IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PDT MAC on modes enablement and parameter updates at the AP | | | | |
| Date: July 29, 2025 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Gaurang Naik | Qualcomm Inc. |  |  | gnaik@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm |  |  | aasterja@qti.qualcomm.com |
| Abhishek Patil | Qualcomm |  |  | appatil@qti.qualcomm.com |
| Xiandong Dong | Xiaomi |  |  | dongxiandong@xiaomi.com |
| Sherief Helwa | Qualcomm |  |  | shelwa@qti.qualcomm.com |
| Dmitry Akhmetov | Intel |  |  | Dmitry.Akhmetov@intel.com |
| Laurent Cariou | Intel |  |  | Laurent.cariou@intel.com |

Abstract

This submission proposes comment resolutions for the following CIDs received during the Comment Collection 50 on 11bn Draft 0.2:

* 2512, 2479, 2692, 913, 3405, 2473, 3652, 3680, 2124, 3802
* 3801, 3771

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Changes in response to offline feedback
  + Modified the descriptions for the Mode Length field
* Rev 2: Changes in response to offline feedback
  + Included CID 3771
  + Renamed “MAC Header-Based NPCA” in Mode Parameters field for NPCA to “MOPLEN” NPCA to be consistent with CR document 11-25/936r9
* Rev 3:
  + Added text in the individual mode subclauses to refer to subclause 37.28 and resolved 1 TBD.
  + Updated number of bits for P-EDCA PSRC from 2 to 3
* Rev 4: Updates based on offline feedback
  + Clarified for P-EDCA that if the AP provides no parameters, then the default parameters apply
  + Provided a reference to mobile AP DPS operation subclause in subclause 37.28
  + Modified the format of UHR Parameters Update element to align with the Mode Change element defined in 11-25/882
    - Added a Mode Control field as the first octet in the Mode Parameters field, which explicitly differentiates enable, disable, and update parameters.
    - Mode Control field is made mode-specific
    - Updated the corresponding descriptions throughout the document.
  + Additional changes to UHR Parameters Update element
    - Modified the size of Mode Length fields to 8-bits
  + Text clarification in subclause 37.28. Technical changes as follows:
    - Normative behavior for other APs to include the UHR Parameters Update element changed from “should” to “shall”
    - The behavior to include UHR Parameters Update element after the update has taken effect clarifies that it is carried for a limited time.
  + Added normative language in 37.28 for the reporting AP to include the Mode Tuple field(s) corresponding to the updated modes in the UHR Parameters Update element.
  + Other editorial changes

**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 TGbn Draft. The abstract, revision information, introduction, explanation of the proposed changes and references sections are not part of the adopted material.

