IEEE P802.11
Wireless LANs

|  |
| --- |
| CC36 Resolution for CIDs related to Multi-Link Advertisement (Part 2) |
| Date: August 1, 2021 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc |  |  | appatil@qti.qualcomm.com |
| Gaurang Naik |  |  |  |
| George Cherian |  |  |  |
| Alfred Asterjadhi |  |  |  |
| Duncan Ho |  |  |  |
| Yanjun Sun |  |  |  |
| Abdel Karim |  |  |  |
| Tomo Adachi | Toshiba |  |  |  |
| Rubayet Shafin | Samsung |  |  |  |
| Rojan Chitrakar | Panasonic |  |  |  |
| Insun | LGE |  |  |  |
| Namyeong |  |  |  |
| Arik | Huawei |  |  |  |
| Po-Kai | Intel |  |  |  |
| Thomas | Broadcom |  |  |  |

 Abstract

This submission proposes resolutions for the following 34 CIDs received for TGbe CC36:

4016, 6000, 6072, 4102, 6013, 7701, 6605, 6021, 7041, 6016, 6017, 6019, 6018, 8329, 5904, 6571, 6873, 6874, 6875, 7848, 6572, 4248, 7719, 7720, 6877, 6536, 5968, 5898, 8226, 5048, 4037, 7812, 8331, 5907

***TGbe editor: The baseline for this document is 11be D1.3 with exceptions as listed in-line.***

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Updated based on offline feedback from several members (added as co-authors)
* Rev 2: additional updates based on offline feedback
* Rev 3: Editorial fixes based on additional feedback from Arik
* Rev 4: Live changes made when the doc was presented in TGbe MAC call 8/19/21
* Rev 5: Live changes made when the doc was presented in TGbe MAC call 8/23/21
* Rev 6: Updated resolution for CID 7812 based on offline discussion with Thomas and Po-Kai
	+ Changes highlighted in blue
* Rev 7: Updated resolution for CID 7812 to align with recent updates to baseline spec (REVme) [[11-21/1664](https://mentor.ieee.org/802.11/dcn/21/11-21-1664-01-000m-resolution-for-cid-4.docx)]
	+ Changes highlighted in green
* Rev 8: Updated to align with D1.3

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 4016 | Abhishek Patil | 9.4.2.295b.2 | 0.00 | The STA Info field needs to carry MaxBSSID Indicator field when the reported AP belongs to a multiple BSSID set. This will help a non-AP MLD determine the size of the MBSSID set on the other link and make decisions on intra-BSS PPDU/NAV classification. | As in comment | **Revised**Agree with the commenter. A reporting AP needs to provide information on whether the reported AP belongs to a multiple BSSID set and if so, what is the size of the set and identify the transmitted BSSID. Such information is required by the non-AP MLD to identify the frames (e.g., Beacon, Probe Response, Control) transmitted by the transmitted BSSID. The information also helps perform operations such as classifying a PPDU as intra-BSS when the PPDU originates from or is directed towards any AP in the set. The proposed change adds an optional Multiple BSSID Info field to STA Info field. This field consisting of MaxBSSID Indicator and BSSID Index subfields. The field is present when the reported AP is a member of a multiple BSSID set.**TGbe editor, please implement changes as shown in doc 11-21/1176r8 tagged 4016** |
| 6000 | Liwen Chu | 35.3.18 | 284.40 | The association of MLD in one link can't give all the information of another link where the related AP in another link is non-transmitted BSSID. | Fix the issue by including the additional information in the MLD association frame. | **Revised**Agree with the commenter. A reporting AP needs to provide information on whether the reported AP belongs to a multiple BSSID set and if so, what is the size of the set and identify the transmitted BSSID. Such information is required by the non-AP MLD to identify the frames (e.g., Beacon, Probe Response, Control) transmitted by the transmitted BSSID. The information also helps perform operations such as classifying a PPDU as intra-BSS when the PPDU originates from or is directed towards any AP in the set. The proposed change adds an optional Multiple BSSID Info field to STA Info field. This field consisting of MaxBSSID Indicator and BSSID Index subfields. The field is present when the reported AP is a member of a multiple BSSID set.**TGbe editor, please implement changes as shown in doc 11-21/1176r8 tagged 4016** |
| 6072 | Liwen Chu | 35.3.18 | 284.40 | When a non-AP MLD has non-transmitted BSSID in a reported link, the association can't provide the full information of multiple BSSID in the reported link. Accordingly the operation of intra-BSS/inter-BSS NAV, OBSS PD, control frame with transmitted BSSID as TA for STAs associated with multiple APs can't work correctly. | Address the issue raised by the comment. | **Revised**Agree with the commenter. A reporting AP needs to provide information on whether the reported AP belongs to a multiple BSSID set and if so, what is the size of the set and identify the transmitted BSSID. Such information is required by the non-AP MLD to identify the frames (e.g., Beacon, Probe Response, Control) transmitted by the transmitted BSSID. The information also helps perform operations such as classifying a PPDU as intra-BSS when the PPDU originates from or is directed towards any AP in the set. The proposed change adds an optional Multiple BSSID Info field to STA Info field. This field consisting of MaxBSSID Indicator and BSSID Index subfields. The field is present when the reported AP is a member of a multiple BSSID set.**TGbe editor, please implement changes as shown in doc 11-21/1176r8 tagged 4016** |

