IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB266 – CR for CIDs related to 35.3.11 | | | | |
| Date: 2022-08-15 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Laurent Cariou |  |  |  | laurent.cariou@intel.com |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 10644 | 35.3.11 | 436.10 | Instead of 'for itself' suggest using same language as other clause - i.e., '... elements outside the Basic Multi-Link element ... | As in comment | Accept |
| 11744 | 35.3.11 | 436.10 | There is definition for an 'affected AP' but it is used quite liberally throughout 35.3.11 subclause. Insert an initial paragraph defining an 'affected AP'. | as in comment | Revised – agree with the commenter. Add a sentence at the beginning of the subclause to clarify the meaning of affected AP in this subclause. Apply the changes marked as #11744 in this document. |
| 11967 | 35.3.11 | 436.10 | Please clarify whether Channel Switch Announcement frame may carry Multi-link Link Id element | If the legacy STAs limit the CSA may be transmitted only in the link that is changing, then this should be written more clearly in the spec. | Revised – clarify the CSA frames can be broadcasted on the affected link only. Apply the changes marked as #11967 in this document. |
| 10489 | 35.3.11 | 436.11 | It seems like "affected AP" is a new type of AP. Define "affected AP" | as in comment | Revised – agree with the commenter. Add a sentence to clarify the meaning of affected AP in this subclause. Apply the changes marked as #10489 in this document. |
| 11568 | 35.3.11 | 436.11 | If following the style of the spec for other sections e.g., "(Reporting A)" following AP, then "(affected) AP" should be "AP (affected AP)". | as in comment | Accept |
| 12939 | 35.3.11 | 436.11 | In Multi-link procedures for channel switching, extended channel switching, and channel quieting there is a mention only of Beacon and Probe Response frames. But Channel Switch Announcement element and Extended Channel Switch Announcement element can also be included in Channel Switch Announcement frame and Extended Channel Switch Announcement frame respectively. It may be important to mention these frames if the Channel Switch Count is initially 1, because in this case the switch occurs immediately before the next TBTT, or initially 0, because in this case the switch occurs any time. | Add a mention of Channel Switch Announcement frame and Extended Channel Switch Announcement frame in Multi-link procedures for channel switching, extended channel switching, and channel quieting. | Revised – clarify the CSA frames are only transmitted on the affected link. Apply the changes marked as #12939 in this document. |
| 11120 | 35.3.11 | 436.12 | It would be more helpful if CSA or CSA-like information was sent on non-switching affiliated APs until the switching AP was live on a channel since then, if the switching AP was hunting for a radar-free DFS channel and failing and failing before ultimately succeeding, then the non-switching affiliated APs could report the latest target operating class, channel and expected start time on the new target operating class and channel. Also, newly arriving clients can see the existence of the switching AP mid-switch. | Especially if an AP advertises a large Max Channel Switch Time with its CSA, once that has counted down to zero (start of switch), allow non-switching affiliated APs to advertise a new CSA for the AP. By reducing the Max Channel Switch Time to zero with the CSA Channel Switch Count equal to zero, the non-switching AP can identify when the switching AP will restart operations on the new channel (i.e., the end of the switch). Also, if the target operating class/channel of the switching AP changes, or the time of the end of the switch changes, then allow the non-switching affiliated APs to report this too. Note that the ultimate operating class/channel might be the starting operating class and channel if the AP couldn't find a DFS channel free of radar. | Revised – agree with the commenter. Channel change is handled by the RNR rules. Max Channel Switch time can also be transmitted on the other link and can be changed if there is a need for a second channel change for instance. As such all is sort of supported right now, but needs clarification. Add a note to clarify this. Apply the changes marked as #11120 in this document. |
| 11437 | 35.3.11 | 436.13 | When the new channel is wider than 20 MHz, the affected AP is required to also carry the Wide Bandwidth Channel Switch element. Without this element, the receiving STA is not aware of the BW on the new channel. The list here does not include the Wide Bandwidth Channel Switch element. Either include that to the list or specify the non-AP behavior. | As in comment | Reject – The Wide Bandwidth Channel Switch element is included as a subelement in the Extended Channel Switch element, so there is no need to include it in the beacon. The STA behavior is already clear on that in baseline. |
| 10490 | 35.3.11 | 436.23 | "then one of the followings shall apply:" I don't think this logic works with a single AP affiliated with an AP MLD and not an MBSSID. | as in comment | Revised – modify the sentence to add a condition that the other APs are affiliated with the same AP MLD. Apply the changes marked as #10490 in this document. |
| 11260 | 35.3.11 | 436.23 | Change "one of the followings" to "one of the following" | See comment | Accept |
| 11438 | 35.3.11 | 436.23 | Typo: 'followings' --> 'following' | As in comment | Accept |
| 11745 | 35.3.11 | 436.23 | Replace "followings" with "following". | as in comment | Accept |