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Section** | **Pg.Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 2512 | Laurent Cariou | 37 | 67.05 | Define a critical update procedure to allow enablement/disablement of NPCA from the AP for the entire BSS. The list of parameters from NPCA or other UHR features that are allowed to be modified by the critical udpate procedure shall be dynamic parameters from the UHR Operation element and have to be clearly identified | as in comment | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable NPCA mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 2512.** |
| 2479 | Laurent Cariou | 37.1 | 78.32 | Include also the NPCA switch Back and NPCA switching delay in the operation element and always include the Operation element in Beacon and Probe Response frames transmitted by the AP. | as in comment | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes and parameters (e.g., change the NPCA switching/switch back delays) as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 2692.** |
| 2692 | Salvatore Talarico | 9.42.aa1 | 59.49 | Procedure on how the NPCA primary channel is updated over time is missing | Procedure on how the NPCA primary channel can be update over time shall be defined. | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes and parameters (e.g., change the NPCA primary channel) as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 2692.** |
| 913 | Mikael Lorgeoux | 9.4.2.1 | 59.18 | The enablement/disablement of NPCA mode and the presence of the NPCA Operation Information field are 2 different things. It seems tricky to manage both using the single bit "NPCA Operation Information Present" bit. As example, an AP may send its NPCA Operation Information field during association and may wish to enable the NPCA mode later during operation. | Suggest to manage only the presence of the NPCA Operation Information field with the "NPCA Operation Information Present" bit.  Suggest to have a dedicated "NPCA mode" bit in the "UHR Operation Parameter field" and/or in a (TBD) OM Notification frame | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable NPCA mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 913.** |
| 3405 | Gaurang Naik | 37.9.1 | 77.20 | Define a procedure for the DPS AP to enable/disable the DPS mode. When the AP transitions from the DPS disabled to the DPS enabled mode, the non-AP STA must start preceding all frames to the AP with an ICF. Similarly, when the AP transitions from the DPS disabled to the DPS enabled mode, the non-AP STA need not precede frames with an ICF. The UHR AP must provide sufficient time to the non-AP STA to react to necessary changes so that it can operate efficiently | As in comment. | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable DPS mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 3405.** |
| 2473 | Laurent Cariou | 37.9.1 | 77.21 | Define a generic way for an AP to enable DPS and other features for the BSS that impact the STAs, with sufficient time for the STA to prepare for the changes, applying something similar to the critical udpate. | as in comment | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable DPS mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 2473.** |
| 3652 | Alfred Asterjadhi | 37.9.1 | 77.21 | Define enablement/disablement procedure at the AP side in line with existing protocols (via beacons, and categorized as critical updates) so that STAs are aware of these changes at AP side. | As in comment. | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable NPCA, DPS, P-EDCA mode, etc.) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 3652.** |
| 3680 | Sherief Helwa | 37.9.1 | 77.20 | I propose the following:  "Define a mechanism ensuring that this enablement/disablement are part of the critical updates of the AP and possibly include other DPS-related parameters that might change in this category." | Explained in the comment | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable DPS mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 3680.** |
| 2124 | Vishnu Ratnam | 37.9.1 | 77.19 | The spec needs to define the mechanism for a mobile AP to enable/disable DPS operation or update its DPS parameters. | The commentor will bring a contribution to resolve the issue. | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable DPS mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 2124.** |
| 3802 | Yongho Seok | 37.9.1 | 77.21 | "The mechanism for enablement/disablement of DPS by an AP is TBD." Please describe the DPS enablement/disablement mechanism of the AP. The AP should indicate the enablement start time in advance and notify it. | Please describe the DPS enablement/disablement mechanism of the AP. | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes (e.g., enable/disable DPS mode) and parameters as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 3802.** |
| 3801 | Yongho Seok | 37.9.1 | 77.19 | "A DPS AP shall have value 1 in its transmitted DPS Enabled field to announce that it has enabled DPS and 0 otherwise." If DPS is enabled, the DPS AP should also announce the DPS Operation Parameters. Please define the DPS Operation Parameters announcemnt mechanism. | Please define the DPS Operation Parameters announcemnt mechanism. | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes and parameters (e.g., announce its DPS parameters) as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 3801.** |
| 3771 | Yongho Seok | 37.11.4 | 83.30 | The enablement/disablement procedure of AP PUO mode is missing. Please clarify the enablement/disablement procedure. | As in the comment | **Revised**  Agree with the commenter in principle. Added a procedure for a UHR AP to change its operation modes and parameters (e.g., enable or disable AP PUO) as well to announce these changes in advance.  **TGbn editor: please implement the changes shown in 11-25/1091r4 tagged as 3771.** |
|  |  |  |  |  |  |  |

**Discussion**

None

**Text to be adopted begins here:**

***TGbn editor: please add the following subclause as shown below.* (#2512, 2479, 2473, 3652, 3680)**

**(#2512, 2479, 2473, 3652, 3680) 9.4.2.X UHR Parameters Update element**

The format of the UHR Parameters Update element is shown in Figure 9-aax1 (UHR Parameters Update element format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | Countdown Timer | Mode Tuple List |
| Octets: | 1 | 1 | 1 | 1 | variable |

**Figure 9-aax1 --- UHR Parameters Update element format**

The Countdown Timer field is set to the number of TBTTs until the TBTT at which the update(s) indicated in the UHR Parameters Update element take effect at the AP corresponding to the element. The Countdown Timer field value 1 indicates that the update(s) takes effect at the next TBTT. A Countdown Timer field value greater than 127 indicates that the update(s) indicated in the element have already taken effect. If the Countdown Timer field is set to a value greater than 127, the update(s) took effect at the TBTT in the past given by the Countdown Timer field minus 127.

The Mode Tuple List field contains one or more Mode Tuple fields.

The Mode Tuple field is defined in Figure 9-aax2 (Mode Tuple field format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B5 | B6 | B7 | B8 B15 | variable |
|  | Mode ID | Mode Enable | Mode Update | Mode Length | Mode  Specific Parameters |
| Bits: | 6 | 1 | 1 | 8 | variable |

**Figure 9-aax2 --- Mode Tuple field format**

The Mode ID field contains the identifier for the UHR mode associated with the mode tuple. The encoding of this field is defined in Table 9-aay1 (Encoding of the Mode ID field).