**9.4.2.312.2 Basic variant Multi-Link element**

***TGbe editor: Please update the following Figure 9-788eo as shown below:***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B3 | B4 | B5 | B6 | B7 | B8 | B9 | B10 | B10 B15 |
|  | Link ID | Complete Profile | MAC Address Present | Beacon Interval Present | DTIM Info Present | NSTR Link Pair Present | NSTR Bitmap Size | Multiple BSSID Info Present | Reserved |
| Bits: | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 |

**Figure 9-1002k—STA Control field format**[4016]

***TGbe editor: Please add the following paragraph after the paragraph starting “If the Complete Profile subfield is equal to 1 and the NSTR Link Pair Present subfield …” as shown below:***

[4016]The Multiple BSSID Info Present subfield indicates the presence of the Multiple BSSID Info subfield in the STA Info field. A non-AP STA sets the Multiple BSSID Info Present subfield to 0 in a transmitted Basic variant Multi-Link element. An AP sets the Multiple BSSID Info subfield to 1 if the Per-STA Profile subelement of the Basic variant Multi-Link element carries a complete profile for a reported AP that is a member of a multiple BSSID set. Otherwise, the AP sets the Multiple BSSID Info subfield to 0.

***TGbe editor: Please update the following Figure as shown below:***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | STA Info Length | STA MAC Address | Beacon Interval | DTIM Info | NSTR Indication Bitmap | Multiple BSSID Info |
| Octets: | 1 | 0 or 6 | 0 or 2 | 0 or 2 | 0 or 1 or 2 | 0 or 2 |

**Figure 9-1002l: STA Info field format**[4016]

***TGbe editor: Please add the following Figure, paragraphs and NOTEs before the paragraph starting: “The contents of the STA Profile field …” as shown below:***

[4016]The format of the Multiple BSSID Info subfield of the STA Info field is defined in Figure 9-xxx2 (Multiple BSSID Info subfield format).

BSSID Index

MaxBSSID Indicator

Octets: 1 1

**Figure 9-xxx2—Multiple BSSID Info subfield format**

[4016]The MaxBSSID Indicator subfield is defined in 9.4.2.45 (Multiple BSSID element) and carries the same value as the MaxBSSID Indicator field of the Multiple BSSID element carried in the Beacon frame transmitted by the AP corresponding to the transmitted BSSID in the same Multiple BSSID set as the reported AP.

[4016]NOTE – A non-AP MLD can determine the size of the multiple BSSID set, to which the reported AP belongs to, based on the value carried in the MaxBSSID Indicator subfield. A STA affiliated with the non-AP MLD when associated with a reported AP that is a member of the multiple BSSID set can use this information for classifying PPDUs as intra-BSS or inter-BSS and perform operations such as setting intra-BSS and basic NAVs, intra-PPDU power-save and spatial reuse.

[4016]The BSSID Index subfield indicates the BSSID index of the reported AP when the reported AP corresponds to a nontransmitted BSSID as defined in 9.4.2.73 (Multiple BSSID-Index element). Otherwise, the BSSID Index subfield set to 0.

[4016]NOTE – A non-AP MLD can identify the MAC address of the AP corresponding to the transmitted BSSID based on the values carried in BSSID Index and the MaxBSSID Indicator subfields as described in 9.4.2.45 (Multiple BSSID element). A STA affiliated with the non-AP MLD that is associated with an AP corresponding to the nontransmitted BSSID can use this information to identify frames sent by the AP corresponding to the transmitted BSSID.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 4102 | Abhishek Patil | 9.4.2.295b.2 | 129.52 | The paragraph on Link ID Info subfield and BSS Parameter Change Count subfield doesn't not capture the intended meaning for nontransmitted BSSID case. | The Link ID subfield carries the link identifier for:- the AP that transmits the Basic variant Multi-Link element or the AP corresponding to the nontransmitted BSSID in the same multiple BSSID set as the AP that transmits the Multiple BSSID element containing the Basic variant Multi-Link element as a subelement in the profile for the nontransmitted BSSID- and is affiliated with the MLD that is described in the Multi-Link element.Similar changes need to be applied for the next paragraph for BSS Parameter Change Count subfield | **Revised**Agree with the comment. The existing spec text is confusing and doesn’t clearly differentiate the case of nontransmitted BSSID. The proposed change splits the text into bullets to cover each case separately.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4102** |
| 6013 | Liwen Chu | 9.4.2.295b.2 | 129.51 | Link ID in Common Info field can only be used to indicate the id of the reporting AP. Non-transmitted BSSID case should be removed. | As in comment | **Revised**Agree with the comment. The existing spec text is confusing and doesn’t clearly differentiate the case of nontransmitted BSSID. The proposed change splits the text into bullets to cover each case separately.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4102** |
| 7701 | Xiaofei Wang | 9.4.2.295b.2 | 129.52 | The sentence "The Link ID subfield indicates the link identifier of the AP that transmits the Basic variant Multi-Link element or the nontransmitted BSSID in the same multiple BSSID set as the AP that transmits the Basic variant Multi-Link element and affiliated with the MLD that is described in the Multi-Link element." is not very clear. Is the Link ID supposed to be set to the nontransmitted BSSID? 4 bits are not sufficient for nontransmitted BSSID. Please rewrite the sentence to clarify. | as in comment | **Revised**Agree with the comment. The existing spec text is confusing and doesn’t clearly differentiate the case of nontransmitted BSSID. The proposed change splits the text into bullets to cover each case separately.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4102** |

