IEEE P802.11  
Wireless LANs

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| CR for 6GHz - Discovery | | | | |
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| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Laurent Cariou |  |  |  | laurent.cariou@intel.com |
| Po-Kai Huang |  |  |  |  |

Abstract

This document provides CR for CIDs 15121, 15825.

1. **Introduction**

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 TGax Draft. The introduction and the explanation of the proposed changes are not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 15121 | 27.16.1 | 369 | Spec needs to provide rules on how a non-AP STA discovers and associates with a 6GHz BSS. Need details on how 6GHz BSS presence and configuration is advertised in 5/2.4G | As in comment | Revised – agree with the commenter. Apply the changes as proposed in doc 1227r6. |
| 15825 | 27 | 253 | 802.11ax now enables support for 6GHz band. Most devices will soon become tri-band devices. The discovery of APs and corresponding scanning time will increase and impact overhead in the channel and power/time consumption on STAs side. Full discovery of 6GHz APs should be enabled by simply scanning 2.4 and 5GHz bands only as today. This can simply be achieved by defining a multi-band collocated device that has multiple APs in different bands, and by imposing rules so that a discovery message (neighbor report, multiband element) is included in the 2.4 and 5GHz APs to describe the collocated AP at 6GHz | Define a Multiband collocated AP, that is part of a Multiband collocated device. And define rules to enable full discovery at 2.4 and 5GHz of collocated 6GHz APs. | Revised – agree with the commenter. Apply the changes as proposed in doc 1227r6. |

1. Discussion

**Objectives of this contribution**

802.11ax voted to extend the scope of the project to operation up to 7.125GHz, in order to enable 802.11ax operation in the 6GHz band, which spans from 5935MHz to 7125MHz.

It is expected that all APs operating at 6GHz, except soft APs, will be multi-band collocated devices operating at 6GHz and at 2.4 and/or 5 GHz. Scanning more than 1.2GHz of spectrum is very demanding time-wise and energy-wise. In order to reduce this impact on resource overhead at 6GHz and energy and time consumption on STA side, we propose to enure that all 6GHz APs (that are collocated with another AP in the lower band) can be discovered by scanning the lower bands (2.4 and 5GHz) only, as it is done today. This is the basic concept that is covered by this document.

All this can be very simply done by:

* Defining a multi-band collocated device that is made of several collocated APs operating on different bands.
* If this multi-band collocated device include an AP at 6GHz, we can mandate that the collocated APs in the lower bands (2.4 or 5GHz) include a discovery message (neighbour report or multi-band element) describing the 6GHz collocated AP.

The objective is that a STA that scans 2.4 and 5GHz will have all the information it requires to decide if it wants/can associated with one of the 6GHz APs. It should then get as much information as it would get by sending a probe request to the 6GHz AP. When it wants to associate with the 6GHz AP, it only needs to send one frame: association request.

**Allowing probe request in lower band to collect 6GHz info**

The overhead of such discovery message can become quite large, we can then have 2 options:

* Either transmit the complete information describing the 6GHz APs in all beacons, probe responses,,, transmitted in the lower bands
* Or transmit only a partial information and have the ability to receive a probe request in the 2.4/5GHz band from the STA to ask for the complete information regarding the 6GHz AP. On-channel tunnelling procedure currently defined in the 802.11 spec allows this and it is the natural solution here. It allows to tunnel a probe request from a 6GHz STA to a 6GHz AP by using an over-the-air transmission between the STA and AP at 2.4/5GHz… and the same for probe response on the other direction.

**How to design the discovery message**

We need to define a way to:

* 1) Discover a collocated AP at 6GHz when receiving a beacon or a probe response from the collocated 2.4 or 5GHz AP. There is therefore a need for a signalling of co-location
* 2) Discover a multi-band collocated device made of several APs in different bands, when receiving a beacon or other frame from a neighbour AP.

