IEEE P802.11
Wireless LANs

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| Resolution for CID related to 35.3.8 BSS parameter critical update procedure |
| Date: 2021-03-25 |
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Abstract

This document proposes resoulution for CID 2440 related 35.3.8 BSS parameter critical update procedure.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Added nontransmitted BSSID case and referred 11be D1.0

***TGbe editor: Please note that baseline is 11be D1.0***

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** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 2440 | 137/52 | 35.3.8 | An AP may provide critical update information in an unsolicited broadcast ML Probe Response frame so that most clients are able to receive the updates and suppress their ML Probe Request to receive the update. | Please design a method to provide the critical update information when the critical update event is occurred on the AP. | **Revised**The Unsolicited PRCU (Unsolicited Probe Responses for Critical Update) Flag subfield was added to the Capability information field (Figure 9-85). An AP of an AP MLD sets the Unsolicited PRCU Flag subfield to 1 when a critical update occurs to any of elements for any AP on the same AP MLD. Otherwiese the AP sets the subfield to 0.The AP that indicates the Unsolicited PRCU subfield is set to 1 in the Beacon frame shall send unsolicited broadcast Probe Respnose frame(s) including the updated BSS parameters for the AP that the critical update occured until (and including) the next DTIM Beacon frame on the link that the AP is operating on.Also, if a non-AP STA of non-AP MLD receives the Beacon frame or Probe Response frame it transmits the Unsolicited PRCU Flag is set to 1, the non-AP STA shall not send Probe Request frame until next DTIM Beacon frame to avoid probe strom that could arise with the critical update event.**TGbe editor please implement changes as shown in doc 11-21/0501 tagged as 2440.** |

1. **Proposed spec text**

**9.4.1.4 Capability Information field**

***TGbe editor: Change Figure 9-85 (Capability Information field format (non-DMG STA)) as follows (#2440):***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 | B5 | B6 | B7 |
|  | ESS | IBSS | Reserved | Reserved | Privacy | Short Preamble | Critical Update Flag | Unsolicited PRCUFlag |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B8 | B9 | B10 | B11 | B12 | B13 | B14 | B15 |
|  | SpectrumManagement | QoS | Short Slot Time | APSD | Radio Measurement | EPD | Resrerved | Reserved |

Figure 9-85—Capability Information field format (non-DMG STA)

***TGbe editor: Please insert the following paragraphs after the last paragraph of section 9.4.1.4 and before the NOTE:***

(#2440) The Unsolicited Probe Response for Critical Update (PRCU) Flag subfield is reserved except when the Capability Information field is carried in a Beacon or a Probe Response frame transmitted by an AP affiliated with an AP MLD.

(#2440) An AP affiliated with an AP MLD sets the Unsolicited PRCU Flag subfield to 1 if the Critical Update Flag is set to 1 and the AP has schedule for transmission an unsolicited broadcast Probe Response frame carrying any of the elements with respect to critical updates. In this case, the AP follows the rules defined in 35.3.8 (BSS parameter critical update procedure). Otherwise, the AP sets the subfield to 0.

(#2440) NOTE – An AP operating in 6 GHz can send an unsolicited broadcast Probe Response frame every 20 TU as defined in 26.17.2.3.2 (AP behavior for fast passive scanning). Such an AP can include the critical update information, if any, in the transmitted unsolicited broadcast Probe Response frame.

NOTE—An AP sets the Critical Update Flag value and Unsolicited PRCU Flag value to 1 in one or more Beacon frames or Probe Response frames by following the procedure defined in 35.3.8 (BSS parameter critical update procedure).

