IEEE P802.11  
Wireless LANs

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| CR for Misc CIDs | | | | |
| Date: 2024-06 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Duncan Ho | Qualcomm Technologies | 5665 Morehouse Drive, San Diego, CA 92131 | (858)829-9509 | dho@qti.qualcmom.com |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for following CIDs:

23002, 23041, 23149, 23150, 23154, 23160

**Revisions:**

* Rev 0: Initial version of the document.

***TGbe editor: The baseline for this document is 11be D6.0***

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.***

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 23002 | Binita Gupta | 5.1.5.1 | 82.61 | Figure 5-2a shows the MAC data plane architecture for MLO for individually addressed data frames, and is extremely helpful to understand the data plane functions for individually addressed data frames. It will be very useful to also show a similar data plane architecture for MLD group addressed data frames, for understanding of the group addressed data plane functions. | Add a Figure showing MLO MAC data plane architecture for group addressed data frames. | **Rejected**  The comment fails to identify a specific issue to be addressed. It fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined.  Please note that the normative requirements of group addressed frames are captured in 35.3.15 MLO group addresses frames. |
| 23041 | Abhishek Patil | 9.4.2.325 | 300.45 | The amount of time a non-AP STA would need to serve its p2p traffic (to the p2p peer STA) would depend on the bandwidth of the p2p link. Therefore, the value carried in the Medium Time field needs to be with respect to a certain bandwidth (or normalized to 20 MHz bandwidth). In addition, the bandwidth of the p2p link will not be known to the AP since the peer STAs capabilities can be different from the associated non-AP STA that makes the request. Therefore, TGbe needs to provide a means for a non-AP STA to let its associated AP know the bandwidth of the p2p link. | As in comment. | **Revised**  Agree with the comment. See the proposed changes tagged as (#23041) in this document to address this CID.  **TGbe Editor: please apply the changes tagged as (#23041) in this CR.** |
| 23149 | Brian Hart | 5.1.5.1 | 83.26 | This is an evolution of CID 22291 that only partially addressed the concerns raised. Fig 5-2b does not account for groupcast frames | Add TX connectivity: from AP MLD, TX, after SN assignment and before PN assignment to affiliated AP TX, after SN assignment and before PN assignment; labelled "dissemination" or similar. And is anything required for RX? | **Revised**  Disagree in principle with the comment. The intention of Figure 5-2b is indeed to cover only the case of individually addressed frames. Proposed resolution is to add “for individually addressed frames” in Figure 5-2b to clarify the diagram applies only to individually addressed frames. For group addressed frames please refer to the rules that are defined in 35.3.15.  **TGbe Editor: Please add “for individually addressed frames” to the end of the Figure 5-2b caption.** |
| 23150 | Brian Hart | 5.1.5.1 | 81.48 | "but handle …, and handle" is unclear. Also the whole sentence doesn't parse properly. | Try something like "The affiliated APs’ upper MAC sublayer components are the same as those for the AP MLD, except a) the TTLM and link merging functions simplify to a direct connection, b) group addressed security associations (GTK, IGTK, and BIGTK) are per link and c) traffic to and from associated non-AP non-MLO STAs use single link security associations ..." and then insert "for pairwise transient keys (PTKs)" where-ever it was intended(???) (under c) or perhaps also b) via "in place of pairwise transient keys (PTKs)" ... or something). | **Revised**  Agree in principle. Reorganized the sentence, removing “handle” to improve readability.  See the proposed changes tagged as (#23150) in this document to address this CID.  **TGbe Editor: please apply the changes tagged as (#23150) in this CR.** |
| 23154 | Brian Hart | 5.1.5.1 | 81.15 | This is an evolution of CID 22291 that only partially addressed the concerns raised. It is misleading to say "The MAC data plane architecture with n links (i.e., processes that involve transport of all or part of an MSDU) is shown in Figure 5-2a." since that figure only addresses individually addressed MSDUs. | 1) Add "For individually addressed links" in this sentence; 2) create a companion figure to 5-2a for group addressed links plus some corresponding description. | **Revised**  For 1), see the proposed changes tagged as (#23154) in this document to address this this, which proposes to add “for individually addressed Data frames” to the cited sentence.  For 2), no technical issues have been identified since the normative requirements of group addressed frames are captured in 35.3.15 MLO group addresses frames.  **TGbe Editor: please apply the changes tagged as (#23154) in this CR.** |
| 23160 | Brian Hart | 5.1.5.1 | 83.64 | This is an evolution of CID 22291 that only partially addressed the concerns raised. During discussion it was agreed that an AP MLD does not \*distribute\* group addressed frames to affiliated APs, since "distribution" is a well-defined DS service (see 4.4.4/4.5.2.1) and the AP MLD is not using that service. Rather the term "disseminates" was proposed (and makes reasonable sense; another option is "transfers"). However, "distributing" is still used here. (A similar issue appears at P83L37 and L57 but is perhaps tolerable since it is in regard to MPDUs rather than MSDUs; even so L59/60 say "delivered".) | Change "distributing" to disseminating" at P83L63. Change "transferred" to "disseminated" at P84L5. (Or use "transferring/transferred" for all three). Recommend changing "distribution/distributed" to "delivery/deliver" at P83L36 and L56. | **Revised**  Agree in principle.  Change "distributing" to “disseminating" at P83L63. Change "transferred" to "disseminated" at P84L5.  **TGbe Editor: please apply the changes listed above for this CID.** |

