IEEE P802.11  
Wireless LANs

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| 11bi D1.0 Collision CRs | | | | |
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Abstract

This submission proposes resolutions for the following CIDs:

1066, 752, 213.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: scope reduction after 802.11bi meeting on 07/30.

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 TGbi D1.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbi D1.0 Draft. (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents). TGbi Editor: Editing instructions preceded by “TGbi Editor” are instructions to the TGbi editor to modify existing material in the TGbi draft. As a result of adopting the changes, the TGbi editor will execute the instructions rather than copy them to the TGbi Draft.***

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| **CID** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 1066 | 10.71.2.5 | 81.01 | This clause identies actions when an non-AP MLD's affilaited STA has an OTA MAC address that collides with another STA MAC address. However, there is no clarification of what to do if an AP MLD's MAC address collides with another STA's MAC address. | Provide mechanism to deal wit scenario where an AP MLD's MAC address collides with another STA's MAC address. | Revised  The case of a BPE AP MLD BSSID colliding with the MAC address of one or more of its associated non AP MLDs can be addressed by defining that the affected non AP MLD should apply the collision offset as in the regular CPE case. This case is handled with CID 213.  The AP BSSID collision with anything else cannot easily be detected, because the collision may be with the MAC of a legacy AP out of range of the BPE AP itself, but affecting a STA that is in between. If the STA is associated to the legacy AP, it has no way to know in advance that the collision will happen, thus the detection cannot be enforced. As such, it should be left for implementations.  TGbi editor to make the changes shown in the latest version of 11-25/1372 under all headings that include CID 213 |
| 213 | 10.71.2.5 | 82.22 | The collision warning should have rules for BPE STAs collision avoidance. The BPE AP address collision and a non-AP BPE STA address collisions should be considered separately. | Please add rules for BPE address collisions. | Revised  The scenario where the non-AP MAC, in a BPE scenario, collides with the MAC of another STA on a link is similar to the collision in the CPE case. 10.71.2.5 was written before the BPE scenario was developed, and adding the BPE case makes sense.  However, the BPE AP case is more difficult. It is possible to detect the collision of the future BSSID with the MAC of its associated STAs, and in that case the affected STA should change its MAC address, as it is lighter to change one STA than changing the BSSID value (which will affect all STAs, including those that are sleeping). But it is difficult to detect when the AP BSSID collides with anything else, because there may be for example other APs that are not in range of the colliding AP, but in range of the AP’s clients, and the AP has no way to detect those. Therefore dealing with such collision should not be in the Standard.  TGbi editor to make the changes shown in the latest version of 11-25/1372 under all headings that include CID 213 |
| 752 | 9.4.2.347 | 61.20 | The STA signals its DS MAC value, but there is no mechanism to avoid that the MAC collides with an existing address | Specify what happens if the signaled DS MAC already exists (or at least the AP knows it to exist) on the DS | Revised  The collision on the DS is beyond the scope of 802.11bi, because the AP may or may not know if the proposed DS MAC is actively used by another device. The AP may also have difficulties to detect if the DS MAC is reused by the same station, returning to the network, or a net-new station. Therefore, 802.11bi should not attempt to solve this case. TGbi editor: make this mention by making the changes shown in the latest version of 11-25/1372 under all headings that include CID 752 |

TGBI Editor: please implement the changes herein marked in red.

CID 1066, 213

Revised

**10.71.2.5 OTA MAC address collision avoidance**

An EDP (CPE or BPE) (#213) AP MLD and an EDP (CPE or BPE) non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames they transmit to each other (#555, 121).

An EDP ~~CPE~~ AP MLD shall determine whether the OTA MAC address that an EDP ~~CPE~~ non-AP MLD will use in a subsequent epoch will cause a collision with its associated AP MLD BSSID (#213), the OTA MAC address of another non-AP MLD(s) or another STA (#556, 92, 288) on a link (#1067, 214). When such a collision risk is anticipated with the OTA MAC of a non-CPE or non-BPE STA or non-AP MLD (#91, 350), the EDP ~~CPE~~ AP MLD shall send to the EDP ~~CPE~~ non-AP MLD an OTA MAC Collision Notification (#558) frame before the epoch when (#349) the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the EDP ~~CPE~~ (#91) non-AP MLD to apply the non-AP MLD specific FA parameters (#1068) epoch offset signaled in the AP MLD OTA MAC Collision Notification frame to avoid address collision. When such a collision risk is anticipated (#350) with the MAC address of a EDP ~~CPE~~ STA affiliated with a EDP ~~CPE~~ non-AP MLD, the AP shall send the OTA MAC Collision Notification (#558) frame to both EDP ~~CPE~~ STAs affiliated with the EDP ~~CPE~~ non-AP MLDs (#91, 811, 93)).