Discussion:

* In 802.11, we use neighbour report and multi-band elements for discovering other APs. Neighbour reports currently does not provide any info whether the AP describe is collocated or not, and can be used for BSS transitions in all cases.
* Multi-band element is specifically used to disover collocated APs.
* Neighbor reports are used throughout the spec for BSS transitions procedures and these procedures must still be functioning at 6GHz, as they are widely used. We therefore need to send neighbour reports from collocated or non-collocated AP describing the 6GHz APs.
* Multi-band element enables also other functionalities, some of them would be very useful, such as On-Channel tunnelling (OCT) and multi-band RSNA. Otherwise, the information provided is often redundant with the one provided in the neighbour report.

Several solutions are possible for 1):

Option 1:

* Just mandating sending a reduced neighbour report in beacons at 2.4/5GHz to collect BSSID, operating band/channel
  + Based on this information, STA can do active scanning at 6GHz.
* Providing a way for a STA to request more information (all the information it gest by doing active scanning at 6GHz), but through the collocated AP at 2.4/5GHz.
  + OCT seems the easiest solution, as already defined in the spec

Option 2:

* Mandating sending a neighbor report in beacons at 2.4/5GHz to collect BSSID, operating band/channel, indication of collocation and more information.
* Either the information is complete or the AP provides a way for the STA to request more information (all the information it gets by doing active scanning at 6GHz), but through the collocated AP at 2.4/5GHz.
  + OCT seems the easiest solution, as already defined in the spec

Option 3:

* Mandating sending a multi-band element in beacons at 2.4/5GHz to collect BSSID, operating band/channel and more information (add an otional subelement to the MBE).
* Either the information is complete or the AP provides a way for the STA to request more information (all the information it gets by doing active scanning at 6GHz), but through the collocated AP at 2.4/5GHz.
  + OCT seems the easiest solution, as already defined in the spec

For 2)

It seems that the best option is to use neighbor reports. A neighbour report will then be sent for each of the 2/3 collocated APs. We simply need a way to identify that these APs are collocated. The simplest approach is to include a field indicating collocation and to mandate that these neighbour reports are transmitted one after the other.

This contribution proposes to use only Reduced Neighbor Report (compromised solution) in beacons and probe responses.

The part highlighted in red is not part of the resolution (removed as a compromise)

2. **Proposed changes**

***11ax Editor: Modify 9.4.2.137 Multi-band element as follows:***

* Multi-band element

***11ax Editor: Modify Figure 9.556 Multi-band element format as follows:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Multi-band Control | Band ID | Operating Class | Channel Number | BSSID | Beacon Interval |
| Octets: | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 2 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | TSF Offset | Multi-band Connection Capability | FSTSessionTimeout | STA MAC  Address  (optional) | Pairwise Cipher Suite Count (optional) | Pairwise Cipher Suite List (optional) | BSS Parameters | MaxBSSID Indicator |
| Octets: | 8 | 1 | 1 | 0 or 6 | 0 or 2 | 4 × *m* | 1 | 0 or 1 |
| |  |  | | --- | --- | |  | Optional  subelements | | Octets: | Variable |  * Multi-band element format | | | | | | |  |  |

(…existing texts…)

The STA MAC Address field contains the MAC address that the transmitting STA uses while operating on the channel indicated in this element. The STA MAC Address field is not present in this element if the STA MAC Address Present field is set to 0.

The Pairwise Cipher Suite Count field and the Pairwise Cipher Suite List field are defined in 9.4.2.24 (RSNE). These fields are not present in this element if the Pairwise Cipher Suite Present subfield is set to 0.

The format of BSS Parameters subfield is defined in Figure 9-xxx (BSS Parameters subfield).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 | | B1 | B2 B7 |
|  | Same SSID | | MaxBSSID Indicator Present | Reserved |
| Bits: | 1 | | 1 | 6 |
|  | | * BSS Parameters subfield format | | | |

The Same SSID subfield is set to 1 to indicate that the AP described in this Multi-band element uses the same SSID as the AP that sends the Multi-band element. In all other cases, the Same SSID subfield is set to 0.

The MaxBSSID Indicator Present subfield is set to 1 to indicate that the AP described in the Multi-band element is part of a multiple BSSID set and that is not the Transmitted BSSID. In all other cases, this subfield is set to 0.

