IEEE P802.11
Wireless LANs

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| TBD and CR for BSS parameter critical update procedure |
| Date: Mar 20, 2021 |
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 Abstract

This submission proposes resolutions for following 21 CIDs received for TGbe CC34:

1067 1691 1068 1069 1070 1201 1202 1071 2431 1200 1231 1498 1692 2130 2300 2599 3030 3225 2131 3240 3319

And fix TBD in clause 35.3.8 BSS parameter critical update procedure

Revisions:

* Rev 0: Initial version of the document.
* Rev 1 and 2: Change based on the received comments

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 | Page | Clause | Comment | Proposed Change | Resolution |
| 1067 | Abhishek Patil | 137.24 | 35.3.8 | Fix the TBD - define the container (field) to carry change sequence value for transmitting AP | As in comment | Revised-Agree with the comment and proposed resolution addresses this TBDTGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1067  |
| 1691 | GEORGE CHERIAN | 137.24 | 35.3.8 | "The Change Sequence field for the AP shall be carried in the TBD field."Define the TBD field | As in the comment | Revised-Agree with the comment. Propose resolution to account for the TBDTGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1691 |
| 1068 | Abhishek Patil | 137.18 | 35.3.8 | There are frequent references in the spec to the change sequence value for the transmitting (reporting) AP and that of the reported AP. Furthermore, these fields will be carried within the same frame (such as Beacon frame). In order to differentiate between the two cases, the spec must provide distinct name for the two fields. | For the reporting AP, name the field as: "Reporting AP Change Count". For the reported AP, name the field as "Reported AP Change Count". Delete the following sentence on P137L41: "The name and format of the Change Sequence field are TBD." | Revised-Agree with the comment in principal, change "Change Sequence" to “Change Count” to avoid the same terminology (Change Sequence subfield in the Change Sequence element for SIG STA) in 802.11 REVmd D5.0TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1068 and change "Change Sequence" to “BSS Parameters Change Count” through the 802.11 be draft. |
| 1069 | Abhishek Patil | 137.33 | 35.3.8 | There are several long sentences describing different cases and conditions under which certain rules apply. The long sentences are harder to follow and are error prone. | Split the long sentences into smaller ones to address each condition and case separately. It will also help to separately address the MBSSID cases | Revised-Agree with the comment and rephrase several paragraphsTo TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1069 |
| 1070 | Abhishek Patil | 137.33 | 35.3.8 | Define the size of the container for carrying the change sequence value. [Fixes 3 TBDs] | Define the size of Change Sequence field to be 1 octet - consistent with Check Beacon field of TIM frame (11.2.3.15). | Revised-Agree with the comment and proposed resolution addresses this TBDTo TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1070 |
| 1201 | Arik Klein | 137.34 | 35.3.8 | Need to clarify in which frame of the AP the elements in the following sentence refer to "An AP within an AP MLD shall increase the value (modulo TBD maximum value) of the Change Sequence field for the AP when a critical update occurs to any of the \*elements for the AP\*"? | Please change the unclear term "elements for the AP" to "elements included in Beacon or Probe Response frames transmitted by the AP" | Revised-Agree with the comment. Rephrase the paragraphs to make it clearTGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1201 |
| 1202 | Arik Klein | 137.36 | 35.3.8 | Need to clarify in which frame of the AP the elements in the following sentence refer to "An AP within an AP MLD shall increase the value (modulo TBD maximum value) of the Change Sequence field for another AP in the same AP MLD when a critical update occurs to \*any of the elements for that AP\*"? | Please change the unclear term "elements for that AP" to "elements included in Beacon or Probe Response frames transmitted by that AP" | Revised-Agree with the comment. Rephrase the paragraphs to make it clearTGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1202 |
| 1071 | Abhishek Patil | 137.41 | 35.3.8 | It is obvious that TGbe will add at least EHT Op IE to the list in clause 11.2.3.15. | Delete: "and the TBD additional update can be added" | Revised-Agree with the comment and proposed resolution addresses this TBDTo TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1071 |
| 2431 | namyeong kim | 137.40 | 35.3.8 | We need to update clarify the elements which are claasified as critical update events in 11be. | Please clarify elements which are classified critical update event in 11be and add them in section 11.2.3.15. | Revised-Add more critical update events for 11be into the section 11.2.3.15TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 2431 |
| 1200 | Arik Klein | 137.24 | 35.3.8 | According to TGbe D0.3, the Change Sequence field will be used to indicate changes in elements in Beacon frame and Probe response frames for all APs affiliated with AP MLD.In 802.11ax D8.0 such changes are indicated in "Check Beacon" field for critical changes in elements of Beacon frame, as descrived in 11.2.3.15.Need to clarify if the Beacon Check field is still required to be updated or is it replaced by the Change Sequence field. | 1. Add a note if "Check Beacon" field is also updated in addition to Change Sequence field update or not.2. Add a note in section 11.2.3.15 if in an update in any of the new EHT elements (such as: EHT Operation element, etc.) is done using Beacon check field or only by change Sequence field | 　 |
