IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CC36 Resolution for Miscellaneous CIDs in Clause 9 | | | | |
| Date: August 10, 2021 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Gaurang Naik | Qualcomm Inc. |  |  | gnaik@qti.qualcomm.com |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm Inc. |  |  | aasterja@qti.qualcomm.com |
| George Cherian | Qualcomm Inc. |  |  | gcherian@qti.qualcomm.com |
| Duncan Ho | Qualcomm Inc. |  |  | dho@qti.qualcomm.com |
| Yanjun Sun | Qualcomm Inc. |  |  | yanjuns@qti.qualcomm.com |
| Abdel Karim Ajami | Qualcomm Inc. |  |  | aajami@qti.qualcomm.com |
| Rubayet Shafin | SRA |  |  |  |
| Tomo Adachi | Toshiba |  |  |  |

Abstract

This submission proposes resolutions for 19 CIDs received for TGbe CC36:

4105, 6181, 6230, 5767, 6226, 6565, 6975, 7846, 8294, 4269, 7708, 4026, 4813, 7567, 7703, 5832, 7618, 7616, 7617

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Added resolutions for the following 8 CIDs and made changes based on offline feedback
  + CID 4026, 4813, 7567, 7703, 5832, 7618, 7616, 7617
* Rev 2: Changes based on offline feedback received from members
  + Added EHT Capabilities/Operation element to Mesh Peering Open frame and Mesh Peering Confirm frame. Changes are tagged as CID 4026.
* Rev 3: Changes based on feedback received during the MAC call on 09/13
  + Changes highlighted
  + Deferred CID 4026
* Rev 4: Reverting some changes made based on offline discussions
  + Changes highlighted
  + Added CID 4026