| 11746 | 35.3.11 | 436.24 | Bullets on P436:L24 and P436:L30 do not address the case where there is single AP in an AP MLD case and no other APs. | as in comment | Revised – agree with the commenter. Modify the sentence to add this condition that there is additional APs in the AP MLD. Apply the changes marked as #11746 in this document. |
| 10645 | 35.3.11 | 436.25 | Per 35.3.2, under normal circumstances, a Beacon and (non-ML) Probe Response frame doesn't include Per-STA Profile subelement to keep the frame from being too large. Therefore, revise the bullet as follows: "... shall include the Per-STA Profile subelement, corresponding to the affected AP, in the Basic Multi-Link element which is carried in the Beacon frame and Probe Response frame that it transmits and the STA Profile field of the subelement shall carry the corresponding element(s) in the STA Profile field of the Per-STA Profile subelement corresponding to the affected AP."  Apply the same change to the paragraph below for nonTxBSSID. | As in comment | Reject - I understand the intention of the commenter. However, there is nothing wrong with the current wording and the new wording would seriously complicate the understanding of the sentence for the other cases. And it is clear elsewhere in the spec that the Per-STA Profile is otherwise not present. |
| 10646 | 35.3.11 | 436.31 | Per 35.3.2, under normal circumstances, a Beacon and (non-ML) Probe Response frame doesn't include Per-STA Profile subelement to keep the frame from being too large. Therefore, revise the bullet as follows: "... shall include the Per-STA Profile subelement, corresponding to the affected AP, in the Basic Multi-Link element, corresponding to the AP MLD, which is carried in the nontransmitted BSSID profile, corresponding to the reporting AP, in the Multiple BSSID element which is included in the Beacon frame and Probe Response frame that it transmits and the STA Profile field of the subelement shall carry the corresponding element(s) in the STA Profile field of the Per-STA Profile subelement corresponding to the affected AP.  Apply the same change to the paragraph below for nonTxBSSID. | As in comment | Reject - I understand the intention of the commenter. However, there is nothing wrong with the current wording and the new wording would seriously complicate the understanding of the sentence for the other cases. And it is clear elsewhere in the spec that the Per-STA Profile is otherwise not present. |
| 10647 | 35.3.11 | 436.41 | Need to include Max Channel Switch Time element in the bullet on timing.  Apply the same change to the paragraph below for nonTxBSSID. | As in comment | Revised – Max Channel Switch Time has a slightly different parsing so a dedicated note should be added instead. Apply the changes marked as #10647 in this document. |
| 10416 | 35.3.11 | 436.42 | Is the 'BI' the acronym of 'beacon interval'? I do not find the definition of it in clause 3.Please clarify it | please clarify it | Revised – replace BI by Beacon Interval in the subclause. Apply the changes marked as #10416 in this document. |
| 13372 | 35.3.11 | 436.49 | This is not in line with multiple BSSID operation dince the Quiet element, channel switch need to inherited from the transmitted BSSID AP. Delete the part in the paragraph that is not in line with the Multiple BSSID operation. | update the text according to the comment. | Revised – agree with the commenter. The transmitted BSSID will include the elements in the core of the frame and not in the profile, and the nonTx BSSID will inherit these elements. Apply the changes marked as #13372 in this document. |
| 10648 | 35.3.11 | 436.50 | REVme D1.3 clarifies (as a resolution to CID 2189 in doc 11-22/529) that all of these elements are never included in the nonTxBSSID profile and that a nonTxBSSID always inherited these from the TxBSSID, when the TxBSSID's Beacon / Probe Response frame includes any of them. Therefore, delete "in the nontransmitted BSSID profile corresponding to an affected AP in the Multiple BSSID element" and ", or if any of these elements is inherited for the affected AP in these frames". | As in comment | Revised – agree with the commenter. Apply the changes marked as #10648 in this document. |
| 13790 | 35.3.11 | 437.02 | If the AP MLD only has one affiliated AP, then the following will not apply | Add "with more than one AP" after "an AP MLD" | Revised – agree with the commenter. Apply the changes marked as #13790 in this document. |
| 10491 | 35.3.11 | 437.04 | "Another AP (reporting AP) affiliated". Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – agree with the commenter. Apply the changes marked as #10491 in this document. |
| 13917 | 35.3.11 | 437.29 | change "if used for this channel switch" to "if it is included in the Beacon frame sent by the AP" | change "if used for this channel switch" to "if it is included in the Beacon frame sent by the AP" | Revised – agree with the commenter. Apply the changes marked as #13917 in this document |
| 11439 | 35.3.11 | 437.32 | The value carried in the Switch Time field may need to be updated if the affected AP cannot start Beaconing in the new channel. This can happen when the affected AP detects a new radar on the new channel before it can start Beaconing. | Add the following note - 'NOTE - The reporting AP might increase the value carried in the Switch Time field of the Max Channel Switch Time element if the affected AP performs a second channel switch between the target time of a first channel switch and the time at which the affected AP will start beaconing on the new channel corresponding to the first channel switch'. | Accept |
| 10492 | 35.3.11 | 437.38 | "extended channel switch announcement procedure, then:" Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – agree with the commenter. Apply the changes marked as #10492 in this document. |
