IEEE P802.11
Wireless LANs

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| Proposed Resolution for CID 193 (BSS Color Disable Indication) |
| Date: 2016-11-07 |
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Abstract

This submission proposes resolution for CID 193

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. This introduction is 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** | **Commenter** | **Pg / Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 193 | Alfred Asterjadhi | 25.11 | There may be cases where multiple APs have selected the same BSS Color as such a STA in rare occasions may happen to decide and go in doze state during the wrong PPDU. Enable the AP to turn off intra-PPDU PS based on BSS Color. | As in comment. | Accept.Please see contribution in document 11-16-1413-04ax |

Discussion:

High likelihood that 2 APs select the same color in a dense environment

* Birthday Paradox problem says that with ~8 APs, there is a 50% change that 2 of them select the same color

If BSS Color collision is not handled, it can cause:

* STAs to incorrectly set TXOP/NAV values
* STAs to incorrectly enter power-save mode and missing frames from its AP

Therefore, it is critical for an HE APs to:

* Detect and avoid BSS color overlap
* Signal associated STAs that there is BSS color overlap
* If needed, switch to a new color (see doc 11-16/1415)

The proposed resolution is to disable BSS Color when AP determines that there is a color collision.

The AP may need to disable BSS Color for other reasons (such as an operator reorganizing a managed network). The proposed text language tries to be general so that it covers other situations that are not covered in the comment.

## 25.11 TXVECTOR parameters STA\_ID\_LIST, UPLINK\_FLAG and BSS\_COLOR for an HE PPDU

### 25.11.3 BSS\_COLOR

TGax Editor: *Please add the underline at the end of this section:*

An AP that decides to discontinue the use of the BSS color for the BSS that it serves, for example, after detecting a BSS Color overlap with an OBSS shall set the value of BSS Color Disabled subfield in the HE Operation element to 1 to inform associated STAs that the BSS Color is disabled; otherwise the AP shall set the BSS Color Disabled subfield to 0. The mechanism by which an HE AP decides to discontinue the use of the BSS color, such as how the HE AP detects BSS Color overlap, is beyond the scope of this standard.

If the most recently received HE Operation element from the AP to which it is associated contained a value of 1 in the BSS Color Disabled subfield then:

* A HE non-AP STA should use the A1, A2 and Duration/ID fields of the MPDUs contained in the received PPDUs instead of the BSS\_COLOR and TXOP\_Duration field in the HE SIG A field to determine whether the STA should update the Intra-BSS NAV.
* A HE non-AP STA should use the A1, A2 of the MPDUs contained in the received PPDUs instead of the BSS\_COLOR and STA\_ID\_LIST field in the HE SIG A field to determine whether the STA may go to doze state for the duration of that PPDU (see 25.2.1 (Intra-BSS and inter-BSS frame detection), 25.2.2 (Updating two NAVs), and 25.15.1 (Intra-PPDU power save for HE non-AP STAs)).

The HE non-AP STA may use the BSS COLOR if the most recently received HE Operation element from the AP to which it is associated contained a value of 0 in the BSS Color Disabled subfield.

TGax Editor: *Please update this section with the underlined changes:*

**9.4.2.219 HE Operation element**

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B5 | B6 B8 | B9 | B10 B19 | B20 | B21 | B22 B31 |
|  | BSS Color | Default PE Duration | TWT Required | HE Duration based RTS Threshold | Partial BSS Color | BSS Color Disabled | Reserved |
| Bits: | 6 | 3 | 1 | 10 | 1 | 1 | 10 |

Figure 9‑589cr - HE Operation Parameters field format

The BSS Color Disabled subfield indicates whether the transmitting AP recommends the associated STAs to disable the use of BSS Color parameter in PPDU power save and to set Intra NAV logic. An HE AP sets the BSS Color Disabled subfield to 1 if the HE AP decides to disable the use of the BSS color for the BSS that it serves, for example, after detecting a BSS Color overlap in the neighborhood as described in 25.11.3 (BSS\_COLOR); otherwise the HE AP sets the BSS Color Disabled subfield to 0.

If an HE non-AP STA receives from associated AP a BSS Color Disabled subfield value equal to 1 in the HE Operation element the HE non-AP STA disables use of BSS Color parameter in PPDU power save and Intra NAV logic that depend exclusively on BSS Color (see details in section 25.11.3). HE non-AP STA may re-enable BSS Color related features once it receives from the associated AP a BSS Color Disabled subfield equal to 0 in an HE Operation element.