**Table 9-XYZ1 --- Encoding of the Mode ID field**

|  |  |
| --- | --- |
| **Value** | **Mode** |
| 0 | DPS |
| 1 | NPCA |
| 2 | DUO |
| 3 | P-EDCA |
| 4 | DBE |
| 5 | AP PUO |
| 6 | ELR Reception |
| 7-63 | Reserved |

The Mode Enable field indicates whether the AP intends to enable or disable the mode identified by the Mode ID field at the TBTT indicated in the Countdown Timer field. The field is set to 1 if the AP intends to enable the mode and is set to 0 if the AP intends to disable the mode.

The Mode Update field indicates whether the AP intends to update the parameters of an already enabled mode. The field is set to 1 if the AP intends to update the parameters of an already enabled mode and it is set to 0 otherwise. The field is reserved if the Mode Enable field is set to 0.

The Mode Length field indicates the number of octets in the Mode Parameters field.

The Mode Length and Mode Specific Parameters fields are not included if the Mode Enable field is set to 0 or the value in the Mode ID field corresponds to a mode without parameters.

The definition of the Mode Specific Parameters field depends on the value of the Mode ID field for that mode tuple. The Mode Specific Parameters field is described in the subclauses below.

**9.4.2.X.1 Mode Specific Parameters for DPS**

When the value of the Mode ID field is 0,

* the Mode Tuple field corresponds to DPS, and
* the Mode Specific Parameters field carries the parameters for DPS.

The Mode Specific Parameters field for DPS and the encoding of fields in the Mode Specific Parameters field for DPS is the same as the DPS Operation Parameters field defined in 9.4.1.85 (DPS Operation Parameters field).

NOTE – An AP that is not a mobile AP that does not carry a Mode Tuple field with the Mode ID field set to 0.

**9.4.2.X.2 Mode Specific Parameters for NPCA**

When the value of the Mode ID field is 1,

* the Mode Tuple field corresponds to NPCA, and
* the Mode Specific Parameters field carries the parameters for NPCA.

The Mode Specific Parameters field for NPCA is defined in Figure 9-aax6 (Mode Specific Parameters field for NPCA format).

The encoding of fields in the Mode Specific Parameters field for NPCA is the same as the encoding of the corresponding fields in the NPCA Operation Parameters field defined in 9.4.2.aa1 (UHR Operation element).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B11 | B12 B17 | B18 B23 | B24 B25 | B26 | B27 | B28 B31 | B32 B47 |
|  | NPCA Primary Channel | NPCA Minimum Duration Threshold | NPCA Switching Delay | NPCA Switch Back Delay | Initial NPCA QSRC | MOPLEN NPCA | NPCA Disabled Subchannel Bitmap Present | Reserved | NPCA Disabled Subchannel Bitmap |
| Bits: | 8 | 4 | 6 | 6 | 2 | 1 | 1 | 4 | 16 |

**Figure 9-aax7 --- Mode Specific Parameters field for NPCA format**

**9.4.2.X.3 Mode Specific Parameters for DUO**

When the value of the Mode ID field is 2,

* the Mode Tuple field corresponds to DUO, and
* the Mode Enable field is reserved, and
* the Mode Update field is reserved, and
* the Mode Specific Parameters field carries the parameters for DUO.

The Mode Specific Parameters field for DUO is as defined in Figure 9-aax4 (Mode Specific Parameters field for DUO).

|  |  |  |
| --- | --- | --- |
|  | MaxStandaloneDUOBSRP | Reserved |

**Figure 9-aax9 --- Mode Specific Parameters field for DUO format**

**9.4.2.X.4 Mode Specific Parameters for P-EDCA**

When the value of the Mode ID field is 3,

* the Mode Tuple field corresponds to P-EDCA, and
* the Mode Specific Parameters field carries the parameters for P-EDCA.