| 1231 | Arik Klein | 137.54 | 35.3.8 | Use unified terminology of non-AP affiliated with non-AP MLD rather than non-AP within non-AP MLD, as in the sentence: "A non-AP STA within a non-AP MLD may decode the Critical Update Flag subfield in the Capability Information field " | The revised sentence shall be "A non-AP STA affiliated with a non-AP MLD may decode the Critical Update Flag subfield in the Capability Information field" | Revised-Agree with the comment. Change all the related terms in this subclause to “affliated with”TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 1231 |
| 1498 | Dibakar Das | 137.41 | 35.3.8 | A change to an existing Broadcast TWT element may also count as a critical update | Include the following event as a critical update: modification of a Broadcast TWT element that is allocated for EHT low latency services | Rejected-The event- Insertion of a Broadcast TWT element is classified as a critical event. Regarding modification, since target wake up time for the same broadcast TWT in each Beacon is changed, it is not needed to classify this as critical event.  |
| 1692 | GEORGE CHERIAN | 137.54 | 35.3.8 | "A non-AP STA within a non-AP MLD may decode the Critical Update Flag subfield in the Capability Information field."Define also the action, after the non-AP MLD decodes the flag ("such as checking the RNR IE to determine which AP has updated its BSS Parameter(s)) | As in the comment | Revised-Agree with the comment, and the action that commenter mentioned was added by 21-0399/r2TGbe editor No further changes are needed to address this comment. |
| 2130 | Laurent Cariou | 0.00 | 35.3.8 | In paragraph starting with "An AP within an AP MLD shall increase", make sure all cases are covered | as in comment | Revised-The case for non-transmitted BSSID which is affilaited with an MLD was added by 21-0056/r3. TGbe editor No further changes are needed to address this comment. |
| 2300 | Michael Montemurro | 137.15 | 35.3.8 | For traditional APs and STAs, these procedures are related to primitives such as MLME.join or MLME.start. For MLD, it would be good to add new primitives to alllow the MLD AP and affiliated APs to update their parameters for critical update.. | Add primitives to update critical parameters and provide text in this sub-clause to explain the processing for MLDs. | Rejected-. The critical update feature is defined in the base standard. TGbe extends the feature requirements to support MLO. The base standard does not include primitives for critical updates so the Proposed Change really should take place in REVme, not TGbe |
| 2599 | Rojan Chitrakar | 137.26 | 35.3.8 | What about the Change Sequence field for the other APs of a second AP MLD with which the nontransmitted BSSID is affiliated, if the second AP MLD is different from the AP MLD with which the transmitted BSSID is affiliated with? Shouldn't they be included in the Beacon and Probe Response frames as well? | Clarify whether the Change Sequence field for the other APs of a second AP MLD with which the nontransmitted BSSID is affiliated, if the second AP MLD is different from the AP MLD with which the transmitted BSSID is affiliated with are also included in the Beacon and Probe Response frames. | Revised-It is needed for the Change Sequence field for the other APs of a second AP MLD with which the nontransmitted BSSID is affiliated and this case was added by 21-0056/r3. TGbe editor No further changes are needed to address this comment. |
| 3030 | Xiaofei Wang | 137.43 | 35.3.8 | The note is about format and should be removed | as in comment | Accepted- |
| 3225 | Young Hoon Kwon | 137.28 | 35.3.8 | What is a nontransmitted BSSID is not a member of any MLD? Do we still need to carry change sequence for this nontransmitted BSSID? Clarification is needed. | As shown in the comment. | Revised-If the nontransmitted BSSID is not affiliated with an MLD, then this Change Sequence field is not needed. Delete the corresponding description.TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 3225 |
| 2131 | Laurent Cariou | 0.00 | 35.3.8 | Do we need the following sentence: A non-AP STA within a non-AP MLD may decode the Critical Update Flag subfield in the CapabilityInformation field. | as in comment | Revised-Agree with the comment, delete the cited sentence. On the other hand, the action that commenter mentioned was added by 21-0399r4TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 2131 |
| 3240 | Young Hoon Kwon | 137.54 | 35.3.8 | I don't see any meaningful implication of this sentence. Please rephrase it or delete it. | As shown in the comment. | Revised-Agree with the comment, delete the cited sentence. On the other hand, the action that commenter mentioned was added by 21-0399r4TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 3240 |
| 3319 | Yunbo Li | 137.53 | 35.3.8 | A non-AP STA within a non-AP MLD may decode the Critical Update Flag subfield in the Capability Information field. | Do we need this sentence? Delete? | Revised-Agree with the comment, delete the cited sentence. On the other hand, the action that commenter mentioned was added by 21-0399r4TGbe editor Please implement changes as shown in doc 11-21/0621r2 tagged as 3319 |