| 12633 | 35.3.11 | 437.40 | Rephrase the following sentence so that it should first define the value to which the Operating Class and Channel Number fields are set and then defines when this setting occurs | Please revise as follows: "another AP affiliated with the AP MLD shall set the Operating Class and Channel Number fields corresponding to the first AP that is reported in the Reduced Neighbor Report element in Beacon and Probe Response frames it transmits (or that the transmitted BSSID in the same multiple BSSID set as the other AP transmits if the other AP corresponds to a nontransmitted BSSID) to the initial operating class/channel before the target switch time " | Revised – agree with the commenter. Apply the changes marked as #12633 in this document. |
| 12634 | 35.3.11 | 437.46 | Rephrase the following sentence so that it should first define the value to which the Operating Class and Channel Number fields are set and then defines when this setting occurs | Please revise as follows: "another AP affiliated with the AP MLD shall set the Operating Class and Channel Number fields corresponding to the first AP that is reported in the Reduced Neighbor Report element in Beacon and Probe Response frames it transmits (or that the transmitted BSSID in the same multiple BSSID set as the other AP transmits if the other AP corresponds to a nontransmitted BSSID) to the target operating class/channel at and after the target switch time." | Revised – agree with the commenter. Apply the changes marked as #12634 in this document. |
| 12361 | 35.3.11 | 437.51 | Type, remove extra ) in "if the reporting AP corresponds to a nontransmitted BSSID) )at and after the target switch time to the target operating class/channel." | As in comment | Accept |
| 10493 | 35.3.11 | 437.60 | "and another AP (reporting AP) of", Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – agree with the commenter. Add “if any” in the sentence to make an extra condition. Apply the changes marked as #10493 in this document. |
| 14118 | 35.3.11 | 437.63 | " then the other AP (reporting AP) shall include the complete profile for the AP indicating the target operating class/channel and a Max Channel Switch Time element in the per-STA profile corresponding to the AP (affected/reported AP) in the Basic Multi-link element included in the (Re)Association Response frame it sends in response to indicate the time at which the AP (affected/reported AP) will start beaconing, if the (Re)Association Response frame is sent between the last beacon on the initial operating class/channel and the first beacon on the target operating class/channel."  How to indicate target operating class/channel in the association response frame?  How to indicate the starting point of Max Channel Switch Time? | Specify procedures or additional elements in (re)assciation response to: Clarify how does the target channel is signaled in the association response frame  Clarify how to know the starting point of Max Channel Switch Time | Revised – current text in subclause 35.3.11 already points to a modification of the field in order to point to the right value. The text is a bit unclear so suggest to clarify it. Apply the changes marked as #14118 in this document. |
| 10494 | 35.3.11 | 438.06 | "Otherwise, the other AP (reporting AP) shall not include", Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – agree with the commenter. Add “if any” in the sentence to make an extra condition. Apply the changes marked as #10493 in this document. |
| 13374 | 35.3.11 | 438.06 | The "shall not" is difficult to implement since it is difficult to predict the Tx time of the Beacon and Association Response frame | update the text according to the comment. | Revised – replace shall not by should not. Apply the changes marked as #13374 in this document. ?? |
| 13371 | 35.3.11 | 438.09 | In Beacon the Quiet element for r-TWT for reported link is not carried. However the Quiet element for r-TWT for reported link is not excluded from Association Response frame. This is not right. | update the text according to the comment. | Revised – agree with the commenter. Specify what type of quiet element is included and what type not included. Apply the changes marked as #13371 in this document. |
| 10495 | 35.3.11 | 438.13 | "the other AP (reporting AP) shall", Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – agree with the commenter. Add “if any” to the sentence to add an extra condition. Apply the changes marked as #10495 in this document. |
| 10496 | 35.3.11 | 438.17 | "the other AP (reporting AP) shall", Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – agree with the commenter. Add “if any” to the sentence to add an extra condition. Apply the changes marked as #10496 in this document. |
| 13693 | 35.3.11 | 440.10 | It is difficult to distiguish different type of Beacon in Figure 35-14, especially when it is printed on paper. | please redraw the figure. | Reject – there are no different types of beacon. |
| 10497 | 35.3.11 | 440.38 | "only the other link and is", Do we have an issue with a single AP affiliated with an AP MLD? | as in comment | Revised – modify the sentence slightly to mark the extra condition on the existence of another AP affiliated with the same AP MLD. Apply the changes marked as #10497 in this document. |
| 13373 | 35.3.11 | 436.07 | The channel switching rules in 11be D2.0 don't work with channel puncture | update the text according to the comment. | Revised -  Agree with the commenter. The STAs will receive the information for puncturing in the first beacon they receive on the new channel. The procedure for it is already there as for instance the Wide Bandwidth Channel Switch subelement may not be present in the CSA/eCSA elements. Add a Note to clarify that. Apply the changes marked as #13373 in this document. |