The Mode Parameters field for P-EDCA is as defined in Figure 9-aax5 (Mode Parameters field for P-EDCA format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B3 | B4 B7 | B8 B11 | B12 B13 | B14 B15 | B16 B17 | B18 B23 |
|  | P-EDCA CWmin | P-EDCA CWmax | P-EDCA AIFSN | CW DS | P-EDCA PSRC threshold | P-EDCA QSRC threshold | Reserved |
| Bits: | 4 | 4 | 4 | 2 | 3 | 2 | 5 |

**Figure 9-aax11 --- Mode Parameters field for P-EDCA format**

The encoding of fields in the Mode Specific Parameters field for P-EDCA is the same as the encoding of the corresponding fields in the P-EDCA Operation Parameters field defined in 9.4.2.aa1 (UHR Operation element).

**9.4.2.X.5 Mode Specific Parameters for DBE**

When the value of the Mode ID field is 4,

* the Mode Tuple field corresponds to DBE, and
* the Mode Specific Parameters field carries the parameters for DBE.

**9.4.2.X.6 Mode Specific Parameters for AP PUO**

When the value of the Mode ID field is 5,

* the Mode Tuple field corresponds to AP PUO, and
* the Mode Specific Parameters field is not present, and
* the parameters for AP PUO are carried in a TWT element as defined in 37.17.4 (AP PUO mode).

**9.4.2.X.7 Mode Specific Parameters for ELR Reception**

When the value of the Mode ID field is 6,

* the Mode Tuple field corresponds to ELR Reception, and
* the Mode Update field is reserved, and
* the Mode Specific Parameters field is not present.

***TGbn editor: please Note that all subclause numbers are w.r.t. 11bn D0.3***

**37.15 Power Management**

**37.15.1 Dynamic power save (DPS) operation**

***TGbn editor: please update the following paragraph as shown below.* (#3405, 2473, 3652, 3680, 2124, 3802, 3801)**

**(#3405, 2473, 3652, 3680, 2124, 3802, 3801)** An AP may enable its DPS mode only under TBD conditions. A DPS AP shall have value 1 in its transmitted DPS Enabled field to announce that it has enabled DPS and 0 otherwise.

**37.15.1 Mobile AP’s DPS operation**

***TGbn editor: please add the following paragraph as shown below.* (#3405, 2473, 3652, 3680, 2124, 3802, 3801)**

**(#3405, 2473, 3652, 3680, 2124, 3802, 3801)** An DPS Mobile AP that intends to enable, disable or update the parameters of DPS mode shall follow the procedure defined in 37.28 (Enhanced BSS parameter critical update procedure) to notify its associated DPS assisting non-AP STAs.

**37.16 Non-primary channel access (NPCA)**

***TGbn editor: please update the following paragraph as shown below.* (#2512, 2479, 2692, 913, 3652)**

An NPCA AP that has an operating bandwidth less than TBD (but either 80 or 160 MHz) shall not enable NPCA operation. An AP of a multiple BSSID set which enables NPCA operation shall indicate the same NPCA primary channel as all of the other APs of the same multiple BSSID set which have enabled NPCA operation.

**(#2512, 2479, 2692, 913, 3652)** An NPCA AP that intends to enable, disable or update the parameters of NPCA mode shall follow the procedure defined in 37.28 (Enhanced BSS parameter critical update procedure) to notify its associated non-AP STAs.

**37.17 Unavailability reporting and parameter updates**

**37.17.2 Dynamic Unavailability Operation (DUO) mode**

***TGbn editor: please update the following paragraph as shown below.* (#3652)**

To disable DUO mode with its associated DUO Supporting AP:

* The DUO non-AP STA shall transmit a TBD Request frame with the DUO Mode subfield in the frame set to 0 to the AP.
* The associated AP shall transmit a TBD Response frame, after the AP is no longer serving the nonAP STA in the DUO mode, as a response to the received TBD Request frame, to the non-AP STA.

The disablement procedure is TBD.

**(#3652)** A DUO asssisting AP that intends to update the parameter MaxStandaloneDuoBSRP shall follow the procedure defined in 37.28 (Enhanced BSS parameter critical update procedure) to notify its associated non-AP STAs.

**37.5 Prioritized EDCA**

***TGbn editor: please update the following paragraph as shown below.* (#3652)**

**(#3652)** An AP that intends to enable, disable or update the parameters of P-EDCA mode shall follow the procedure defined in 37.28 (Enhanced BSS parameter critical update procedure) to notify its associated non-AP STAs. An AP that has enabled P-EDCA operation shall set the P-EDCA Enabled field in UHR operation element to 1.

If the most recent mode tuple corresponding to P-EDCA from the AP does not carry the Mode Specific Parameters field for P-EDCA, then the default P-EDCA parameters specified in this subclause shall apply.

