IEEE P802.11  
Wireless LANs

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Abstract

This document contains Proposed Draft Text (PDT) for the Multi AP (M-AP) Coordiantion framework feature of the proposed TGbn (UHR, Ultra High Reliability) amendment to the 802.11 standard.

# Revision information

The following is a summary of the important changes that occurred within each revision of this document:

|  |  |
| --- | --- |
| **Revision** | **Major changes** |
| 0 | Initial revision |
| 1 | Update based on the feedback from Tomo, Jonghoe |
| 2 | Update based on the feedback from Insun, Mahmoud |
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**TGbn editor: The baseline for this document is P802.11bnD0.1 and P802.11REVmeD7.0**

# 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).***

## Explanation of the proposed changes:

The proposed changes to the 802.11 TGbn draft within this document are based on the following motions adopted by the TGbn task group:

### Relevant passing motions:

* The sharing AP, that transmits a Trigger frame as part of a transmission sequence in a Multi-AP coordinated transmission scheme, identifies the shared AP via an AP ID carried in the AID12 field of the User Info field of the frame
  + Note: the name of "sharing AP" and "shared AP" are TBD
  + Note: Multi-AP coordinated transmission schemes are Co-SR, Co-BF and Co-TDMA

[Motion #135, [1] and [207, 208, 157, 117, 118, 122, 123, 108, 115, 124, 158]]

* As a part of M-AP coordination agreement procedure, an AP may assign an AP ID to another AP with the following constraints:
  + The AP ID is used for the AP to identify another AP as a coordinated AP, when necessary.
  + The AP ID field has the same size and the field value has a range as defined in AID field (see 9.4.1.8)
  + The AP shall ensure that the AP ID value is not assigned by the AP or by its affiliated MLD to any other STA (e.g., STA is an associated non-AP STA, an unassociated non-AP STA that has been allocated a (Ranging session Identifier) RSID , or any other coordinated AP), or a non-AP MLD that is associated with the AP MLD
  + It's TBD whether the AP ID value is greater than 2^n where n is the maximum of the value carried in the MBSSID Indicator (n) field of the Multiple BSSID element for any AP affiliated with the AP MLD that belongs to a multiple BSSID set

[Motion #265, [264] and [207, 208, 157, 117, 118, 122, 123, 108, 115, 124, 158, ]]

# Text to be adopted begins here:

***TGbn editor: Please make the following changes to the latest 802.11bn draft:***

**9.4.1.X AP ID field**

In MAPC, the AP ID field is a value that represents the 16-bit ID of a neighbor coordinated AP, assigned during MAPC Agreement negotiation procedure. The AP ID is shown in Figure 9-X1 (AP ID field format).

|  |  |
| --- | --- |
|  | AP ID |
| Octets: | 2 |

Figure 9-X1 ---AP ID field format

The AP ID field is in the range 1 to 2006. This value is placed in the 14 LSBs of the AP ID field, with the two MSBs of the AP ID field set to 1.

**9.6.7 Public Action frame details**

**9.6.7.55a MAPC Request frame format [Name and semantics are TBD]**

~~TBD~~

The MAPC Request frame allows the initiating AP to request an MAPC agreement negotiation procedure (37.8.1.3 MAPC agreement negotiation).

The format of the (Protected) MAPC Request frame Action field is defined in Figure 9-X2 ((Protected) MAPC Request frame Action field format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Category | Public Action/  Protected Dual of Public Action | Dialog Token | AP ID |
| Octets: | 1 | 1 | 1 | 2 |

Figure 9-X2 ((Protected) MAPC Request frame Action field format

The Category field is defined in 9.4.1.11 (Action field).

The Public Action/Protected Dual of Public Action field is defined in 9.6.7.1 (Public Action field) and in 9.6.10 (Protected Dual of Public Action frames).

The Dialog Token field is defined in 9.4.1.12 (Dialog Token field).