***TGbe editor: Please update the following paragraph in this subclause as shown below:***

[4102]The format of the Link ID Info subfield is defined in Figure 9-788ej (Link ID info subfield format). The Link ID subfield of the Link ID Info field indicates the link identifier of the AP that is affiliated with the AP MLD which is described in the Basic variant Multi-Link element and satisfies one of the following:

* It is the AP that transmitted the Basic variant Multi-Link element.
* It is the AP that corresponds to a nontransmitted BSSID that is a member of the same multiple BSSID set as the AP that transmitted the Multiple BSSID element containing the profile for the nontransmitted BSSID which includes the Basic variant Multi-Link element.

Link ID Info subfield in the Common info field is not present if the Basic variant Multi-Link element is sent by the non-AP STA.

***TGbe editor: Please update the following paragraph in this subclause as shown below:***

[4102]The BSS Parameters Change Count subfield in the Common Info field is one octet in length and carries an unsigned integer, initialized to 0. The value carried in the subfield is incremented when a critical update (as defined in 11.2.3.15 (TIM Broadcast)) occurs to the operational parameters for the AP that is affiliated with an AP MLD which is described in the Basic variant Multi-Link element and satisfies one of the following:

* It is the AP that transmitted the Basic variant Multi-Link element.
* It is the AP that corresponds to a nontransmitted BSSID that is a member of the same multiple BSSID set as the AP that transmitted the Multiple BSSID element containing the profile for the nontransmitted BSSID which includes the Basic variant Multi-Link element.

The BSS Parameters Change Count subfield in the Common info field is not present if the Basic variant Multi-Link element is sent by the non-AP STA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 6605 | Po-Kai Huang | 9.4.2.295c.2 | 146.22 | In D1.1, AAR support is in EHT MAC capabilities, but since this is a MLD feature, the bit shall be in MLD capabilities field. \Capability bit for AAR control is missing in MLD capabilities. | Move the capability bit of AAR control from EHT MAC to MLD capabilities. | **Revised**Agree with the comment. The AAR feature is related to MLO and applies at the MLD level. Therefore, the AAR Support subfield is moved from EHT MAC Capabilities to MLD Capabilities field of the Basic variant Multi-Link element. Corresponding text changes made to clause 35.3.15.7.2**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 6605** |
| 6021 | Liwen Chu | 9.4.2.295c.2 | 137.41 | The announcement of the support of Tx AAR Control is not needed. | change the draft per comment | **Revised**Agree with the comment. The ability to transmit AAR Control doesn’t need to be advertised. It is up to the non-AP MLD to transmit AAR Control (based on the capability of the associated AP MLD).**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 6021** |
| 7041 | Sigurd Schelstraete | 9.4.2.295c.2 | 136.51 | "AAR Support" in Table 9-322aq is not shown in Figure 9-788eu | Update figure | **Revised**Agree with the comment. Figure 9-788am is updated to show the AAR Support subfield since the subfield is moved to MLD Capabilities field of Basic variant Multi-Link element.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 7041** |
| 6016 | Liwen Chu | 9.4.2.295b.2 | 132.30 | change "For an EHT AP" to "For an AP MLD" | As in comment | **Accepted** |
| 6017 | Liwen Chu | 9.4.2.295b.2 | 132.35 | change "For an non-AP EHT STA" to "For an non-AP MLD" | As in comment | **Accepted** |
| 6019 | Liwen Chu | 9.4.2.295b.2 | 132.49 | change "For an non-AP EHT STA" to "For an non-AP MLD" | As in comment | **Accepted****TGbe editor: approved doc 11-21/1206r4 (Yunbo) has made this change.** |
| 6018 | Liwen Chu | 9.4.2.295b.2 | 132.55 | change "For an EHT AP" to "For an AP MLD" | As in comment | **Accepted****TGbe editor: approved doc 11-21/1206r4 (Yunbo) has made this change.** |

**9.4.2.295c.2 EHT MAC Capabilities Information field**

***TGbe editor: Move the entry for AAR support from Table 9-322aq to Table 9-322ao with additional changes as shown below***