1. **Introduction**
2. **Proposed spec text**
   * 1. **Multi-link procedures for channel switching, extended channel switching, and channel quieting**

(#11744, #10489) In this subclause, the term affected AP is used to identify an AP that is subject to channel switching, extended channel switching and channel quieting among all the APs that are affiliated with an AP MLD.

If an (#11568) AP (affected AP) affiliated with an AP MLD includes any of the following (#11967, #12939)applicable elements (#10664)outside the Basic Multi-Link element in the Beacon frame or Probe Response frame (#11967, #12939)or (Extended) Channel Switch Announcement frame it transmits:

* Channel Switch Announcement element
* Extended Channel Switch Announcement element
* Max Channel Switch Time element
* Quiet element corresponding to quiet intervals other than quiet intervals scheduled to protect (#11109)R-TWT SPs (see [35.9.4.2 (Quieting STAs during R-TWT SPs(#10893)(#11109))](#bookmark109))
* Quiet Channel element

then one of the (#11260, #11745) following shall apply (#10490, #11746) if other APs are affiliated with the same AP MLD as the affected AP:

* Another AP (reporting AP) affiliated with the same AP MLD and not corresponding to a nontransmitted BSSID shall carry the corresponding element(s) in the STA Profile field of the Per- STA Profile subelement corresponding to the affected AP contained in the Basic Multi-Link element included in the Beacon frame and Probe Response frame that it transmits.
* An AP corresponding to the transmitted BSSID in the same multiple BSSID set as a nontransmitted BSSID (reporting AP) that is affiliated with the same AP MLD as the affected AP shall carry the corresponding element(s) in the STA Profile field of the Per-STA Profile subelement corresponding to the affected AP contained in the Basic Multi-Link element corresponding to the AP MLD in the nontransmitted BSSID profile corresponding to the reporting AP in the Multiple BSSID element included in the Beacon frame and Probe Response frame that it transmits.

and

* The timing fields in the Channel Switch Announcement element, the Extended Channel Switch Announcement element, the Quiet element, and the Quiet Channel element shall be applied in reference to the most recent TBTT and (#10416) Beacon Interval indicated in the corresponding element(s) of the affected AP and not to the TBTT and (#10416) Beacon Interval of the reporting AP.

NOTE—The affected AP can correspond to a transmitted BSSID in a multiple BSSID set or an AP with dot11MultiBSSIDImplemented equal to false. The case where the affected AP corresponds to nontransmitted BSSID in a multiple BSSID set is covered in the next paragraph.

