IEEE P802.11
Wireless LANs

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| Resolution for CID 3165 |
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Abstract

This submission proposes resolutions for the comment CID 3165 from comment collection on P802.11-REVme D2.0.

# Revision Notes

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| R0 | Initial revision  |
| R1 | Document name updated |
| R2 | Added few comments |

# CID 3816

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| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 316511.1.3.12338 | Unicast beacons can efficiently serve some 802.11 deployment use cases. | The Address 1 field of the Beacon or Timing Advertisement frame may be set to the broadcast address or a unicast address. |

**Discussion**:

1. Unicast beacon overview

Section 11.1.3.1 (Maintaining synchronization) of REVme D2.0 states that “A non-DMG STA sending a Beacon, Timing Advertisement, or Probe Response frame, or a TIM frame with a TSF timestamp, shall set the frame’s Timestamp field so that it equals the value of the STA’s TSF timer at the time that the start of the data symbol containing the first bit of the Timestamp field appears at the transmit antenna connector. **The Address 1 field of the Beacon or Timing Advertisement frame shall be set to the broadcast address.”**

While the Address 1 field of beacons are set to the broadcast address for most deployments, some Wi-Fi deployment use cases benefit from an Address 1 field of beacons set to a unicast address.

For example, car software upgrades require high level of privacy. On top of using the latest WPA3, a user may configure his AP with a SSID solely dedicated to his car software upgrade and another SSID with WPA3 personal transition mode to serve all other devices in the home. When the presence of the vehicle is detected by the AP (out of 802.11 scope) in the user’s residence, the AP sends unicast beacons to the vehicle, enabling the vehicle to associate to the home AP. The car performs software updates and upload/download data (e.g., entertainment, telemetry) to the car manufacturer’s platform. When the car notifies the AP that the operation is completed (out of scope of 802.11), the AP tears down the session and stops advertising the unicast SSID.

The use of unicast beacons allows the AP to adapt the MCS rate to the channel condition between the AP and the non-AP STA, reducing the impact of beacon airtime utilization.

The use of unicast beacons has been validated w/o any HW/SW changes with several clients available on the market including laptops and mobile phones running different OSs.

This submission proposes to enable the use of unicast beacons and related management frames. The support for unicast beacons and related management frames shall be optional for non-S1G and non-DMG APs and non-AP STAs. The support for broadcast beacons and related management frames remains mandatory for APs and non-AP STAs.

1. Related management frames

802.11-20/0435r14 - CID 4432 states that "The Address 1 field of the TIM frame shall be set to the broadcast address." -- equivalent statements are needed for other Management frames that are always broadcast e.g., Beacon, FILS Discovery frames”.

CID 4432 lists the management frames that are already explicitly specified in REVmd D3.0 to be transmitted as broadcasts (TIM and Measurement Pilots”) and lists the management frames where “broadcast address” must be added (FILS Discovery frame, Beacon frame, Timing Advertisement frame, Channel Switch Announcement frame, Extended Channel Switch Announcement frame).

Management frames listed above should be permitted to set the address 1 field to the unicast address.

**Proposed changes:**

Section 11.1.3.1 (Maintaining synchronization) (line 5 – refers to non-DMG STA): Replace “The Address 1 field of the Beacon or Timing Advertisement frame shall be set to the broadcast address.” by “The Address 1 field of the Beacon or Timing Advertisement frame shall be set to the broadcast address (mandatory support by STAs) or a unicast address (optional support for non-S1G STAs).”

Section 11.2.3.15 (TIM Broadcast) (line 55 before the end of the section): Replace “The Address 1 field of the TIM frame shall be set to the broadcast address.” by “The Address 1 field of the TIM frame shall be set to the broadcast address (mandatory support by STAs) or a unicast address (optional support for non-S1G STAs).”

Section 11.46.2.1 FILS Discovery frame transmission (line 35): Replace “The Address 1 field of the FILS Discovery frame shall be set to the broadcast address.” by “The Address 1 field of the FILS Discovery frame shall be set to the broadcast address (mandatory support by STAs) or a unicast address (optional support for non-S1G STAs).”

Section 11.8.8.1 General (line 1): Replace “The Address 1 field of a Channel Switch Announcement frame shall be set to the broadcast address.” by “The Address 1 field of a Channel Switch Announcement frame shall be set to the broadcast address (mandatory support by STAs) or a unicast address (optional support for non-S1G STAs).”

At the end of 11.9.1 General (in 11.9 Extended channel switching (ECS)) (line 5): Replace “The Address 1 field of an Extended Channel Switch Announcement frame shall be set to the broadcast address.” By “The Address 1 field of an Extended Channel Switch Announcement frame shall be set to the broadcast address (mandatory support by STAs) or a unicast address (optional support for non-S1G STAs).”

Section 11.10.15.2 Measurement Pilot frame generation by an AP(p2526 line 54):Replace **“**An AP shall transmit Measurement Pilot frames to the broadcast address.” by **“**An AP shall transmit Measurement Pilot frames to the broadcast address (mandatory support by STAs) or a unicast address (optional support for non-S1G STAs).”

**Reference:**

[1] 802.11-20/0435r14 – “Resolutions for some comments on 11md/D3.0 (SB1)”