**Table 9-322aq—Subfields of the EHT MAC Capabilities Information field**[6605]

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
|  |  |  |

**9.4.2.295b.2 Basic variant Multi-Link element**

**Table 9-322ao—Subfields of the MLD Capabilities field**[6605, 6021]

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| AAR Support | An AP MLD indicates support for receiving a frame with an AAR Control subfield. | If the +HTC-HE Support subfield is 1: Set to 1 if the AP MLD supports the AAR Control subfield functionality. Set to 0 otherwise.Reserved for non-AP MLD or if the +HTC-HE Support subfield is 0.See 35.3.15.7.2 (AP assisted medium synchronization recovery procedure). |

***TGbe editor: Please make the following changes to Figure 9-788em as shown below:***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 B3 | B4 | B5 B6 | B7 B11 | B12 | B13 B15 |
|  | Maximum Number Of Simultaneous Links | SRS Support | TID-To-Link Mapping Negotiation Supported | Frequency Separation For STR | AAR Support | Reserved |
| Bits: | 4 | 1 | 2 | 5 | 1 | 3 |

**Figure 9-788em—MLD Capabilities subfield format**[6605, 7041]

**35.3.15.7.2 AP assisted medium synchronization recovery procedure**

***TGbe editor: Please update the following paragraphs in this subclause as shown below:***

[6605]An AP affiliated with an AP MLD with dot11AAROptionImplemented equals to true shall set the AAR Support subfield in the MLD Capabilities field in a Basic variant Multi-link element it transmits to 1; otherwise the AP shall set the AAR Support subfield to 0.