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** | **Section** | **Pg.Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 4105 | Abhishek Patil | 9.4.2.26 | 120.24 | A STA is "affiliated with" a non-AP MLD | replace "STA of a non-AP MLD" with "STA affiliated with a non-AP MLD" | **Revised**  Agree with the comment.  **TGbe editor please implement changes as proposed in CID 4105 and shown in doc 11-21/1264r4 tagged as 4105** |
| 6181 | Michael Montemurro | 9.4.2.26 | 120.24 | It a STA affiliated with a non-AP MLD, not a STA "of". | Change "or a STA of" to "or as STA affiliated with" | **Revised**  Agree with the comment.  **TGbe editor please implement changes as proposed in CID 4105 and shown in doc 11-21/1264r4 tagged as 4105** |
| 6230 | Ming Gan | 9.4.2.36 | 120.57 | Please split this paragraph into two parts, one is for Capabilities element, the other is for Operation element | as in the comment | **Rejected**  The comment fails to identify a technical issue. Please note that the statement is aligned with the corresponding statements for the HT/VHT/HE Capabilities and Operation elements. Please see P1228 and P1229 of REVme D0.2. Hence keeping the same structure ensures consistency across amendments. |
| 5767 | Laurent Cariou | 9.4.2.36 | 120.58 | This sentence is not clear about EHT capabilities. Also it does not mention the ML element that can also be included. | as in comment | **Revised**  The statement related to EHT Capabilities and Operation elements is aligned with the corresponding statements for the HT/VHT/HE Capabilities and Operation elements. Please see P1228 and P1229 of REVme D0.2. Hence keeping the same structure ensures consistency across amendments.  The Basic Multi-Link element was added separately because the statement is applicable only to the Common Info field of the Basic Multi-Link element. As per 11be D1.1, the Basic Multi-Link element carried in a Neighbor Report element cannot carry the Link Info field. Hence, when critical updates defined in subclause 35.3.10 occur, the Multi-Link element carried in the Beacon frames of the reported AP will be different from the Multi-Link element carried in the Neighbor Report element corresponding to the reported AP.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 5767** |
| 6226 | Ming Gan | 9.4.2.36 | 121.32 | When is the basic variant Multi-Link element present in Neighbor Report element, please make it complete. | as in the comment | **Revised**  Agree with the comment. The condition for inclusion of the Basic Multi-Link element was clarified. The ML element is included in a Neighbor Report element if the reported AP is affiliated with an AP MLD. Otherwise, the ML element is not included.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 6226** |
| 6565 | Payam Torab Jahromi | 9.4.2.240 | 126.33 | Reword for better reading (simiar comment to be submitted to 11me for the baseline paragraph before). | Change to "When present in the Per-STA Profile subelement of a Basic variant Multi-link element, the Non-Inheritance element identifies one or more elements that are not inherited by the STA corresponding to the per-STA profile. The identified elements are present in the Management frame of the STA that carried the Basic variant Multi-Link element." | **Revised**  Agree with the commenter. The identified statement was revised.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 6565** |
| 6975 | Sanghyun Kim | 9.4.2.295b.2 | 136.05 | The STA requesting complete information is the non-AP STA, not the AP STA. | change 'from the AP' to 'to the AP' | **Revised**  The identified statement is revised for more clarity in doc 11-21/1274 as a resolution for CID 7586.  **Tgbe editor no further changes are required for the resolution of this CID.** |
| 7846 | Yonggang Fang | 9.4.2.295c.1 | 136.28 | Suggest to change "EHT MAC Capabilities Information" to "EHT MAC Capabilities Control" to align with the naming convention of other IEs, like "Basic variant Multi-Link element", "Probe Request variant Multi-Link element". | See the comment. | **Rejected**  The subfield “EHT MAC Capabilities Information” provides capability information of the EHT AP. The purpose of the fields “Multi-Link Control” or “STA Control” is to provide presence indicators in other fields/subfields and identify the ML element variant.  Additionally, the name “Information” is aligned with subfield names in the HE Capabilities element, VHT Capabilities element, and HT Capabilities element. Therefore, “EHT MAC Capabilities Information” is more appropriate than “EHT MAC Capabilities Control”. |
| 8294 | Zhiqiang Han | 9.4.2.295c.2 | 137.36 | Change "a STA" to "the STA" | as in comment. | **Accepted** |
| 4269 | Alfred Asterjadhi | 9.4.2.295c.2 | 150.60 | Replace the last 7 rows with a single one that lists values from 9-15. | As in comment. | **Revised**  Agree with the comment.  **TGbe editor please implement changes as proposed in CID 4269 and shown in doc 11-21/1264r4 tagged as 4269** |
| 7708 | Xiaofei Wang | 9.6.7.36 | 155.20 | operating channel width value says Reserved instead of 320 MHz, change "Reserved" to "320 MHz" | as in comment | **Rejected**  The “Reserved” entry is for HR/DSSS, OFDM, ERP, HT, VHT, or HE BSS, which is correct since they do not support 320 MHz bandwidth. Additionally, EHT does not support 80+80 MHz bandwidth, which is why a separate column was added. |
| 4026 | Abhishek Patil | 9.6.12 | 156.01 | Since AID is assigned at the MLD level, the description of AID element (9.4.2.163) and the AID field in the Tables under clause 9.6.12 must be updated. | As in comment | **Revised**  Agree with the comment. The description of the AID element was updated. Tables 9-414 and 9-415 in clause 9.6.12 were also updated.  Additionally, based on offline feedback, Tables 9-480 and 9-481 were updated to include the EHT Capabilities and EHT Operation element.  **TGbe editor please implement changes as proposed in CID 4026 and shown in doc 11-21/1264r4 tagged as 4026** |