(#10647)NOTE - The Switch Time field in the Max Channel Switch Time element is not tied to a TBTT on the affected link. Instead, it provides an estimated time when the first Beacon frame will be transmitted on the affected link after the channel switch has occurred.

(#11967, #12939)NOTE – For the Beacon and Probe Response frames all five elements are applicable. For the (Extended) Channel Switch Announcement frame, the applicable elements include the Channel Switch Announcement, Extended Channel Switch Announcement, and Max Channel Switch Time elements.

If an AP corresponding to the transmitted BSSID in a multiple BSSID set includes any of the following elements (#13372, #10648) in the Beacon frame or Probe Response frame it transmitsso that any of these elements is inherited for the affected AP in these frames:

* Channel Switch Announcement element
* Extended Channel Switch Announcement element
* Max Channel Switch Time element
* Quiet element corresponding to quiet intervals other than quiet intervals scheduled to protect (#11109)R-TWT SPs (see [35.9.4.2 (Quieting STAs during R-TWT SPs(#10893)(#11109))](#bookmark109))
* Quiet Channel element

and if the affected AP corresponding to a nontransmitted BSSID in the same multiple BSSID set is affiliated with an AP MLD (#10490, #11746, #13790, #10491) with at least another AP, then one of the (#11260, #11745) following shall apply:

* Another AP (reporting AP) affiliated with the same AP MLD and not corresponding to a nontransmitted BSSID shall carry the corresponding element(s) in the STA Profile field of the Per- STA Profile subelement corresponding to the affected AP contained in the Basic Multi-Link element included in a Beacon frame and Probe Response frame that it transmits.
* An AP corresponding to the transmitted BSSID in the same multiple BSSID set as a nontransmitted BSSID (reporting AP) that is affiliated with the same AP MLD as the affected AP shall carry the corresponding element(s) in the STA Profile field of the Per-STA Profile subelement corresponding to the affected AP contained in the Basic Multi-Link element carried in the Nontransmitted BSSID Profile subelement in the Multiple BSSID element included in a Beacon frame and Probe Response frame that it transmits.

and

The timing fields in the Channel Switch Announcement element, the Extended Channel Switch Announcement element, the Quiet element, and the Quiet Channel element shall be applied in reference to the most recent TBTT and (#10416) Beacon Interval included in the corresponding element(s) of the affected AP and not with respect to the TBTT and (#10416) Beacon Interval of the reporting AP.(#10647)NOTE - The Switch Time field in the Max Channel Switch Time element is not tied to a TBTT on the affected link. Instead, it provides an estimated time when the first Beacon frame will be transmitted on the affected link after the channel switch has occurred.

If an AP affiliated with an AP MLD is switching channel, the Channel Switch Announcement element, the Extended Channel Switch Announcement element, and the Max Channel Switch Time element will be included in every Beacon and Probe Response frames on all links of the AP MLD from right after the time the AP includes the elements in the Beacon frame it transmits until the intended channel switch time. The Max Channel Switch Time element, (#13917)if it is included for the AP along with the (extended) Channel Switch Announcement frame, shall be included in the per-STA profile of the affected AP in every Beacon and Probe Response frames on all links of the AP MLD until the affected AP resumes BSS operation on the new channel. The value carried in the Switch Time field indicates the (#14118) adjusted estimated time of the first Beacon frame in the new channel.

(#11120, #11439) NOTE - The reporting AP might increase the value carried in the Switch Time field of the Max Channel Switch Time element if the affected AP performs a second channel switch between the target time of a first channel switch and the time at which the affected AP will start beaconing on the new channel corresponding to the first channel switch.

When an AP (affected AP) affiliated with an MLD is switching from an initial operating class/channel to a target operating class/channel at a target switch time using channel switch announcement procedure or extended channel switch announcement procedure, (#10492) and if another AP is affiliated with the same AP MLD as the affected AP, then:

* (#10492)the other AP (reporting AP) affiliated with the AP MLD shall set the Operating Class and Channel Number fields corresponding to the affected AP that is reported in the Reduced Neighbor Report element in Beacon and Probe Response frames it transmits (or that the transmitted BSSID in the same multiple BSSID set as the reporting AP transmits if the reporting AP corresponds to a nontransmitted BSSID) (#12633)to the initial operating class/channel (#12633)before the target switch time,
* (#10492)the other AP (reporting AP) affiliated with the AP MLD shall set the Operating Class and Channel Number fields corresponding to the affected AP that is reported in the Reduced Neighbor Report element in Beacon and Probe Response frames it transmits (or that the transmitted BSSID in the same multiple BSSID set as the reporting AP transmits if the reporting AP corresponds to a nontransmitted BSSID) (#12361) (#12634) to the target operating class/channel (#12634)at and after the target switch time.
* Between the target switch time and the time at which the AP will start beaconing in the target operating class/channel, the Neighbor AP TBTT Offset subfield for the corresponding AP in the Reduced Neighbor Report element shall be set to 255.