A non-AP STA affiliated with a non-AP MLD with dot11AAROptionImplemented equals to true and that belongs to an NSTR link pair may transmit the AAR Control subfield in a frame to its associated AP affiliated with an AP MLD if it has received a Basic variant Multi-Link element from the AP with the AAR Support subfield equal to 1. The AAR Control subfield transmitted by a STA affiliated with a non-AP MLD carries the link identifier of another AP affiliated with the same AP MLD to solicit the other AP to transmit a Trigger frame to the other non-AP STA affiliated with the same non-AP MLD that belongs to the same NSTR link pair.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 8329 | Zhiqiang Han | 35.3.2.2 | 247.31 | (1) The complete information of a reported STA means the complete profile of a reported STA? (2) the reported AP were to transmit the Management frame? Is the Management frame transmitted by the reporting STA?(3)change were to was(4) Beacon frame can be included in the Management frame, but the next paragraph describes the complete profile of a reported AP shall not be included. They are contradictory. | Please clarify it | **Revised**The text in the cited paragraph was updated and simplified to clarify the intention and address any ambiguities. A NOTE was added to clearly call out the mgmt. frames that can carry complete profile.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 8329** |
| 4248 | Alfred Asterjadhi | 35.3.2.2 | 248.25 | The sentence starts with shall comprise the following, but then there are two bullets that say that those fields are not included. This seems not clear. Does it mean that it shall comprise the non-inclusion? Suggest to separate the two bullets as their own paragraph. | As in comment. | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 5904 | Li-Hsiang Sun | 35.3.2.2 | 248.04 | "each Per-STA Profile subelement, that is a complete profile, shall comprise of the followings:--(#1035)(#2451)The STA Control field"This bullet is not needed because STA Control field indicates Complete Profile, so it must be included in the Per-STA Profile subelement | delete the bullet | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 6571 | Payam Torab Jahromi | 35.3.2.2 | 248.10 | (1) Too many commas make the paragraph hard to parse, (2) I think intention has been to require the same field/element order for Association Response and Reassociation Response frames too but somehow the sentence reads as if the same order requirement is for Probe Response only, (3) Not all fields and elements are “defined” in the referenced tables, some are just “listed” (one can say their order is defined), prefer to use “in Table xyz” instead of “defined in Table xyz” or “listed in Table xyz” (“listed” is also acceptable but not preferred), (4) There are exceptions to some fields and elements as defined in lines 25-30, would be good to add “unless defined otherwise” or similar.Marking this comment technical to confirm that same order requirement is for all 3 frame subtypes | Change to: “If the reporting STA is an AP, the STA Profile field corresponding to the reported AP carries the same fields and elements (subject to the inheritance rules defined in 35.3.2.3 (Inheritance in a per-STA profile), and unless specified otherwise) and in the same order (unless specified otherwise) as fields and elements in Table 9-39 (Probe Response frame body) if the frame is a Probe Response frame that is an ML probe response, in Table 9-35 (Association Response frame body) if the frame is an Association Response frame, or in Table 9-37 (Reassociation Response frame body) if the frame is a Reassociation Response frame.” | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 6873 | Rubayet Shafin | 35.3.2.2 | 248.12 | Probe Response frame body carries Basic variant Multi-Link element if the AP is affiliated with AP MLD. It means if the STA Profile field in the Per-STA Profile subelement is carried in the Probe Response frame, then the Per-STA Profile subelement will carry another Multi-Link element, according to this sentence. However, this is in contradiction with the rule stated in page 247 line 25 (section 35.3.2.2) which says that the AP shall not include another Basic variant Multi-Link element in the Per-STA Profile subelement. | Please resolve this contradiction | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 6874 | Rubayet Shafin | 35.3.2.2 | 248.14 | Association Response frame body carries Basic variant Multi-Link element if the AP is affiliated with AP MLD. It means if the STA Profile field in the Per-STA Profile subelement is carried in the Association Response frame, then the Per-STA Profile subelement will carry another Multi-Link element, according to this sentence. However, this is in contradiction with the rule stated in page 247 line 25 (section 35.3.2.2) which says that the AP shall not include another Basic variant Multi-Link element in the Per-STA Profile subelement. | Please resolve this contradiction | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 6875 | Rubayet Shafin | 35.3.2.2 | 248.16 | Reassociation Response frame body carries Basic variant Multi-Link element if the AP is affiliated with AP MLD. It means if the STA Profile field in the Per-STA Profile subelement is carried in the Reassociation Response frame, then the Per-STA Profile subelement will carry another Multi-Link element, according to this sentence. However, this is in contradiction with the rule stated in page 247 line 25 (section 35.3.2.2) which says that the AP shall not include another Basic variant Multi-Link element in the Per-STA Profile subelement. | Please resolve this contradiction | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 6572 | Payam Torab Jahromi | 35.3.2.2 | 248.18 | (1) Better wording, (2) not all fields and elements are "defined" in the referenced tables, some are just "listed" (one can say their order is defined), prefer to use "in Table xyz" instead of "defined in Table xyz" or "listed in Table xyz" ("listed" is also acceptable but not preferred), (3) There are exceptions to some fields and elements as defined in lines 25-30, would be good to add "unless defined otherwise" or similar.Marking this comment technical to confirm that same order requirement is for both frame subtypes | Change to: "If the reporting STA is a non-AP STA, the STA Profile field corresponding to the reported non-AP STA carries the same fields and elements (subject to inheritance rules defined in 35.3.2.3 (Inheritance in a per-STA profile), and unless specified otherwise) and in the same order (unless specified otherwise) as fields and elements in Table 9-34 (Association Request frame body) if the frame is an Assocation Request frame, or in Table 9-36 (Reassociation Request frame body) if the frame is a Reassociation Request frame." | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 6877 | Rubayet Shafin | 35.3.2.2 | 248.31 | This fourth rule seems out of place. Why do need we need to mention this? Using rule 2 (Page 248, line 9), we already know what fields and elements shall be carried in STA Profile field and in what order. Adding this fourth rule creates confusion since it gives an impression that additional field(s) other than those mentioned in rule 2 and other than the optional (last) Non-Inheritance element may also be present in the STA Profile field (If this is the case, then the question becomes what will be the order in which they come?). | Please clarify this issue. | **Revised**The paragraph on contents of complete profile was updated as a resolution to several comments (4248, 5904, 6571, 6572, 6873, 6874, 6875, 6877, 6536). The updated text reorganizes the structure such that it is easier to understand the various rules that apply when including (or not) an element or a field in the complete profile.In addition, text in clause 35.3.2.1 was updated so that the exception rule, regarding which IEs are not allowed in the profile, applies to both AP and non-AP STA. Duplicate text from 35.3.5.4 was deleted**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 7719 | Xiaofei Wang | 35.3.2.2 | 248.09 | This bullet point seems to specifiy frame format. This paragraph should be moved to clause 9 or removed. | move the paragraph to clause 9 or delete | **Revised**The paragraph is revised as a resolution to several comment (including this one) to emphasize more on normative behavior and rules to help provide guidance to implementation regarding the order in which the element appears and which elements are disallowed in the per-STA profile in this section.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 7720 | Xiaofei Wang | 35.3.2.2 | 248.17 | This bullet point seems to specifiy frame format. This paragraph should be moved to clause 9 or removed. | move the paragraph to clause 9 or delete | **Revised**The paragraph is revised as a resolution to several comment (including this one) to emphasize more on normative behavior and rules to help provide guidance to implementation regarding the order in which the element appears and which elements are disallowed in the per-STA profile in this section.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4248** |
| 7848 | Yonggang Fang | 35.3.2.2 | 248.16 | This following sentence is not necessary and accurate: "In this example, only the STA MAC Address field is shown. However, there can be other fields present in the STA info portion whose presence is signaled via the subfields in the STA Control field." If there is a particular subfield in the STA Info field, please list it and remove "However, there can be other fields present in the STA info portion whose presence is signaled via the subfields in the STA Control field." | See the comment. | **Rejected**As stated in the cited text, this is an example figure and meant to depict the structure of complete profile. The fields shown the figure (and accompanying description text) are not meant to be exhaustive. |

**35.3.2.2 Advertisement of complete or partial per-link information**

***TGbe editor: Please update the following paragraph in this subclause as shown below:***

***TGbe editor: The changes shown below are applied over the approved docs 11-21/1087r5 (Gaurang).***

[8329]The complete profile of a reported STA consists of all the elements and fields (subject to exceptions discussed later in this subclause) that would be included in a Management frame, that is of the same subtype as that transmitted by the reporting STA carrying the Basic variant Multi-Link element, if the reported STA were to transmit the frame.