| 4813 | Dibakar Das | 9.4.2.295b.1 | 128.24 | "The Common Info field consists of zero or more subfields whose presence is indicated by the subfields of the Multi-Link Control field.".. Seems redundant since we already have the following text above: "The Presence Bitmap subfield is used to indicate the presence of various subfields in the Common Info field " | Clarify the difference or merge the two texts. | **Revised**  Agree with the comment. The first sentence “The Common Info field consists of zero or more subfields whose presence is indicated by the subfields of the Multi-Link Control field” was deleted.  In addition, the statement related to the ordering of the subfields in the Common Info field was deleted as the ordering is clear from the formats of the Presence Indicator subfield and the Common Info field.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 4813** |
| 7567 | Tomoko Adachi | 9.4.2.295b.1 | 128.35 | "The Link Info field carries information specific to the links and is optionally present based on the value of the Type subfield (see 9.4.2.295b.2 (Basic variant Multi-Link element) and 9.4.2.295b.3 (Probe Request variant Multi-Link element))." While looking at 9.4.2.295b.2 and 9.4.2.295b.3, both have similar descriptions saying that it contains zero or more subelements and the only difference seems to be that for the Basic variant, Vendor Specific subelement is allowed, while for the Probe Request variant, it is not allowed. So, saying it "is optionally present based on the value of the Type subfield" is not correct. The sentence should be fixed. | As in comment. | **Revised**  Agree with the comment. The Link Info field is optional in both variants of the Multi-Link element. In a Basic Multi-Link element, there is no Link Info field when carried in a Beacon frame (except when conditions in 35.3.9 are satisfied). Similarly, in a Probe Request variant Multi-Link element, there is no Link Info field when the non-AP STA of the non-AP MLD requests complete information of all APs of the AP MLD. Thus, “Type” subfield of the Common Info field does not determine whether the Link Info field is present or absent. The part of the sentence “based on the value of the Type subfield (see 9.4.2.295b.2 (Basic Multi-Link element) and 9.4.2.295b.3 (Probe Request Multi-Link element))” was deleted.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 7567** |
| 7703 | Xiaofei Wang | 9.4.2.295b.2 | 132.61 | If the link info field contains zero subelements, then the Link Info field doesn't exist. The language saying that a Link Info field contains zero subelements is not correct.Please rewrite to clarify this language. | as in comment | **Rejected**  The style of the cited text is consistent with other such instances in the baseline standard. The issue highlighted by the commenter is also true for other fields. It is implied that if a field carries no optional subelements/subfields and if there are no mandatory subfields, then that field is not present. |
| 5832 | Lei Wang | 9.4.2.295b.2 | 133.05 | Why the word "optional" is needed in Subelement ID definition? If it is intended to tell the inclusion of Subelement is optional, then it is clearly specified by the sentence in line 61 page 132, i.e., "The Link Info field contains zero or more subelements." | Remove the word "optional" for the description of the subelement IDs for Basic variant Multi-Link element. | **Rejected**  The word “optional” not only implies that the Link Info field carries zero or more subelements as the commenter has pointed out, but also indicates that the inclusion of each subelement listed in the Table is optional. For example, inclusion of the Vendor Specific subelement is optional. Therefore, the word “optional” is required. Additionally, this is consistent with the description of other elements in the baseline that can carry subelements. |
| 7618 | Tomoko Adachi | 11.20.1 | 0.00 | Only the presence of the EHT Operation element is described. The presence of the EHT Capabilities element should be described for the setup request and setup response frames. | As in comment. | **Rejected**  The baseline standard includes description of only the HT/VHT/HE Operation elements in the TDLS Setup Confirm frame. The text does not describe inclusion of the HT/VHT/HE Capabilities element in the frames. Therefore, to keep the contents of the frame consistent across all the amendments, the comment is rejected. |
| 7616 | Tomoko Adachi | 9.6.12.2 | 0.00 | The EHT Capabilities element is added to a TDLS Setup Request Action frame. However, most of the contents carried by the EHT MAC Capabilities Information subfield in the EHT Capabilities element do not relate with direct communication. The NSEP Priority Access is between an AP and a non-AP STA, I believe. The triggered TXOP sharing is obviously between an AP and a non-AP STA. The AAR is obviously between an AP and a non-AP STA. The indication of supporting these features in the EHT Capabilities element should be set to 0 and desribed as they are not used in TDLS setup. | As in comment. | **Revised**  Agree with the commenter in principle. Many of the fields in the EHT Capabilities element do not apply to the TDLS direct link. However, the same is true for fields in the VHT/HE/S1G Capabilities elements. A general statement was added in Clause 11.20.1.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 7616** |
| 7617 | Tomoko Adachi | 9.6.12.3 | 0.00 | The EHT Capabilities element is added to a TDLS Setup Response Action frame. However, most of the contents carried by the EHT MAC Capabilities Information subfield in the EHT Capabilities element do not relate with direct communication. The NSEP Priority Access is between an AP and a non-AP STA, I believe. The triggered TXOP sharing is obviously between an AP and a non-AP STA. The AAR is obviously between an AP and a non-AP STA. The indication of supporting these features in the EHT Capabilities element should be set to 0 and desribed as they are not used in TDLS setup. | As in comment. | **Revised**  Agree with the commenter in principle. Many of the fields in the EHT Capabilities element do not apply to the TDLS direct link. However, the same is true for fields in the VHT/HE/S1G Capabilities elements. A general statement was added in Clause 11.20.1.  **Tgbe editor please implement changes as shown in doc 11-21/1264r4 tagged as 7616** |

