. |  Revised – agree with the commenter. The conditions are rather complicated, but an itemization of the conditions will help the understanding. Apply the changes marked as #4252 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5324 | Jarkko Kneckt | 35.3.4.1 | 251.33 | The RNR element should signal whether a reported AP sends beacon on high transmission rates, lets say higher than 12 Mbit/s or 24 mbit/s. This helps STA to optimize scanning of the AP and helps to determine the reported BSS range. | Please add a bit to the RNR to signal whether the reported AP sends Beacons in transmission rate that is smaller or equal to 24 Mbit/s. |   | Volunteers: Xiaofei Wang, Gaurang Naik |
| 6194 | Michael Montemurro | 35.3.4.1 | 251.33 | Presumably when an AP is part of an AP MLD, it is really affiliated with the AP MLD. | Change "AP is part of an AP MLD" to "AP is affiliated with an AP MLD" |  Revised – agree with the commenter. Apply the changes marked as #6194 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 4040 | Abhishek Patil | 35.3.4.1 | 251.34 | This is a really long sentence. Consider splitting it into smaller sentences or bullets to make it easy to read. | As in comment |   Revised – agree with the commenter. The conditions are rather complicated, but an itemization of the conditions will help the understanding. Apply the changes marked as #4040 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 5603 | John Wullert | 35.3.4.1 | 251.47 | The passive voice of this requirement, which is written from the point of view of the reported AP, is confusing. Given that the requirement actually applies to the reporting AP, it would be clearer to write the requirement from that point of view. | Revise requirement to indicate the behavior of the active device, the reporting AP, e.g., If a reporting AP affiliated with an MLD transmits a Reduced Neighbor Report element with the MLD Parameters subfield present in the TBTT Information field for another AP affiliated with the same AP MLD, the reporting AP shall set the MLD ID, the link ID, and the BSS Parameters Change Count subfields as described in 9.4.2.170.2 (Neighbor AP Information field)." |  Revised – agree with the commenter. Apply the changes marked as #5603 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 8231 | Yuxin LU | 35.3.4.1 AP behavior | 251.52 | Change "to which AP MLD a reported AP is affiliated to" to "to which AP MLD a reported AP is affiliated" | As in comment |  Revised – agree with the commenter. Modify it with: with which AP MLD a reported AP is affiliated. Apply the changes marked as #8231 in this document. | Volunteers: Xiaofei Wang, Gaurang Naik |
| 4041 | Abhishek Patil | 35.3.4.1 | 251.54 | Each AP of an AP MLD may operate at different transmit power. This may be by choice or due to regulator requirements. The standard must provide sufficient information for a non-AP MLD to determine if it can close the DL with all the APs of the AP MLD before it initiates an ML setup with the AP MLD. | Document 11-20/508 discusses the issue and doc 11-21/386 proposes a solution. Incorporate the proposed changes in doc 11-21/386 |   | Volunteers: Xiaofei Wang, Gaurang Naik, ​Abhishek Patil |

1. **Introduction**
2. **Proposed spec text**

**35.3.4 Discovery of an AP MLD**

**35.3.4.1 AP behavior (#6398, #4363, #6193, #6259, #4364, #6260: affiliated with instead of affiliated to) (#5971, #5909, #6261: AP numbering)**

(#2854)(#2299)(#1866)(#2968)(#2512)(#1865)If an AP is affiliated with an AP MLD and does not correspond to a nontransmitted BSSID, then the Beacon and Probe Response frames transmitted by the AP shall include a TBTT Information field in a Reduced Neighbor Report element with the Neighbor AP TBTT Offset subfield, the BSSID subfield, the Short-SSID subfield, the BSS Parameters subfield, the 20 MHz PSD subfield(#1186), and the MLD Parameters subfield, for each of the other APs affiliated with the same AP MLD.

If an AP (AP1) is affiliated with an AP MLD (AP MLD1) and corresponds (#5970, #5251, #4039, #5049, #5768, #5908, #6261, #8030) to a nontransmitted BSSID, then the Beacon and Probe Response frames transmitted by the AP (AP2) corresponding to the transmitted BSSID of the same multiple BSSID set as the AP (AP1) shall include a TBTT Information field in a Reduced Neighbor Report elementwith the Neighbor AP TBTT Offset subfield, the BSSID subfield, the Short-SSID subfield, the BSSParameters subfield, the 20 MHz PSD subfield(#1186), and the MLD Parameters subfield, for each of the other APs affiliated with the same AP MLD (AP MLD1)(#1671)(#1418)(#1039)(#1780)(#1781)(#2298).

(#6631) NOTE— As all APs affiliated with the same AP MLD have the same SSID, the Short-SSID subfield is the same for all reported APs affiliated with the same AP MLD.

(#4252, #4040) (#2589)(#2867)If all following conditions are true:

* a reporting AP is (#6194) affiliated with an AP MLD (AP MLD1) and is in the same co-located AP set as APs affiliated with another AP MLD (AP MLD2)
* the other AP MLD (AP MLD2) has no affiliated APs operating on the same channel as the reporting AP
* one AP affiliated with the other AP MLD (AP MLD2) is in the same multiple BSSID set as an AP affiliated with the AP MLD (AP MLD1) of the reporting AP

then each AP of the other AP MLD (AP MLD2) shall be reported in a TBTT Information field with the Neighbor AP TBTT Offset subfield, the BSSID subfield, the Short-BSSID subfield, the BSS Parameters subfield, the 20 MHz PSD subfield, and the MLD Parameters subfield in the Reduced Neighbor Report element that is included in the Beacon frames and broadcast Probe Response frames transmitted by the reporting AP, unless the APs of the other AP MLD (AP MLD2) are already reported in Beacon frames and broadcast Probe Response frames transmitted by an AP in the same co-located AP set as the reporting AP and operating on the same channel as the reporting AP.

(#2295)(#2972)(#3361)(#1041)(#1923)(#1973)(#1924)(#1925)(#1068) (#5603) If a reporting AP reports an AP affiliated with an MLD in a Reduced Neighbor Report element with the MLD Parameters subfield present in the TBTT Information field for that AP, then the reporting AP shall set the MLD ID, the link ID, and the BSS Parameters Change Count subfields as described in 9.4.2.170.2 (Neighbor AP Information field).

(#2820) (#8231) NOTE—The MLD ID subfield in the Reduced Neighbor Report element is used to determine with which AP MLD a reported AP is affiliated, especially when multiple AP MLDs are reported in the same frame.