**37.26 Dynamic bandwidth expansion (DBE)**

***TGbn editor: please update the following paragraph as shown below.* (#3652)**

**(#3652)** A DBE AP that intends to enable, disable or update the parameters of DBE mode shall follow the procedure defined in 37.28 (Enhanced BSS parameter critical update procedure)). After DBE mode is enabled or the DBE bandwidth is changed, the DBE AP shall continue operating with its DBE bandwidth until a subsequent change to its DBE bandwidth takes effect, or DBE mode disablement takes effect.

**37.17.4 AP PUO mode**

***TGbn editor: please update the following paragraph as shown below.* (#3652, 3771)**

To be unavailable outside of broadcast TWT SPs, a TBD AP shall ensure that all associated STAs support the mechanism and shall follow the rules defined in 26.8.3.2 (Rules for TWT scheduling AP) by advertising a TWT element that carries one or more Broadcast TWT Parameter Set fields with a Broadcast TWT ID field set to 0, a Responder PM Mode subfield equal to 1 and an NDP Paging Indicator/Unavailability Mode subfield that is set to either 0 or 1. A (name TBD) Supporting non-AP STA that intends to exchange frames with the (name TBD) AP shall follow the rules defined in 26.8.3.3 (Rules for TWT scheduled STA).

**(#3652, 3771)** An APPUO AP that intends to enable or disable AP PUO mode shall follow the procedure defined in 37.28 (Enhanced BSS parameter critical update procedure) to notify its associated APPUO assisting non-AP STA.

***TGbn editor: please add the following subclauses as shown below.* (#2512, 2479, 2692, 913, 3405, 2473, 3652, 3680, 2124, 3802, 3801, 3771)**

**(#2512, 2479, 2692, 913, 3405, 2473, 3652, 3680, 2124, 3802, 3801, 3771) 37.28 Enhanced BSS parameter critical update procedure**

A UHR AP shall follow the rules defined in 35.3.10 (BSS parameter critical update procedure) and 35.3.11 (ML procedures for (extended) channel switching and channel quieting) and additional rules and exceptions defined in this subclause.

**37.28.1 Enhanced critical update events**

The following events about the BSS parameters of an AP shall classify as an enhanced critical update:

* Insertion of the UHR Parameters Update element

**37.28.2 Advance notification of updates to operation modes and parameters**

**37.28.2.1 Operations requiring advance notification**

The following operations, when intended to be performed by an AP, require an advance notification procedure defined in 37.8.2.2 (Procedure for advance notification):

* The AP is a mobile AP and intends to enable, disable, or update one or more parameters for DPS operation on the mobile AP (See 37.15.1.2 (Mobile AP’s DPS operation)), or
* Enable, disable, or update one or more parameters for NPCA (See 37.16 (Non-primary channel access)), or
* Enable, disable, or update one or more parameters for DBE (See 37.26 (Dynamic bandwidth expansion)), or
* Update the parameter MaxStandaloneDuoBSRP for the DUO mode (See 37.17.2 (Dynamic unavailability operation (DUO) mode))
* Enable, disable, or update one or more parameters for P-EDCA (See 37.5 (Prioritized EDCA)), or
* Enable, disable, or update one or more parameters for AP PUO (See 37.17.4 (AP PUO mode)), or
* Enable or disable reception of ELR PPDUs (See 37.4.2 (Enhanced long range (ELR) operation)).

**37.28.2.2 Procedure for advance notification**

If an AP (affected AP) intends to perform one or more of the operations defined in 37.28.2.1 (Operations requiring advance notification), then a reporting AP shall include the UHR Parameters Update element in the Beacon, Probe Response, and (Re)Association Response frames that the reporting AP transmits and shall provide the indication of the enhanced critical update as defined in 37.28.2.3, if the reporting AP meets any of the following conditions:

* The reporting AP is the affected AP, or
* The reporting AP is affiliated with the same AP MLD as the affected AP
* The reporting AP is the transmitted BSSID of a multiple BSSID set and the affected AP is a nontransmitted BSSID of this multiple BSSID set
* The reporting AP is the transmitted BSSID of a multiple BSSID set and the affected AP is affiliated with the same AP MLD as a nontransmitted BSSID of this multiple BSSID set

In the UHR Parameters Update element carried by the reporting AP corresponding to the affected AP, the reporting AP shall include a Mode Tuple field corresponding to each mode defined in 37.28.2.1 (Operations requiring advance notification) and for which the affected AP intends to enable, disable, or update the parameters. When applicable for an operation, in the Mode Tuple field, the reporting AP shall include the parameters corresponding to the mode in the applicable Mode Specific Parameters field. The reporting AP shall not include a Mode Tuple field corresponding to a mode that is not enabled, disabled, or for which no parameter is updated.