***TGbe editor: Please note Baseline is 11be D1.1 and REVme D0.2 and approved changes in doc 11-21/1274r4***

**9.4.2.26 Extended Capabilities element**

***TGbe editor: Please revise the Table as shown below [CID 4105]***

**Table 9-153—Extended Capabilities field**

|  |  |  |
| --- | --- | --- |
| **Bit** | **Information** | **Notes** |
| 17 | WNM Sleep Mode | ~~The~~ A non-AP STA or a STA affiliated with (#4105) a non-AP MLD sets the WNM Sleep Mode field to 1 when dot11WNMSleepModeActivated is true, and sets it to 0 otherwise. See 11.2.3.16 (WNM sleep mode). |

**9.4.2.36 Neighbor Report element**

***TGbe editor: Please revise the text as shown below [CID 5767]***

The Extremely High Throughput subfield is set to 1 to indicate that the AP represented by this BSSID is an EHT AP and that the EHT Capabilities element (or EHT Operation element), if included as a subelement in the report, is identical in content to the EHT Capabilities element (EHT Operation ele­ment) included in the neighboring AP’s Beacon frame. Otherwise, the Extremely High Throughput subfield is set to 0.

When the Extremely High Throughput subfield is set to 1, the Basic Multi-Link element, if included as a subelement in the report, the included fields are ~~is~~ identical in content to ~~all~~ the corresponding fields that are present in the Basic Multi-Link element included in the neighboring AP’s Beacon frame (#5767).

NOTE – A Basic Multi-Link subelement included in a Neighbor Report element does not carry the Link Info field as described in 35.3.2 (Advertisement of multi-link information in Multi-Link element) (#5767).

***TGbe editor: Please revise the text as shown below [CID 6226]***

The Basic Multi-Link subelement is the same as the Basic Multi-Link ele­ment defined in 9.4.2.295b.2 (Basic Multi-Link element). The Basic Multi-Link subelement is present in a Neighbor Report element corresponding to a reported AP if the reported AP is affili­ated with an AP MLD. Otherwise, the Basic Multi-Link subelement is not present (#6226).

**9.4.2.240 Non-Inheritance element**

***TGbe editor: Please revise the text as shown below [CID 6565]***

When present in the Per-STA Profile subelement of a Basic Multi-Link element, the Non-Inheritance element identifies one or more elements that are not inherited by the STA corresponding to the per-STA pro­file. The identified elements are present in the Management frame of the STA that carried the Basic Multi-Link element. (#6565)

**9.4.2.295c EHT Capabilities element**

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

***TGbe editor: Please revise the text as shown below [CID 4269]***

**Table 9-322at—Encoding of the maximum number of Nss for a specified MCS value**

|  |  |
| --- | --- |
| **Max Nss subfield value** | **Maximum number of spatial streams that supports the specified MCS set** |
| 0 | Not supported |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9-15 (#4269) | Reserved |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**9.4.2.163 AID element**

***TGbe editor: Please revise the following paragraph as shown below [CID 4026]***

The AID element includes the AID assigned by an AP or an AP MLD during association (see 11.3 (STA authentication and association)) that represents the 16-bit ID of a STA or a non-AP MLD, respectively (#4026). The format of the AID element is shown in Figure 9-619.

**9.6.12 TDLS Action field formats**

**9.6.12.2 TDLS Setup Request Action field format**

***TGbe editor: Please revise the following Table as shown below [CID 4026]***

**Table 9-414 – Information for TDLS Setup Request Action field**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 19 | AID | The AID element containing the AID of the STA or non-AP MLD whose affiliated STA is sending the frame is present if dot11VHTOptionImplemented or dot11HEOptionImplemented or dot11EHTOptionImplemented or dot11S1GOptionImplemented is true. (#4026) |

**9.6.12.3 TDLS Setup Response Action field format**

***TGbe editor: Please revise the following Table as shown below [CID 4026]***

**Table 9-414 – Information for TDLS Setup Request Action field**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 20 | AID | The AID element containing the AID of the STA or non-AP MLD whose affiliated STA is sending the frame is present if dot11VHTOptionImplemented or dot11HEOptionImplemented or dot11EHTOptionImplemented or dot11S1GOptionImplemented is true and the Status Code is SUCCESS and not present otherwise. (#4026) |

**9.6.15.2 Mesh Peering Open frame format**

**9.6.15.2.2 Mesh Peering Open frame details**

***TGbe editor: Please add the following two rows to Table 9-436 as shown below [CID 4026]:***

**Table 9-480 – Mesh Peering Open frame Action field format**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 24 | EHT Capabilities | The EHT Capabilities element is present when dot11EHTOptionImplemented is true; otherwise it is not present |
| 25 | EHT Operation | The EHT Operation element is present when dot11EHTOptionImplemented is true; otherwise it is not present |