***TGbe editor: Please note baselines are REVmd D5.0, 11ax D8.0 and 11be D0.4***

**35.3.8 BSS parameter critical update procedure**

***TGbe editor: Please update the subclause as shown below*** 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 (#CID 1068) for each of all APs affiliated with the same AP MLD as the AP. (#CID 1231)

* 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). (#CID 1070, 1201, 1202)
* The BSS Parameters Change Count subfield (#CID 1068) 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 (#CID 1068) for the AP shall be carried in the Common Info field of the Basic variant Multi-Link element. (#CID 1067, 1691)

—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 to 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 (#CID 1069)

 (#CID 3225)

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: (#CID 1231)

* 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). (#CID 1070, 1201, 1202)
* 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. (#CID 1067, 1691)

—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 non-transmitted 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 non-transmitted 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 (#CID 1069)

 (#CID 1069)(#CID 1070, 3030) (#CID 1069) (#CID 2131, 3240, 3319)A non-AP MLD shall maintain a record of the most recently received BSS Parameters Change Count subfield (#CID 1068) value for each AP in the AP MLD with which it has multi-link setup.

**11.2.3.15 TIM Broadcast**

The AP shall increase the value (modulo 256) of the Check Beacon field in the next transmitted TIM frame(s) when a critical update occurs to any of the elements inside the Beacon frame.

The following events about the operational parameters of the AP shall classify as a critical update:

a) Inclusion of a Channel Switch Announcement element

b) Inclusion of an Extended Channel Switch Announcement element

c) Modification of the EDCA parameters element

d) Inclusion of a Quiet element

e) Modification of the DSSS Parameter Set

f) Modification of the CF Parameter Set element

g) Modification of the HT Operation element

h) Inclusion of a Wide Bandwidth Channel Switch element

i) Inclusion of a Channel Switch Wrapper element

j) Inclusion of an Operating Mode Notification element

k) Inclusion of a Quiet Channel element

l) Modification of the VHT Operation element

m) Modification of the HE Operation element

n) Insertion of a Broadcast TWT element

o) Inclusion of the BSS Color Change Announcement element

p) Modification of the MU EDCA Parameter Set element

q) Modification of the Spatial Reuse Parameter Set element

r) Modification of the UORA Parameter Set element

t) Modification of the EHT Operation element (#CID 1071, 2431)

NOTE—Modification of an element means that at least one value of a field in the element is changed. Inclusion of an element means that the element is included in a Beacon frame. The Insertion of an element means that the element was not present in the previous Beacon frame and is present in the current Beacon frame will be carried in the next Beacon frame.