The MaxBSSID Indicator subfield is defined in 9.4.2.45 Multiple BSSID element. The MaxBSSID Indicator subfield is present only if the MaxBSSID Indicator Present subfield is set to 1. The Optional Subelements field contains zero or more subelements. The subelement format and ordering of subelements are defined in 9.4.3 (Subelements).

The Subelement ID field values for the defined subelements are shown in Table 9-xxx (Optional subelement  
IDs for Multi-band).

|  |  |  |
| --- | --- | --- |
| Subelement ID | Name | Extensible |
| 0 | SSID |  |
| 1-70 | Reserved |  |
| 71 | Multiple BSSID | Subelement |
| 72-220 | Reserved |  |
| 221 | Vendor Specific |  |
| 222-255 | Reserved |  |

The Multiple BSSID subelement has the same format as their corresponding elements (see 9.4.2.45) except that the Nontransmitted BSSID profile sublement in the multiple BSSID sublement may not contain the Nontransmitted BSSID Capability element, the SSID element, the multiple BSSID-index element, the FMS descriptor element, and the Non-Inheritance element (see 27.16.1.1 (Basic HE BSS operation in the 6GHz band)).

The Vendor Specific subelements have the same format as their corresponding elements (see 9.4.2.25  
(Vendor Specific element)).

***11ax Editor: Modify 9.4.2.170 Neighbor AP information field element as follows:***

* Neighbor AP Information field

The Neighbor AP Information field specifies TBTT and other information related to a group of neighbor APs on one channel. See Figure 9-622 (Neighbor AP Information field format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | TBTT Information Header | Operating Class | Channel Number | TBTT Information Set |
| Octets: | 2 | 1 | 1 | variable |
| * Neighbor AP Information field format | | | | |

The format of TBTT Information Header subfield is defined in Figure 9-623 (TBTT Information Header subfield).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B1 | B2 | B3 | B4 B7 | B8 B15 |
|  | TBTT  Information Field Type | Filtered  Neighbor AP | Multiband Collocated AP | TBTT  Information Count | TBTT  Information Length |
| Bits: | 2 | 1 | 1 | 4 | 8 |
| * TBTT Information Header subfield | | | | | |

The TBTT Information Field Type subfield is 2 bits in length and identifies, together with the TBTT Information Length subfield, the format of the TBTT Information field. It is set to 0.(#1533)(#1535). (11ai)Values 1, 2, and 3 are reserved.(#1533)

The Filtered Neighbor AP subfield is 1 bit in length. (11ai)When included in a Probe Response frame, it is set to 1 if the SSID corresponding to every AP(#341) in this Neighbor AP Information field matches the SSID in the (11ai)corresponding Probe Request frame. (11ai)When included in a Beacon or FILS Discovery frame transmitted by a non-TVHT AP, it is set to 1 if the SSID corresponding to every AP(#341) in this Neighbor AP Information field matches the SSID of the transmitting AP’s BSS. It is set to 0 otherwise.(11ai)(#1533)

The Multiband Collocated AP subfield is 1 bit in length and is set to 1 if the TBTT Information set field in the Neighbor AP Information field describe BSSIDs that are in the same device as the BSSID transmitting this element, and is set to 0 otherwise.

(#1533)The TBTT Information Count subfield is 4 bits in length and contains the number of TBTT Information fields included in the TBTT Information Set field of the Neighbor AP Information field, minus one. For example, a value of 0 indicates that one TBTT Information field is included.

(#1533)The TBTT Information Length subfield is 1 octet in length and indicates the length of each TBTT Information field included in the TBTT Information Set field of(#342) the Neighbor AP Information field. When the TBTT Information Field Type subfield is set to 0, the TBTT Information Length subfield:

* contains the length in octets of each TBTT Information field that is included in the TBTT Information Set field of(#342) the Neighbor AP Information field
* is set to 1, 5, 7, 8, 9, 11, or 12; other values are reserved.(11ai)
* indicates the TBTT Information field contents as shown in Table 9-273 (TBTT Information field content(11ai)).

(#1533)A TVHT AP sets the TBTT Information Length subfield to 1.