**9.6.15.3 Mesh Peering Confirm frame format**

**9.6.15.3.2 Mesh Peering Confirm frame details**

***TGbe editor: Please add the following two rows to Table 9-437 as shown below [CID 4026]:***

**Table 9-481 – Mesh Peering Confirm frame Action field format**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 20 | EHT Capabilities | The EHT Capabilities element is present when dot11EHTOptionImplemented is true; otherwise it is not present |
| 21 | EHT Operation | The EHT Operation element is present when dot11EHTOptionImplemented is true; otherwise it is not present |

**9.4.2.295b Multi-Link element**

**9.4.2.295b.1 General**

***TGbe editor: Please revise the following Table and paragraphs as shown below [CID 4813]:***

**Table 9-322am – Type subfield encoding**

|  |  |
| --- | --- |
| **Type subfield value** | **Multi-link element variant name** |
| 0 | Basic (see 9.4.2.295b.2 (Basic Multi-Link element)) (#4813) |
| 1 | Probe Request (see 9.4.2.295b.3 (Probe Request Multi-Link element)) (#4813) |
| 2-7 | Reserved |

The Presence Bitmap subfield is used to indicate the presence of various subfields in the Common Info field and has different format for different variants of the Multi-Link element as described in the subclauses below (#4813).

The Common Info field carries information that is common to all the links except for Link ID Info subfield and BSS parameters Change Count subfield that are for the link on which the Multi-Link element is sent (#4813).

(#4813)

The Link Info field carries information specific to the links and is optionally present. (#7567)

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

***TGbe editor: Please add a new subclause before the following paragraph as shown below [CID 7567]***

**9.4.2.295b.2.1 Common Info field of the Basic Multi-Link element**

The format of the Common Info field of the Basic variant Multi-Link element is defined in Figure 9-788ei (Common Info field of the Basic variant Multi-Link element format).

…

***TGbe editor: Please add a new subclause before the following paragraph as shown below [CID 7567]***

**9.4.2.295b.2.2 Link Info field of the Basic Multi-Link element**

The Link Info field contains zero or more subelements. The subelement format and ordering of subelements are defined in 9.4.3 (Subelements).

---------------------------------------------------------------------------------------------------------------------------------

**11.20 Tunneled direct-link setup**

**11.20.1 General**

***TGbe editor: Please add the following paragraph as the last paragraph in the subclause [CID 7616, 7617]:***

(#7616) When a STA receives a TDLS Setup Request frame or TDLS Setup Response frame from a peer STA that includes one or more elements among the HT Capabilities, VHT Capabilities, HE Capabilities, HE 6 GHz Band Capabilities, S1G Capabilities, or EHT Capabilities element, it shall ignore the fields that do not apply to the TDLS direct link with the peer STA.

**DISCUSSION**

**TGbe Editor: Please note that the following text/changes are shown only for discussions.**

**[CID 6975]**

The Complete Profile subfield is set to 1 when complete information (#7586) of the AP identified by the Link ID subfield is requested as defined in 35.3.4.2 (Use of ML probe request and response). Otherwise, the subfield is set to 0.

**[CID 8294]**

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

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| Triggered TXOP Sharing Support | Indicates support for transmitting or responding to a TXOP sharing trigger frame that does not solicit TB PPDU. | For an EHT AP:  Set to 1 to indicate that the AP is capable of transmitting a modified MU-RTS frame that allocates time to a STA to transmit non-TB PPDUs (see 35.2.1.3 (Triggered TXOP sharing procedure)).  Set to 0 otherwise.  For an non-AP EHT STA:  Set to 1 to indicate that the non- AP STA is capable of responding to a modified MU-RTS frame that allocates time to the STA to transmit non-TB PPDUs (see 35.2.1.3 (Triggered TXOP sharing procedure)).  Set to 0 otherwise. |

**[CID 7708]**

**Table 9-384—BSS Operating Channel Width**

|  |  |  |  |
| --- | --- | --- | --- |
| **BSS Operating Channel Width field** | **HR/DSSS, OFDM, ERP, HT, VHT, or HE BSS**  **operating channel width** | **EHT BSS operating channel width** | **TVHT BSS operating channel width** |
| 0 | 20 MHz or 22 MHz | 20 MHz or 22 MHz | TVHT\_W |
| 1 | 40 MHz | 40 MHz | TVHT\_W+W |
| 2 | 80 MHz | 80 MHz | TVHT\_2W |
| 3 | 160 MHz or 80+80 MHz | 160 MHz | TVHT\_4W or TVHT\_2W+2W |
| 4 | Reserved | 320 MHz | Reserved |
| ~~4~~5–7 | Reserved | Reserved | Reserved |