***TGbe editor: Please modify the clause 35.3.8 as shown below (Track Changes ON):***

**35.3.8 BSS parameter critical update procedure**

If an AP affiliated with an AP MLD is not in a multiple BSSID set or the AP corresponds to a transmitted BSSID in a multiple BSSID set, the AP shall

* include in the Beacon and Probe Response frames it transmits a BSS Parameters Change Count subfield for each of all APs affiliated with the same AP MLD as the AP.
* The BSS Parameters Change Count subfield value for each AP is initial­ized to 0, and shall be incremented (modulo 256) when a critical update occurs to the operational parameters for that AP as defined in 11.2.3.15 (TIM Broadcast).
* The BSS Parameters Change Count subfield for each of other APs affiliated with the AP MLD shall be carried in the MLD Parameters subfield in the TBTT Information field of the Reduced Neighbor Report element corresponding to that AP.
* The BSS Parameters Change Count subfield for the AP shall be carried in the Common Info field of the Basic variant Multi-Link element.
* provide in the Critical Update Flag subfield of the Capability Information field (9.4.1.4 (Capability Information field)) of the Beacon and Probe Response frames it transmits an indication of an update to the value carried in the BSS Parameters Change Count subfield of the MLD Parameters field in the Reduced Neighbor Report element for any AP affiliated with the same AP MLD as the AP or the value carried in the BSS Parameters Change Count subfield in the Common Info field of the Basic variant Multi-Link element.
* Set the Critical Update Flag subfield of the Capability Information field to 1 in the Beacon frame(s) until and including the next DTIM Beacon frame on the link on which the AP is operat­ing if there is a change to a value carried in the BSS Parameters Change Count subfield of the MLD Parameters field in the Reduced Neighbor Report element for any AP in the same AP MLD as the AP or a value carried in the BSS Parameters Change Count subfield in the Common Info field of the Basic variant Multi-Link element.
* Otherwise set the Critical Update Flag subfield of the Capability Information field to 0.
* (#2440) provide in the Unsolicted PRCU Flag subfield of the Capability Information field defined in 9.4.1.4 (Capability Information field) of the Beacon and Probe Response frames it transmits an indication of its intent to transmit an unsolicited Probe Response frame for critical update for any AP affiliated with the same AP MLD as the AP.
* Set the Unsolicted PRCU Flag subfield of the Capability Information field to 1 in the Beacon frame(s) until and including the next DTIM Beacon frame on the link on which the AP is operat­ing if there is a change to a value carried in the BSS Parameters Change Count subfield of the MLD Parameters field in the Reduced Neighbor Report element for any AP in the same AP MLD as the AP or a value carried in the BSS Parameters Change Count subfield in the Common Info field of the Basic variant Multi-Link element.
* Otherwise set the Unsolicted PRCU Flag subfield of the Capability Information field to 0.

(#2440) If an AP affiliated with an AP MLD is not in a multiple BSSID set or the AP corresponds to a transmitted BSSID in a multiple BSSID set, the AP that sets the Unsolicited PRCU Flag subfield to 1 in the Beacon frame(s) and the Probe Response frame(s) it transmits shall send one or more ML probe response(s) that sets Address 1 field to broadcast address before it transmits the Beacon frame where the Unsolicited PRCU Flag sets to 0. The Probe Response frame carries a Basic variant Multi-Link element that contains one or more Per-STA Profile subelement(s) corresponding to the reported AP(s) in the same AP MLD as the AP where the critical update occurred, each of which Per-STA Profile subelement contains at least the element(s) changed from the most recent critical updates.

If an AP affiliated with an AP MLD is a nontransmitted BSSID in a multiple BSSID set, then the AP that corresponds to the transmitted BSSID in the same multiple BSSID set shall