In general, the operation is as follows. If the collision is expected to occur m epochs after the current epoch, then the EDP ~~CPE~~ AP MLD sends an OTA Collision Warning element to the EDP ~~CPE~~ non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset field (#559) set to n, where n is the epoch count that the non-AP MLD is requested to skip. The EDP ~~CPE~~ AP MLD is therefore requesting that for the epoch occurring after m epochs, the EDP ~~CPE~~ AP MLD uses (#94) the EDP ~~CPE~~ non-AP MLD FA parameters that the EDP ~~CPE~~ non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then (#94), in the subsequent epoch, the EDP ~~CPE~~ non-AP MLD is expected to use the EDP ~~CPE~~ non-AP MLD FA parameters (#1068) that the EDP ~~CPE~~ non-AP MLD had planned to use m+n+1 epochs later, unless the EDP ~~CPE~~ AP MLD also signals a collision notification for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification (#558) frame. A non-AP MLD that received an OTA MAC Collision Notification frame (#812) shall respond with an OTA MAC Collision Response frame with the Collision Status field set to either 1 (#94, 289, 290), accepting the EDP ~~CPE~~ AP MLD proposed remediation, thus applying the offset requested by the EDP ~~CPE~~ AP MLD, or 2 (#94, 289, 290), rejecting the EDP ~~CPE~~ AP MLD proposed remediation, (#970) thus using the EDP ~~CPE~~ non-AP MLD FA parameters(#1068) that the EDP ~~CPE~~ non-AP MLD had planned to use for that epoch before receiving the EDP ~~CPE~~ AP MLD OTA MAC Collision Notification (#558) frame. The AP may not accept traffic from, or forward traffic to, a EDP ~~CPE~~ STA affiliated with the non-AP MLD that rejected the proposed remediation for the affected link, during the epoch when the collision occurs. Alternatively, the AP may disassociate a EDP ~~CPE~~ non-AP MLD that rejected the proposed remediation (#91).

NOTE – A non-AP MLD might decline to apply the requested offset for procedural reasons, e.g., the inability to skip epoch FA parameter sequences, or internal privacy configuration or policy reasons (#560).

NOTE – Detection and remediation of a BPE AP MLD BSSID collision with MAC addresses other than the BPE AP MLD associated non-AP MLDs is outside the scope of this standard. (#213)

CID 752

Revised

**12.16.6 (Re)Association Request/Response Frame Encryption**

This subclause defines rules to encrypt the Frame Body field of the (Re)Association Request/Response frame and to include a DS MAC Address element in the encrypted (Re)Association Request frame.

An EDP STA that sets the (Re)Association Frame Encryption Support field in the RSNXE to 1 shall set the MFPC subfield in the RSN Capabilities field in the RSNE to 1.(#167)

**12.16.6.1 Non-MLO procedure**(#945)

An EDP non-AP STA that sets the (Re)Association Frame Encryption Support field in the RSNXE to 1 shall indicate a pairwise cipher, establish a PTKSA, and derive a temporal key (TK) through Authentication frame exchange with an EDP AP that sets the (Re)Association Frame Encryption Support field in the RSNXE to 1 (see 12.16.8 (Key derivation with Authentication frame exchange) and 12.16.9 (Enhanced Data Privacy Key Exchange)).(#849)

…/…

The EDP non-AP STA may randomize the DS MAC address. To construct a random DS MAC address, the EDP non-AP STA shall select the randomized DS MAC address according to IEEE Std 802-2014 and IEEE Std 802c-2017. If dot11DSMACAddressActivated is true, the EDP non-AP STA shall use the same DS MAC address for the duration of its connection across an ESS.

NOTE – Detection and remediation of possible DS MAC address collisions are outside the scope of this standard.

**12.16.6.2 MLO procedure**

…/…

An EDP non-AP MLD may randomize its DS MAC address. To construct a random DS MAC address, the EDP non-AP MLD shall select the randomized DS MAC address according to IEEE Std 802-2014 and IEEE Std 802c-2017. If dot11DSMACAddressActivated is true, the EDP non-AP MLD shall use the same DS MAC address for the duration of its connection across an ESS.

NOTE – Detection and remediation of possible DS MAC address collisions are outside the scope of this standard.