[8329]NOTE – Only Management frames belonging to subtypes (Re)Association Request, (Re)Association Response, or Probe Response that is an ML probe response can carry complete profile of a reported STA.

***TGbe editor: Please update the following paragraph in this subclause as shown below:***

[4248]Each Per-STA Profile subelement of the Basic variant Multi-Link element that is included in a Management frame transmitted by a STA affiliated with an MLD and that carries a complete profile shall consist of the STA Control field to identify the link on which the reported STA operates on and to carry the presence indicators for the subfield(s) within the STA Info field, the STA Info field, and the STA Profile field containing fields and elements based on the following rules:

* If the reporting STA is an AP, the STA Profile field corresponding to the reported AP:
	+ carries fields and elements in the same order and subject to conditions as in:
		- Table 9-39 (Probe Response frame body) if the frame is an ML probe response.
		- Table 9-35 (Association Response frame body) if the frame is an Association Response frame.
		- Table 9-37 (Reassociation Response frame body) if the frame is a Reassociation Response frame.
	+ is subject to inheritance rules defined in 35.3.2.3.1 (Inheritance in a per-STA profile of Basic variant Multi-Link element) and exceptions specified in 35.3.2.1 (General).
	+ does not include the Timestamp field, Beacon Interval field, AID field, SSID element, TIM element, and BSS Max Idle Period element.
* If the reporting STA is a non-AP STA, the STA Profile field corresponding to the reported non-AP STA:
	+ carries fields and elements in the same order and subject to conditions as in:
		- Table 9-34 (Association Request frame body) if the frame is an Association Request frame.
		- Table 9-36 (Reassociation Request frame body) if the frame is a Reassociation Request frame.
	+ is subject to inheritance rules defined in 35.3.2.3.1 (Inheritance in a per-STA profile of Basic variant Multi-Link element) and exceptions specified in 35.3.2.1 (General).
	+ does not include the Listen Interval field and Current AP Address field.
* Optionally, a Non-Inheritance element appears as the last element in the STA Profile field and carries a list of elements that are not inherited by the reported STA from the reporting STA (see 35.3.2.3.1 (Inheritance in a per-STA profile of Basic variant Multi-Link element)).

***TGbe editor: Please update Figure 35-3 in this subclause as shown below:***



**Figure 35-3 – Example of Basic variant Multi-Link element in an Association Request frame**

**35.3.2.1 General**

***TGbe editor: Please add the following paragraph in this subclause after the paragraph starting “***An AP affiliated with an AP MLD shall not include a Neighbor Report element,…***” as shown below:***

[4248]A STA affiliated with a non-AP MLD shall not include a Basic variant Multi-Link element in the Per-STA Profile subelement of the Basic variant Multi-Link element corresponding to a reported STA.