(11ai)The TBTT Information Length subfield is interpreted as shown in Table 9-283 (TBTT Information field(11ai) contents(#1533)).

|  |  |
| --- | --- |
| * TBTT Information field(11ai) contents(#1533) | |
| TBTT Information Length subfield value | TBTT Information field contents |
| 1 | The Neighbor AP TBTT Offset subfield |
| 5 | The Neighbor AP TBTT Offset subfield and the Short-SSID subfield |
| 7 | The Neighbor AP TBTT Offset subfield and the BSSID subfield |
| 11 | The Neighbor AP TBTT Offset subfield, the BSSID subfield and the Short-SSID subfield |
| 8 | The Neighbor AP TBTT Offset subfield, the BSSID subfield, and the BSS Parameters subfield |
| 12 | The Neighbor AP TBTT Offset subfield, the BSSID subfield, the Short-SSID subfield and the MaxBSSID Indicator subfield |
| 9 | The Neighbor AP TBTT Offset subfield, the BSSID subfield and the BSS Parameters subfield, and the MaxBSSID Indicator subfield |
| 0, 2–4, 6, 8–10, 12–255 | Reserved |

The Operating Class field is 1 octet in length and indicates a channel starting frequency that, together with the Channel Number field, indicates the primary channel of the BSSs of the APs in this Neighbor AP Information field. Values of Operating Class are shown in Table E-4 (Global operating classes), of which operating classes that, together with the channel number, indicate the primary channel is valid (see 11.49 (Reduced neighbor report(#1533))).

NOTE—The Operating Class field and Channel Number tuple indicate the primary channel in order to assist with passive scanning.

The Channel Number field is 1 octet in length and indicates the last known primary channel of the APs in this Neighbor AP Information field. Channel Number is defined within an Operating Class as shown in Table E-4 (Global operating classes).

The TBTT Information Set field contains one or more TBTT Information fields. The TBTT Information field is defined in Figure 9-624 (TBTT Information field (11ai)format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Neighbor AP TBTT Offset | BSSID (optional)(#15)(11ai) | Short-SSID (optional)(#15)(11ai) | BSS Parameters | MaxBSSID Indicator |
| Octets: | 1 | 0 or 6 | 0 or 4 | 0 or 1 | 0 or 1 |
| * TBTT Information field (11ai)format | | | |  |  |

The Neighbor AP TBTT Offset subfield is 1 octet in length and indicates the offset in TUs, rounded down to nearest TU, to the next TBTT of an AP from the immediately prior TBTT of the AP that transmits this element. The value 254 indicates an offset of 254 TUs or higher. The value 255 indicates an unknown offset value.

The BSSID is defined in 9.2.4.3.4 (BSSID field).(11ai)

The Short-SSID subfield is calculated as given in 9.4.2.170.3 (Calculating the Short-SSID(11ai)).(11ai)

The format of BSS Parameters subfield is defined in Figure 9-xxx (BSS Parameters subfield).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 | | B1 | B1 B7 |
|  | Same SSID | | OCT Supported | Reserved |
| Bits: | 1 | | 1 | 6 |
|  | | * BSS Parameters subfield format | | | |

The Same SSID subfield is set to 1 to indicate that the AP in this Neighbor AP Information field has the same SSID as the AP that sends the reduced neighbor report. Otherwise, the Same SSID subfield is set to 0.

The OCT Supported subfield is set to 1 to indicate that the OCT procedure described in 11.31.5 (On-channel Tunneling (OCT) operation) can be used to exchange management frames with the AP described in this Neighbor AP Information field through over-the-air transmissions with the AP sending the Reduced Neighbor Report.

The MaxBSSID Indicator subfield is defined in 9.4.2.45 Multiple BSSID element.

***11ax Editor: Modify 27.16.1 Basic HE BSS operation as follows***

27.16.1 Basic HE BSS operation

27.16.1.1 Basic HE BSS operation in the 6GHz band

A multiband collocated AP is an AP that is part of a device that has multiple APs operating in different operating channels.