* include in the Beacon and Probe Response frames it transmits a BSS Parameters Change Count subfield for each of all APs affiliated with the same AP MLD as the AP corresponding to the non-transmitted BSSID
* The BSS Parameters Change Count subfield value for each AP is initial­ized to 0, and shall be incremented (modulo 256) when a critical update occurs to the operational parameters for that AP as defined in 11.2.3.15 (TIM Broadcast).
* The BSS Parameters Change Count subfield for each of other APs affiliated with the AP MLD shall be carried in the MLD Parameters subfield in the TBTT Information field of the Reduced Neighbor Report element corresponding to that AP.
* The BSS Parameters Change Count subfield for the nontransmitted BSSID shall be carried in the Common Info field of the Basic variant Multi-Link element carried in Nontrans­mitted BSSID Profile subelement of the Multiple BSSID element.
* provide in the Critical Update Flag subfield of the Nontransmitted BSSID Capability element (for that nontransmitted BSSID) an indication of an update to the value carried in the BSS Parameters Change Count subfield of the MLD Parameters field in the Reduced Neighbor Report element for any AP affiliated with the same AP MLD as the AP corresponding to the nontransmitted BSSID or a value carried in the BSS Parameters Change Count subfield in the Common Info field of the Basic variant Multi-Link element in the Nontransmitted BSSID Profile corresponding to the nontransmitted BSSID
* Set the Critical Update Flag subfield of the Capability Information field to 1 in the Beacon frame(s) until and including the next DTIM Beacon frame of the nontransmitted BSSID if there is a change to a value carried in the BSS Parameters Change Count subfield of the MLD Param­eters field in the Reduced Neighbor Report element for any AP in the same AP MLD as the AP corresponding to the nontransmitted BSSID or a value carried in the BSS Parameters Change Count subfield in the Common Info field of the Basic variant Multi-Link element in the Non­transmitted BSSID Profile corresponding to the nontransmitted BSSID.
* Otherwise, set the Critical Update Flag subfield of the Capability Information field to 0.
* (#2440) provide in the Unsolicited PRCU Flag subfield of the Nontransmitted BSSID Capability element (for that nontransmitted BSSID) of the Beacon and Probe Response frames it transmits an indication of its intent to transmit an unsolicited Probe Response frame for critical update for any AP affiliated with the same AP MLD as the AP corresponding to the nontransmitted BSSID.
* Set the Unsolicited PRCU Flag subfield of the Capability Information field to 1 in the Beacon frame(s) until and including the next DTIM Beacon frame of the nontransmitted BSSID if there is a change to a value carried in the BSS Parameters Change Count subfield of the MLD Parameters field in the Reduced Neighbor Report element for any AP in the same AP MLD as the AP corresponding to the nontransmitted BSSID or a value carried in the BSS Parameters Change Count subfield in the Common Info field of the Basic variant Multi-Link element in the Nontransmitted BSSID Profile corresponding to the nontransmitted BSSID.
* Otherwise, set the Critical Update Flag subfield of the Capability Information field to 0.

(#2440) If an AP affiliated with an AP MLD is a nontransmitted BSSID in a multiple BSSID set, then the AP that corresponds to the transmitted BSSID in the same multiple BSSID set and that sets the Unsolicited PRCU Flag subfield to 1 in the Beacon frame(s) and the Probe Response frame(s) it transmits shall send one or more ML probe response(s) that sets Address 1 field to broadcast address before it transmits the Beacon frame where the Unsolicited PRCU Flag sets to 0. The Probe Response frame carries a Basic variant Multi-Link element in a nontransmitted BSSID profile of a Multiple BSSID element that contains one or more Per-STA Profile subelement(s) corresponding to the reported AP(s) in the same AP MLD as the AP which is the nontransmitted BSSID where the critical update occurred, each of which Per-STA Profile subelement contains at least the element(s) changed from the most recent critical updates.

(#2440) If a non-AP STA affiliated with a non-AP MLD receives a Beacon frame or Probe Response frame in which the Unsolicited PRCU Flag equal to 1 from an AP MLD with which the non-AP MLD has performed a multi-link setup, the non-AP STA should not send any Probe Request frame to retrieve the updated BSS parameters before it receives the Beacon frame or Probe Response frame where the Unsolicited PRCU Flag sets to 0.

A non-AP MLD shall maintain a record of the most recently received BSS Parameters Change Count subfield value for each AP in the AP MLD with which it has multi-link setup.