If an AP (affected/reported AP) of an AP MLD is switching from an initial operating class/channel to a target operating class/channel at a target switch time using channel switch announcement or extended channel switch announcement procedure and includes a Max Channel Switch Time element in the Beacon and Probe Response frames it sends, and another AP (reporting AP) affiliated with the AP MLD (#10493),if any, receives a (Re)Association Request frame to perform multi-link setup with the AP MLD with the AP (affected/ reported AP) as a requested link, then the other AP (reporting AP) shall include the complete profile for the AP indicating the target operating class/channel and a Max Channel Switch Time element in the per-STA profile corresponding to the AP (affected/reported AP) in the Basic Multi-link element included in the (Re)Association Response frame it sends in response to indicate the time at which the AP (affected/reported AP) will start beaconing, if the (Re)Association Response frame is sent between the last beacon on the initial operating class/channel and the first beacon on the target operating class/channel. Otherwise, the other AP (reporting AP), (#10494) if any, (#13374)should not include a Max Channel Switch Time element or (Extended) Channel Switch Announcement element in (Re)Association Response frames.

When an AP (affected/reported AP) of an AP MLD has announced quiet intervals (#13371) other than quiet intervals scheduled to protect R-TWT SPs (see [35.9.4.2 (Quieting STAs during R-TWT SPs)](#bookmark109)) using Quiet element and optionally Quiet Channel element, and another AP (reporting AP) of the same AP MLD(#10495), if any, receives a (Re)Association Request frame to perform multi-link setup with the AP MLD with the AP (affected/ reported AP) as a requested link, then the other AP (reporting AP) (#10496), if any, shall include the corresponding Quiet element and Quiet Channel element (if present) in the per-STA profile corresponding to the AP (affected/ reported AP) in the Basic Multi-link element included in the (Re)Association Response frame it sends in response. Otherwise, the other AP (reporting AP) (#13374)should not include a Quiet element and Quiet Channel element in (Re)Association Response frames.

For the example shown in [Figure 35-13 (Example of an AP carrying a Quiet element to signal channel](#bookmark48) [quieting on another link)](#bookmark48), AP 1 and AP 2 are two APs affiliated with an AP MLD that operate on Link 1 and Link 2, respectively. The Beacon frame transmitted by AP 1 includes a Quiet element to indicate a scheduled quiet interval on Link 1 (the affected AP). From this point onward and until the quiet interval

begins on Link 1, AP 2, which operates on Link 2 (the reporting AP), includes a Quiet element in the Per- STA Profile subelement corresponding to AP 1 in the Basic Multi-Link element carried in its Beacon frames. Although not shown in the figure, Quiet element will also be included in the Per-STA Profile subelement of the Basic Multi-Link element corresponding to AP 1 carried in the Probe Response frames transmitted by AP 2. The values of the Quiet Count field, Quiet Offset field, and the Quiet Duration field of the Quiet element carried on Link 2 are set by AP 2 with reference to Link 1. As the value of the Beacon Interval for AP 2 is greater than the value of beacon interval for AP 1, the Quiet Count field of the Quiet element is decremented at a faster rate (i.e., 2 in this example) in every subsequent beacon transmitted by AP1. In [Figure 35-13 (Example of an AP carrying a Quiet element to signal channel quieting on another](#bookmark48) [link)](#bookmark48), a STA affiliated with a non-AP MLD, which is capable of operating on Link 2, transmits a (Re-

)Association Request frame to AP 2, in order to perform multi-link setup. The multi-link setup includes Link 1 as one of the links. Since the (Re)Association Response frame is transmitted by AP 2 after the quiet interval has started on Link 1, AP 2 includes the Quiet element in the per-STA profile corresponding to AP 1 in the (Re)Association Response frame it transmits. The value of the Quiet Count field of the Quiet element carried in the (Re )Association Response frame is set to 129 to indicate that the quiet interval on Link 1 started in the beacon interval that occurred 2 TBTTs in the past on Link 1.