An AP operating on a 2.4 or 5 GHz channel may advertise the information of a multiband collocated AP operating on a 6 GHz channel in Beacon frames and Probe Response frames with one of the following methods:

* A Reduced Neighbor Report containing a Neighbor AP Information field corresponding to AP operating in the 6 GHz channel, where the Multiband Collocated AP subfield shall be set to 1 and:
  + The BSSID subfield shall be present
  + The SSID of the AP shall be advertised by one of the following methods:
    - The Same SSID subfield of the BSS Parameters subfield is set to 1
    - The Short-SSID field is present.
  + If the AP operating on the 6 GHz channel is in a multiple BSSID set, the MaxBSSID Indicator subfield shall be present.
  + A Multi-band element configured such that it satisfies one of the following conditions:If the AP operating at 6GHz is not in a multiple BSSID set or the AP operating at 6GHz is in a multiple BSSID set, and the BSSID of the AP is equal to the transmitted BSSID of the multiple BSSID set, then the BSSID field is set to the BSSID of the AP operating on the 6 GHz channel, and the SSID of the AP is advertised by one of the following methods:
    - The Same SSID subfield of the BSS Parameters subfield is set to 1.
    - The SSID subelement is included in the Multi-band element
  + If the AP operating at 6GHz is in a multiple BSSID set, and the BSSID of the AP is not equal to the transmitted BSSID of the multiple BSSID set, then the BSSID field is set to the BSSID of the AP, the Multiple BSSID set subfield is set to 1. The SSID of the AP is advertised by one of the following methods:
    - The Same SSID subfield of the BSS Parameters subfield is set to 1.
    - SSID subelement is included
  + If the AP operating at 6GHz is in a multiple BSSID set, and the BSSID of the AP is not equal to the transmitted BSSID of the multiple BSSID set, then the BSSID field is set to the transmitted BSSID of the multiple BSSID set, and a multiple BSSID subelement, which contains at least the nontransmitted BSSID profile of the AP, is included in the Multi-band element. The nontransmitted BSSID profile of the AP includes at least the Multiple BSSID-Index element. The SSID of the AP is advertised by one of the following methods:
    - The Same SSID subfield of the BSS Parameters subfield is set to 1.
    - The SSID subelement is included in the Multi-band element
    - The SSID subelement is included in the nontransmitted BSSID profile of the multiple BSSID subelement

***Note for reviewer (not part of resolution): main rule for collocated AP with the same SSID***

If an AP operating on a 6 GHz channel is in the same device as a multiband collocated AP operating on a 2.4 or 5 GHz channel with the same SSID, and the multiband collocated AP is not in a multiple BSSID set, then the multiband collocated AP operating on a 2.4 or 5 GHz channel shall advertise the information of the AP operating on a 6 GHz channel in Beacon frames, broadcast addressed Probe Response frames, individually addressed Probe response frames to a STA supporting operation in the 6 GHz band.

***Note for reviewer (not part of resolution): rules to cover the case where the BSS at 2.4/5GHz band is part of a MultiBSSID set***

If an AP operating on a 6 GHz channel is in the same device as a multiband collocated AP operating on a 2.4 or 5 GHz channel with the same SSID, and the multiband collocated AP is in a multiple BSSID set with BSSID not equal to the transmitted BSSID, then the multiband collocated AP operating on a 2.4 or 5 GHz channel shall advertise the information of the AP operating on a 6 GHz channel in individually addressed Probe Response frames to a STA supporting operation in the 6 GHz band.

If an AP operating on a 6 GHz channel is in the same device as a multiband collocated AP operating on a 2.4 or 5 GHz channel with the same SSID, and the multiband collocated AP is in a multiple BSSID set, then the AP operating on a 2.4 or 5 GHz channel with the BSSID equal to the transmitted BSSID of the multiple BSSID set shall advertise the information of the AP operating on a 6 GHz channel in Beacon frames and broadcast addressed Probe Response frames.