***TGbe editor: please modify section 5.1.5.1 as follows for CID #23150:***

For an AP MLD to support group addressed transmissions and also associations from non-MLD non-AP STAs, Figure 5-2a (MAC data plane architecture (MLO) for individually addressed Data frames) is combined with *n* affiliated APs, within a structure as shown in Figure 4-33c (High level structure for AP MLD with affiliated APs). The affiliated APs’ upper MAC sublayer components are mostly the same as those for the AP MLD except that:

a) the TTLM and link merging functions are not present

b) the group addressed security associations (GTK, IGTK, and BIGTK) are per link and

c) the cryptographic encapsulation of the traffic to and from the associated non-AP STAs (not in MLO) uses the pairwise transient keys (PTKs) established using the single link security associations.

The overall structure is as shown in Figure 5-2b (MAC data plane architecture for AP MLD and affiliated APs).

***TGbe editor: please modify section 5.1.5.1 as follows for CID #23150:***

For MLO, one or more links are used for communication between the AP MLD and non-AP MLD after MLD (re)setup as described in 35.3.5 (ML (re)setup). The MAC data plane architecture with *n* links (i.e., processes that involve transport of all or part of an MSDU) for individually addressed Data frames is shown in Figure 5-2a (MAC data plane architecture (MLO) for individually addressed Data frames)).

***TGbe editor: please modify section 9.4.2.325 (QoS Characteristics element) as follows for CID #23041:***

* + - 1. **QoS Characteristics element**

The QoS Characteristics element contains a set of parameters that define the characteristics and QoS expec- tations of a traffic flow, in the context of a particular non-AP EHT STA, for use by the EHT AP and the non- AP EHT STA in support of QoS traffic transfer using the procedures defined in 11.25.2 (SCS procedures) and 35.8 (Restricted TWT (R-TWT)).

The QoS Characteristics element format is defined in [Figure 9-1001au (QoS Characteristics element for-](#_bookmark260) [mat)](#_bookmark260).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element ID  Extension | Control Info | Minimum Service Interval | Maximum Service Interval | Minimum Data Rate |

Octets: 1 1 1 4 4 4 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Delay Bound | Maximum MSDU  Size | Service Start Time | Service Start Time LinkID | Mean Data Rate | Delayed Bounded Burst Size | MSDU  Lifetime |

Octets: 3 0 or 2 0 or 4 0 or 1 0 or 3 0 or 4 0 or 2

Octets: 0 or 1 0 or 2

Medium Time Information

MSDU

Delivery Info

**Figure 9-1001au—QoS Characteristics element format**

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B11 | B12 B14 | B15 |
|  | Medium Time | Bandwidth | Reserved |
| Bits: | 12 | 3 | 1 |
| Figure 9-1002xx – Medium Time Information field format | | | |

[…]

The Medium Time Information field is present only if the Direction subfield is set to 2 (Direct link) and contains the Medium Time subfield and the Bandwidth subfield..

The Medium Time subfield contains an unsigned integer that specifies the medium time, in units of 256 micro- seconds per second, requested by the STA for direct link transmissions on the link corresponding to the LinkID subfield, and is expressed as the average medium time needed in each second for exchanging frames using the bandwidth indicated in the Bandwidth subfield of the Medium Time Information field. The four MSBs of the Medium Time field are reserved. The values 0, 3906 to 4095 are reserved.

The Bandwidth subfield indicates the bandwidth the STA expects to use, for the specified medium time, for direct link transmissions on the link corresponding to the LinkID subfield. The Bandwidth subfield is encoded as shown in Table 9-y (Bandwidth subfield encoding). The total resource requested is the product of the medium time (in microseconds) and bandwidth (in MHz).

NOTE 1 — If the actual bandwidth that is allocated to the STA is half of the bandwidth specified in the Bandwidth subfield then the allocated medium time needs to be double that of the Medium Time subfield to maintain the same medium time bandwidth product.

Table 9-y — Bandwidth subfield encoding

|  |  |
| --- | --- |
| Value | Meaning |
| 0 | 20 MHz |
| 1 | 40 MHz |
| 2 | 80 MHz |
| 3 | 160 MHz |
| 4 | 320 MHz |
| 5 to 7 | Reserved |

[…]

***TGbe editor: please modify section 35.17 (EHT SCS procedure) as follows for CID #23041:***

35.17 EHT SCS procedure

[…]

The QoS Characteristics element is a reference for the EHT AP’s scheduling. An EHT AP should schedule transmission of downlink frames such that the delay bound and minimum data rate requested are met for the downlink Data frames if the Direction subfield of the QoS Characteristics element indicates downlink. An EHT AP should enable the transmission of uplink frames from the EHT STA with an interval that falls between the requested minimum and maximum service intervals and the AP should meet the minimum data rate requested if the Direction subfield of the QoS Characteristics element indicates uplink. An EHT AP should enable the transmission of direct link frames from the EHT STA to another STA on the link specified in the LinkID subfield of the Control Info field with an interval that falls between the requested minimum and maximum service intervals. The EHT AP should meet the medium time and bandwidth product requested if the Direction subfield of the QoS Characteristics element indicates direct link.

===============================================================================

Do you agree to the resolution provided in doc 11-24/1043r0 for the following CIDs?

23002, 23041, 23149, 23150, 23154, 23160