On the link on which the affected AP operates:

* If the affected AP is not part of a multiple BSSID set or if the affected AP is the transmitted BSSID of a multiple BSSID set, then the reporting AP is the same as the affected AP and
  + In this case, the UHR Parameters Update element shall be included outside of any Multiple BSSID element and Multi-Link element.
* If the affected AP is a nontransmitted BSSID of a multiple BSSID set, then the reporting AP is the transmitted BSSID of that multiple BSSID set and
  + In this case, the UHR Parameters Update element shall be included in the Nontransmitted BSSID Profile subelement, corresponding to the affected AP, of the Multiple BSSID element.
  + NOTE – In this case, the UHR Parameters Update element is included outside the Basic Multi-Link element carried in the Multiple BSSID element.

On other link(s) of the AP MLD with which the affected AP is affiliated:

* If the reporting AP is the AP (AP 2) affiliated with the same AP MLD as the affected AP and if AP 2 is not part of a multiple BSSID set or is the transmitted BSSID in a multiple BSSID set.
  + In this case, the UHR Parameters Update element shall be carried in the per-STA profile corresponding to the affected AP of the Basic Multi-Link element
  + Note – In this case, the Basic Multi-Link element is carried outside the Multiple BSSID element.
* If the reporting AP is the transmitted BSSID of the multiple BSSID set and if the AP (AP 3) affiliated with the same AP MLD as the affected AP is a nontransmitted BSSID of the multiple BSSID set.
  + In this case, the UHR Parameters Update element shall be carried in the per-STA profile corresponding to the affected AP of the Basic Multi-Link element that is included in the Nontransmitted BSSID Profile corresponding to AP 3 of the Multiple BSSID element.

The reporting AP shall start including the UHR Parameters Update element in its Beacon, Probe Response and (Re)Association Response frames a duration of dot11UHRParamUpdateAdvNotificationInterval before the operation defined in 37.28.2.1 (Operations requiring advance notification) is scheduled to occur and shall include the element until and including the DTIM Beacon immediately following the TBTT at which the operation occurs.

Following the DTIM Beacon immediately after the TBTT at which the operation occurs, the reporting AP may include the UHR Parameters Update element in its Beacon, Probe Response and (Re)Association Response frames for an additional dot11UHRParamUpdatePostNotificationInterval beacon intervals and shall not include the UHR Parameters Update element thereafter.

The value of dot11UHRParamUpdateAdvNotificationInterval is fixed for all APs affiliated with an AP MLD and should be selected to be sufficiently large so that all non-AP STAs associated with the affected AP, including those in the power save mode, have the opportunity to successfully receive the UHR Parameters Update element before the updates take effect.

An AP that includes the UHR Parameters Update element in its Probe Response frame should set the Address 1 field of the frame to the broadcast address, except if explicitly stated otherwise.

**C.3 MIB detail**

***TGbn editor: please add the following MIB entry as shown below.***

*dot11UHRParamUpdateAdvNotificationInterval OBJECT-TYPE*

*SYNTAX Unsigned32 (2..5)*

*MAX-ACCESS read-write*

*STATUS current*

*DESCRIPTION*

*"This is a control variable.*

*It is written by an external management entity.*

*This attribute specifies the time interval prior to a scheduled update to an AP’s operating mode(s) or parameters at which the AP begins announcing the forthcoming update.*

*"*

*DEFVAL { 5 }*

*::= { dot11UHRStationConfigEntry 11 }*

*dot11UHRParamUpdatePostNotificationInterval OBJECT-TYPE*

*SYNTAX Unsigned32 (2..5)*

*MAX-ACCESS read-write*

*STATUS current*

*DESCRIPTION*

*"This is a control variable.*

*It is written by an external management entity.*

*This attribute specifies the time interval after a scheduled update to an AP’s operating mode(s) or parameters until which the AP announces the completed update..*

*"*

*DEFVAL { 5 }*

*::= { dot11UHRStationConfigEntry 12 }*