**35.3.5.4 Usage and rules of Basic variant Multi-Link element in the context of multi-link (re)setup**

***TGbe editor: Please update the following paragraph in this subclause as shown below:***

[4248]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 6536 | Pascal VIGER | 35.3.2.3 | 249.27 | In order to clarify the concept, it shall be useful to indicate that the inherited elements of reporting STA are outside the ML Element. | Complete sentence: "As a result, some elements carried in the per-STA profile for a reported STA can be identical to same elements for the reporting STA ..." with "...that precede the Basic variant Multi-Link element". | **Revised**The text in the first paragraph of 35.3.2.3.1 was updated to provide clarity on inheritance.Furthermore, the fourth paragraph was updated to clarify that certain elements such as ML IE are not inherited.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 6536** |
| 5968 | Liwen Chu | 35.3.2.3 | 249.36 | Change the first sentence to "if a element with element ID of the reported STA is different from the element with the me element ID of the reporting STA, the STA that transmits a Management frame carrying the Basic variant Multi-Link element shall include the element..." or "A STA that transmits a Management frame carrying the Basic variant Multi-Link element shall include all the elements that are specific to the reported STA..." | As in comment | **Revised**The third paragraph in clause 35.3.2.3.1 was updated as a resolution to CIDs 5968, 5898 and 8226. The updated text clarifies the conditions when an element is carried in a complete profile of a reported STA.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 5968** |
| 5898 | Liangxiao Xin | 35.3.2.3 | 249.41 | broken english here."--its value is different from the element, if advertised by the reporting STA that has the same Element ID and Extended Element ID (if present) | its value is different from the element that has the same Element ID and Extended Element ID and that is advertised by the reporting STA (if present) | **Revised**The third paragraph in clause 35.3.2.3.1 was updated as a resolution to CIDs 5968, 5898 and 8226. The updated text clarifies the conditions when an element is carried in a complete profile of a reported STA.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 5968** |
| 8226 | Yuxin LU | 35.3.2.3 Inheritance in a per-STA profile | 249.41 | For the first condition, if "the element" is not advertised by the reporting STA, the first condition would not exist. | Remove "if". Such as change "its value is different from the element, if advertised by the reporting STA..." to "its value is different from the element which is advertised by the reporting STA..." | **Revised**The third paragraph in clause 35.3.2.3.1 was updated as a resolution to CIDs 5968, 5898 and 8226. The updated text clarifies the conditions when an element is carried in a complete profile of a reported STA.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 5968** |
| 7812 | Yiqing Li | 35.3.2.3 | 249.63 | The NOTE 3 here seems to describe the the case where the reported STA does not satisfy the condition for that element to be included in the frame while the reporting STA satisfies the corresponding condition. What does the description "a value specific to the reported STA" mean? Please calrify this defition. Besides, the elements not applicable to the reported STA but carried in the Management frame should be included in the Non-Inheritance element with its element ID and extended elemetn ID (if present). | Please clarify the description "a value specific to the reported STA". The case where there are different values for the same element and the case where the elements are not applicable to the reported STA but carried in the Management frame tranmistted by the reporting STA shall be distinguished. | **Revised**The text in the subclause was updated to cover the case where there can be a difference in the number of applicable element (having the same Element ID and Element ID Extension (if present)) between the reporting STA and the reported STA. In such case inheritance doesn’t apply and the element(s) that apply to the reported STA are explicitly carried in the Per-STA Profile subelement. The text is also updated to align with baseline spec (REVme) [11-21/1664r1]. Due to these changes, some of the NOTEs in this subclause are not needed anymore and were deleted. **TGbe editor, please implement changes as shown in doc 11-21/1176r8 tagged 7812** |
| 5048 | Gaurang Naik | 35.3.2.3 | 249.48 | Clarify the rules related to inheritance of the Vendor specific elements when elements are carried in the frame body as well as in the Per-STA profile, when the number of Vendor specific elements in the frame body and in the Per-STA profile are different | As in comment | **Revised**Agree with the comment. A new NOTE was added to cover the case when there is a difference in the number of applicable instances of an element between the reported and reporting STA. In such case the applicable elements are included in the per-STA profile. This case is not the same as from non-inheritance.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4037** |
| 4037 | Abhishek Patil | 35.3.2.3 | 249.63 | The spec needs to clarify the case when the number of elements having the same Element ID and Extended Element ID (if applicable) carried in the Mgmt frame for the reporting STA and that for the reported STA are different. For example, a single Vendor Specific element applies to the reporting STA and more than one Vendor Specific element applies to the reported STA. | Add another NOTE as follows:It is possible that more than one element with the same Element ID and Extended Element ID (if present), applies to a (reporting or the reported) STA. If there is a difference in the number of elements with the same Element ID and Extended Element ID (if present) for the reported and reporting STA, then inheritance is not applied for that element and the profile for that reported STA includes all the instance of that elements, each containing a value specific to the reported STA. | **Revised**Agree with the comment. A new NOTE was added to cover the case when there is a difference in the number of applicable instances of an element between the reported and reporting STA. In such case the applicable elements are included in the per-STA profile. This case is not the same as from non-inheritance.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 4037** |
| 8331 | Zhiqiang Han | 35.3.2.3 | 250.26 | There is no description about Per-STA Profile y. Please delete it or add some description about Per-STA Profile y. | Please clarify it | **Revised**Agree with the comment. The description text was updated to clarify that the figure shows the expanded profile for only one of the reported STA. In addition, to avoid confusion with element Y, the profile references are changed to Profile 1 (STA 1) and Profile 2 (STA 2).**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 8331** |
| 5907 | Li-Hsiang Sun | 35.3.2.3 | 250.37 | Capability Info field should be included after STA Info because a field is not inherited | as in comment | **Revised**Agree with the comment. Figure 35-4 was updated to show Capability Information field as the first subfield within the STA Profile field.**TGbe editor, please implement changes as shown in doc 11-21/1176r5 tagged 5907** |

* + - 1. **Inheritance in a per-STA profile**
				1. **Inheritance in the per-STA profile of Basic variant Multi-Link element**

***TGbe editor: Please update the first paragraph in this subclause as shown below:***

[6536]It is possible for STAs affiliated with an MLD to have similar capabilities and operational parameters on different links. As a result, an element that is applicable to a reported STA might have the same value as the corresponding element applicable to the reporting STA and carried in the frame outside the Basic variant Multi-Link element. To reduce the frame size, when a Per-STA Profile subelement carries complete profile for a reported STA, it inherits the elements from the reporting STA based on the rules defined in this subclause.