If the initiating AP assigns an AP ID to the responding AP, the AP ID field contains an AP ID assigned by the initiating AP to the responding AP, and is defined in 9.4.1.X1 (AP ID field). Otherwise, the AP ID field is reserved.

**9.6.7.55b MAPC Response frame format [Name and semantics are TBD]**

~~TBD~~

The (Protected) MAPC Response frame is transmitted by the responding AP to accept or reject a request for an MAPC agreement negotiation procedure (37.8.1.3 MAPC agreement negotiation). The format of the (Protected) MAPC Response frame Action field is defined in Figure 9-X3 ((Protected) MAPC Response frame Action field format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Category | Public Action/  Protected Dual of Public Action | Dialog Token | Status Code | AP ID |
| Octets: | 1 | 1 | 1 | TBD | 2 |

Figure 9-X3 ((Protected) MAPC Response frame Action field format

The Category field is defined in 9.4.1.11 (Action field).

The Public Action/Protected Dual of Public Action field is defined in 9.6.7.1 (Public Action field) and in 9.6.10 (Protected Dual of Public Action frames).

The Dialog Token field is set to the same value as the Dialog Token field of the corresponding MAPC Request frame.

The Status Code field is defined in a TBD subclause (Status Code field). If the AP accepts the request, the Status Code field is set to SUCCESS . Otherwise, if the AP rejects the request, the Status Code field is set to TBD .

The AP ID field is defined in 9.4.1.X1 (AP ID field). If the Status Code field is equal to SUCCESS and the AP ID assignment is required, the AP ID field contains the assigned AP ID by the responding AP to the initiating AP. Otherwise, the AP ID field is reserved.

**9.6.10 Protected Dual of Public Action frame details**

***Make the following changes to Table 9-660 (A-MPDU contexts) (only relevant rows shown) as***

***follows and remove ANA assigned values from the list of reserved values:***

**Table 9-516—Public Action field values defined for Protected Dual of Public Action frames**

|  |  |  |
| --- | --- | --- |
| **Public Action**  **field value** | **Description** | **Defined in** |
| <ANA> | Protected MAPC Request | 9.6.7.55 (MAPC Request frame  format [Name and semantics are  TBD]) |
| <ANA> | Protected MAPC Response | 9.6.7.55 (MAPC Response frame  format [Name and semantics are  TBD]) |

**37.8.1.3.2 AP ID assignment**

A UHR AP shall follow the rules defined in this subclause additionally to the rules defined in 37.8.1.3

(MAPC agreement negotiation) to assign an AP ID to another AP with which it establishes a MAPC

Agreement and with the following constraints:

* + The AP ID is used for the AP to identify another AP as a coordinated AP, when necessary.
  + The AP ID and AID has the same size and range (as defined in 9.4.1.X1 (AP ID field ))
  + The AP ID value is not assigned by the AP or by its affiliated MLD to any other STA (e.g., STA is an associated non-AP STA, an unassociated non-AP STA that has been allocated a (Ranging session Identifier) RSID, or any other coordinated AP), or a non-AP MLD that is associated with the AP MLD.
  + It's TBD whether the AP ID value is greater than 2^n where n is the maximum of the value carried in the MBSSID Indicator (n) field of the Multiple BSSID element for any AP affiliated with the AP MLD that belongs to a multiple BSSID set.

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~~Details of AP ID assignment are TBD.~~

An initiating AP may assign an AP ID to the responding AP in MAPC Request frame, and the responding AP may assign an AP ID to the initiating AP in the MAPC Response frame .

# Text to be adopted ends here.

**References:**

1. [11-24-0171r21](https://mentor.ieee.org/802.11/dcn/24/11-24-0171-21-00bn-tgbn-motions-list-part-1.pptx): 11-24-0171-21-00bn-tgbn-motions-list-part-1, Alfred Asterjadhi (Qualcomm Inc.)