Quiet Count =4



Quiet Duration

**Affected**

**AP**

Quiet Count =3

Quiet Count =2

Quiet Count =1

Link 1 (AP1)

Quiet Count =3



Quiet Count =1

Quiet Count =128

Change Sequence for AP1 incremented

**Reporting AP**

(Re)Association Response frame includes Quiet element

Link 2 (AP2)

Beacon frames



(Re)Association Response frame

**Figure 35-13—Example of an AP carrying a Quiet element to signal channel quieting on another link**

For the example shown in [Figure 35-14 (Example of an AP carrying a Channel Switch Announcement](#bookmark49) [element to signal channel switching on another link)](#bookmark49), AP 1 and AP 2 are two APs affiliated with an AP MLD that operate on Link 1 and Link 2, respectively. The Beacon frame transmitted by AP 1 includes a Channel Switch Announcement element to indicate that the channel on Link 1 (the affected AP) will be switched. From this point onward and until the channel on Link 1 switches, AP 2, which operates on Link 2 (the reporting AP), includes a Channel Switch Announcement element in the per-STA profile corresponding to AP 1 in the Basic Multi-Link element carried in the Beacon frame it transmits. When AP 1 begins to include the Channel Switch Announcement element in its Beacon frames, the Change Sequence subfield in the TBTT Information field corresponding to AP 1 in the Reduced Neighbor Report element carried in AP 2’s Beacon frames is incremented by 1. The values of the Channel Switch Count field of the Channel Switch Announcement element carried on Link 2 are set by AP 2 with reference to Link 1. As the value of the beacon interval for AP 2 is twice the value of beacon interval for AP 1, the Channel Switch Count field of the Channel Switch Announcement element is decremented by 2 in every subsequent beacon transmitted by AP 1. If AP 1 carries the Extended Channel Switch Announcement element and the Max Channel Switch Time element in the Beacon frame its transmits, AP 2 also includes the Extended Channel Switch Announcement element and the Max Channel Switch Time element in the per-STA profile corresponding to AP 1 in the Basic Multi-Link element in the Beacon frames it transmits. Although not shown in the figure, the Channel Switch Announcement element, Extended Channel Switch Announcement element (if included by AP 1), and Max Channel Switch Time element (if included by AP 1) will also be included in the Per-STA

Profile subelement of the Basic Multi-Link element corresponding to AP 1 carried in the Probe Response frames transmitted by AP 2. In [Figure 35-14 (Example of an AP carrying a Channel Switch Announcement](#bookmark49) [element to signal channel switching on another link)](#bookmark49), a STA affiliated with a non-AP MLD, that operates on Link 2, transmits a (Re)Association Request frame to AP 2 requesting Link 1 as one of the links for multi- link setup. Since the (Re)Association Response frame is transmitted by AP 2 after the last Beacon frame on the initial operating class/channel on Link 1 and before the first beacon on the initial operating class/channel is transmitted, AP 2 includes the Max Channel Switch Time element in the per-STA profile corresponding to AP 1 in the (Re)Association Response frame it transmits. The value carried in Max Channel Switch Time element provides an estimate of time until the first TBTT on the new channel on Link 1. The STA affiliated with the non-AP MLD operating on Link 1 does not transmit a frame until it hears the first Beacon frame from AP 1 on Link 1.

Channel Switch Count =4



Channel Switch Count =3

Channel Switch Count =2

Channel Switch Count =1

Channel Switch Count =3



**Affected AP**

Channel Switch Count =1

Last Beacon on initial operating class/channel

Max Channel Switch Time

First Beacon on new operating class/channel

Link 1 (AP1)

Change Sequence for AP1 incremented

**Reporting AP**

Beacon frames



(Re)Association Response frame includes Max Channel Switch Time element

(Re)Association Response frame

Link 2 (AP2)

**Figure 35-14—Example of an AP carrying a Channel Switch Announcement element to signal channel switching on another link**

An AP affiliated with an AP MLD that intends to setup quiet interval(s) (#13371) other than quiet intervals scheduled to protect R-TWT SPs (see [35.9.4.2 (Quieting STAs during R-TWT SPs)](#bookmark109)) for its BSS shall advertise the corresponding element(s) for a duration that is greater than or equal to the maximum of the TBTTs until the next DTIM Beacon frame corresponding to each AP affiliated with the same AP MLD. An AP affiliated with an AP MLD that intends to switch the operating channel for its BSS should advertise the corresponding element(s) for a duration that is greater than or equal to the maximum value of TBTTs until the next DTIM Beacon frame corresponding to each AP affiliated with the same AP MLD unless the AP is required to switch channels in a short period to meet regulatory requirement. [Figure 35-15 (Example of advertisement](#bookmark50) [duration that includes DTIM Beacon on all links)](#bookmark50) illustrates a scenario where each link has a different DTIM

interval, and the affected AP advertises the pertinent elements long enough to be included in at least one DTIM Beacon frame on each link.