***TGbe editor: Please update the 3rd, 4th, and 5th paragraphs along with the NOTEs in this subclause as shown below:***

[7812][5968]A STA that transmits a Management frame carrying the Basic Multi- Link element shall include an element that is specific to the reported STA in the complete profile of the reported STA carried in the Basic Multi-Link element. An element, identified by an Element ID and Element ID Extension (if applicable), is considered to be specific to a reported STA if any of the following conditions are satisfied:

* At least one ~~an~~ element with the same Element ID and Extended Element ID (if applicable) is included in the frame that carried the Basic Multi-Link element but the contents of the Information field are not the same for the reported STA if the reported STA were to transmit the same Management frame subtype.
* the reported STA satisfies the condition for that element to be included in the same Management frame subtype as the frame that carries the Basic Multi-Link element while the reporting STA does not satisfy the corresponding condition.

NOTE 1 – For example, when there exists one or more Vendor Specific elements carried in a Management frame that includes the Basic Multi-Link element containing a per-STA profile for a reported STA, and the contents of the Information field for at least one of the Vendor Specific element are not the same as that of at least one Vendor Specific element that applies to the reported STA then, each Vendor Specific element that applies to the reported STA is included in its Per-STA Profile subelement.

NOTE 2—The above rules do not apply for the case when the Basic Multi-Link element is carried in a nontransmitted BSSID profile. See 35.3.19 (Multi-link operation in a multiple BSSID set or co-hosted BSSID set for inheritance rules when the Basic Multi-Link element is carried in a Multiple BSSID element.

NOTE 3—The conditions to include an element in a particular Management frame are as specified in 9.3.3 ((PV0) Management frames). For example, Table 9-35 (Association Response frame body) specifies the conditions for an element to be included in an Association Response frame.

[7812][6536]If an element, identified by an Element ID and Element ID Extension (if applicable), is carried in a Management frame transmitted by the reporting STA, and there is no element having the same Element ID and Element ID Extension (if applicable) in a complete profile of a reported STA, then the element is considered to be part of the reported STA’s profile and the value to use is the same as that of the corresponding element carried in the reporting STA’s frame unless any of the following are true:

* the complete profile carries the Non-Inheritance element (see 9.4.2.240 (Non-Inheritance element)) and the element is listed in the Non-Inheritance element.
* the element is excluded from being included in the Per-STA Profile subelement as described in 35.3.2.1 (General) and 35.3.2.2 (Advertisement of complete or partial per-link information).

[7812]Otherwise, the STA receiving the Management frame shall not consider the element to be part of the reported STA’s profile.

[7812]A Fragment element (9.4.2.188 (Fragment element)) is considered under the same context as the element that is being fragmented. Therefore, when an element that is fragmentable (see Table 9-128 (Element IDs) and 10.28.11 (Element fragmentation)) is inherited (or not inherited), the Fragment element(s) (if present) corresponding to that element shall also be inherited (or not inherited).

[7812]~~NOTE 3—When multiple elements (such as Vendor Specific elements) carried in the Management frame transmitted by the reporting STA have the same Element ID and Extended Element ID (if present) and at least one such (Vendor Specific) element is not applicable to the reported STA, then the per-STA profile corresponding to the reported STA includes all the elements that have the contents of the Information field applicable only to the reported STA and have the same Element ID and Extended Element ID (if present) as that in the reporting STA’s frame. In this case, inheritance is not applied for such elements.~~

[7812] ~~[4037]NOTE 4 - When there is a difference in the number of elements (such as Vendor Specific elements) with the same Element ID and Extended Element ID (if present) for the reported and reporting STA, then inheritance is not applied for that element and the complete profile for that reported STA includes one or more instance of that element, each carrying Information field applicable only to the reported STA.~~

[7812]~~[4037]NOTE 5 – When an element that is fragmentable (see Table 9-92 (Element IDs) and 10.28.11 (Element fragmentation)) is inherited (or not inherited), the Fragment element(s) (if present) corresponding to that element are also inherited (or not inherited).~~

[8331]Figure 35-4 (Example of inheritance in a complete per-STA profile) illustrates inheritance when a per-STA profile carries complete information. The example shows a Management frame transmitted by a reporting STA that is affiliated with an MLD. The Management frame carries several elements with their corresponding element IDs shown in parenthesis. The frame also carries a Basic variant Multi-Link element which is carrying two Per-STA Profile sublements corresponding to STA 1 and STA 2. In this example, the profile for STA 1, which is a complete profile, is expanded to show the details of inheritance. The contents of the profile for STA 2 are not shown in this illustration. The per-STA profile for STA 1 includes element with ID B since the element has a value different from the corresponding elements carried in the frame. The profile also includes element with ID D and ID Y that are specific to STA 1. In addition, elements with ID C and ID F are inherited and are not carried in the profile for STA 1. The values for these two elements are the same as that carried in the frame. Furthermore, elements with ID A and ID E are not applicable to STA 1 as their corresponding (Extended) Element IDs are listed in the Non-Inheritance element.

***TGbe editor: Please update Figure 35-4 in this subclause as shown below:***



**Figure 35-4—Example of inheritance in a complete per-STA profile**[8331, 5907]