***Note for reviewer (not part of resolution): rule to cover the case where the BSS at 6GHz does not have a BSS in collocated AP at 2.4 and 5GHz that have the same SSID:***

If an AP operating on a 6 GHz channel is in the same device as at least one multiband collocated AP operating on a 2.4 GHz channel and does not have a multiband collocated AP operating on a 2.4 GHz channel with the same SSID, then at least one of the multiband collocated AP operating on a 2.4 GHz channel shall advertise the information of the AP operating on a 6 GHz channel in Beacon frames, broadcast addressed Probe Response frames, individually addressed Probe response frames to a STA supporting operation in the 6 GHz band.

If an AP operating on a 6 GHz channel is in the same device as at least one multiband collocated AP operating on a 5 GHz channel and does not have a multiband collocated AP operating on a 5 GHz channel with the same SSID, then at least one of the multiband collocated AP operating on a 5 GHz channel shall advertise the information of the AP operating on a 6 GHz channel in Beacon frames, broadcast addressed Probe Response frames, individually addressed Probe response frames to a STA supporting operation in the 6 GHz band.

If the OCT Not Supported field is set to 0 in the Multi-band Control field of the Multi-band element describing an HE AP operating in the 6GHz band or if the OCT Supported subfield is set to 1 in the Neighbor AP Information field describing an HE AP operation in the 6GHz band in the Reduced Neighbor Report element, then a non-AP STA that supports operation in the 6 GHz band may use the OCT procedure described in 11.31.5 (On-channel Tunneling (OCT) operation) to perform active scanning, authentication and/or association to the 6GHz AP through over-the-air transmissions with the AP that sent the Multi-band element or the Reduced Neighbor Report element and that is operating in the 2.4 or 5GHz or 6GHz band.

***11ax Editor: Spec text related to Neighbor Reports***

***11ax Editor: Modify 9.4.2.37 Neighbor Report element as follows:***

* Neighbor Report element

Change Figure 9-296 (BSSID Information field) as follows:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B1 | | B2 | | B3 | B4 B9 | B10 | B11 | B12 | B13 | B14 | B15 | B16 B17 | B18 B31 |
|  | AP Reachability | | Security | | Key Scope | Capabilities | Mobility  Domain | High Throughput | Very High Throughput | FTM | High Efficiency | HE ER BSS(#11986) | Multiband Collocated AP | Reserved |
| Bits: | 2 | | 1 | | 1 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 16 |
|  | |  | |

The Multiband Collocated AP subfield indicates if the AP described in the Neighbor Report element is a multiband collocated AP. The Multiband Collocated AP subfield is encoded as in Table xxx

|  |  |
| --- | --- |
| Table xxx – Multiband Collocated AP subfield | |
| Value | Explanation |
| 0 | Indicates that the AP reported by this Neighbor Report element is not a multiband collocated AP or the AP reported by this Neighbor Report element is a multiband collocated AP that is part of the same device as the AP reported by the immediately following Neighbor Report element if the immediately following Neighbor Report element has the Multiband Collocated AP subfield set to 2. |
| 1 | Indicates that the AP reported by this Neighbor Report is a multiband collocated AP and is part of the same device as the AP transmitting the Neighbor Report element. |
| 2 | Indicates that the AP reported by this Neighbor Report element in a frame is a multiband collocated AP and is part of the same device as the AP reported in the immediately preceeding Neighbor Report element in the frame. |
| 3 | Reserved |

***11ax Editor: Modify 11.22.7.3 BSS transition management request as follows***

* BSS transition management request

[…]

The AP shall include the BSS Transition Candidate List Entries field in the BSS Transition Management Request frame if the AP has information in response to the BSS Transition Management Query frame. The BSS Transition Candidate List Entries field contains zero or more Neighbor Report elements describing the preferences for target BSS candidates. A Preference field value of 0 indicates that the BSS listed is an excluded BSS. The STA should refrain from associating to an AP corresponding to an excluded BSS. The Preference field values are used to establish the relative order of entries within the given list at the given time, and for the given AP. The Neighbor Report elements describing multiband collocated APs from the same device shall be transmitted one after the other in a consecutive way. Among these consecutive Neighbor Report elements, the first Neighbor Report element shall have the Multiband Collocated AP subfield in the BSSID Information field set to 0, the following Neighbor Report element(s) shall have the Multiband Collocated AP subfield in the BSSID Information field set to 2.