Advertisement duration includes at least one DTIM Beacon frame on each link



DTIM interval of 5

**Link 1 (affected AP)**

Interval that includes DTIM Beacon on all links DTIM interval of 4

**Link 2 (reporting AP)**

DTIM interval of 3

**Link 3 (reporting AP)**

Beacon frame



Beacon frame from the affected AP carries the pertinent IE(s)

DTIM Beacon frame

Beacon frame from the reporting AP carries the pertinent IE(s) in per‐STA profile of ML IE

DTIM Beacon frame on the link carries the pertinent IE(s)



**Figure 35-15—Example of advertisement duration that includes DTIM Beacon on all links**



NOTE 1—Advertising the pertinent element(s) for a duration that includes the DTIM Beacon frame on a link makes it possible for a non-AP MLD that is monitoring only(#10497) another link, if any, and is in doze state to wakeup only to receive the DTIM beacon on that link to get the notification (by receiving the element(s) in the per-STA profile, corresponding to the affected AP, of the Basic Multi-Link element).

NOTE 2—When the other AP affiliated with the same AP MLD corresponds to a nontransmitted BSSID in a multiple BSSID set and the transmitted BSSID in the same multiple BSSID set operates as an EMA AP, then the profile for a BSS corresponding to the nontransmitted BSSID is expected to appear in the DTIM beacon for that BSSID (as described in

11.1.3.8.3 (Discovery of a nontransmitted BSSID profile)). With this mechanism, a non-AP STA, that is associated with an AP corresponding to the nontransmitted BSSID, can receive the profile (and any updates carried within the profile) in a DTIM Beacon frame without having to wake up for additional beacons thus conserving power in the process.

**9.4.2.217 Max Channel Switch Time element**

***TGbe editor: Please modify the following paragraph in subclause 9.4.2.217 Max Channel Switch Time element as shown below (#14118):***

The Switch Time field is a 3-octet field. When the Max Channel Switch Time element is carried outside a Basic Multi-Link element, the Switch Time field indicates the maximum time delta between the time the last  
Beacon frame is transmitted by the AP in the current channel and the expected time of the first Beacon frame  
in the new channel, expressed in TUs. When the Max Channel Switch Time element is carried in a Basic Multi-Link element, in the Per-STA Profile subelement corresponding to a reported AP, the Switch Time field indicates the maximum time delta between the time the last Beacon frame is transmitted by the reported AP in its current channel and the expected time of the first Beacon frame in its new channel, expressed in TUs, until the channel switch takes effect. After the channel switch has occurred on the reported link, the Switch Time field indicates the estimated time delta between the time the frame carrying the Basic Multi-Link element containing the Max Channel Switch Time element is transmitted by the reporting AP and the expected time of the first Beacon in the new channel by the reported AP (see 35.3.11).

**11.9.3.2 Selecting and advertising a new channel in an infrastructure BSS**

***TGbe editor: Please add the following NOTE at the end of subclause 11.9.3.2 Selecting and advertising a new channel in an infrastructure BSS (#13373)***

NOTE – If an EHT AP punctures some subchannels for the BSS in the new channel, its associated STAs that perform extended channel switching receive that information in the Disabled Subchannel Bitmap field in the EHT operation element in the Beacon or Probe Response frames that they receive from the EHT AP on the new channel.

**11.8.8.2 Selecting and advertising a new channel in a non-DMG infrastructure BSS**

***TGbe editor: Please add the following NOTE at the end of subclause 11.8.8.2 Selecting and advertising a new channel in a non-DMG infrastructure BSS (#13373)***

NOTE – If an EHT AP punctures some subchannels for the BSS in the new channel, its associated STAs that perform channel switching receive that information in the Disabled Subchannel Bitmap field in the EHT operation element in the Beacon or Probe Response frames that they receive from the EHT AP on the new channel.