IEEE P802.11
Wireless LANs

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| CID 5096 Comment Resolution |
| Date: 2012-03-15 |
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|  |  |  |  |  |

Abstract

This document provides resolution to comment CID 5096.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 5096 | Sigurd Schelstraete | 143.54 | 10.38.5 | Sending VHT Operating mode notification in Group-addressed frames does not allow for explicit ackowledgments. | When the VHT Operating mode notification is sent in Group-addressed frames, the sender can not get acknowledgements. This makes it even harder to infer whether the intended recipients have processed the requested changes.Should it be required that the VHT Operating Mode Notification be sent in individually addressed frames only? |

**Discussion**

Agree in general that it is not clear how an AP can make use of the VHT Operating Mode Notification frame to signal the changes of operating modes to all STAs in the BSS.

Based on the current specification, this frame is the only way for a STA, including AP, to signal the change of Rx Nss. Even if an AP is able to broadcast the frame to all associated STAs to announce its change of Rx Nss, it still needs to send an additional frame to every newly joined STA to indicate the current Rx Nss.

It is beneficial to allow an AP to announce its Operating Mode changes, esp. Rx Nss change, by using beacons and probe responses. One easy way to enable this option is to define a new Operating Mode Notification element which including the same VHT Operating Mode field as included in the VHT Operating Mode Notification frame.

A non-AP STA can also include this new element in Association Request to indicate its desired operating modes after the association process.

Since a VHT STA can only operate as HT STA mode in 2.4GHz band, it will be good if the operating mode notification feature can be extended also to HT STAs. One reserved bit in the HT Extended Capabilities field can be used to indicate whether a STA is able to process the VHT Operating Mode Notification frame/element.

**Proposed resolution:**

REVISE, TGac editor to make changes found in document 11-12/xxxxr0 under the heading “proposed text changes for CID 5096”

**Proposed text changes for CID 5096:**

***TGac Editor***: Please change all “VHT Operating Mode” to “Operating Mode”

***TGac Editor:*** Please add an “Operation Mode Notification” row to Table 8-103 Capabilities field within 8.4.2.29 Extended Capabilities Element.

|  |  |  |
| --- | --- | --- |
| Bit | Information | Notes |
| <ANA> | Operating Mode Notification | If dot11OperatingModeNotificationImplemented is true, the Operating Mode Notification field is set to 1 to indicate support for reception of the Operating Mode Notification element and the Operating Mode Notification frame.If dot11OperatingModeNotificationImplemented is false or not present, the Operating Mode Notification field is set to 0 to indicate lack of support for reception of the Operating Mode Notification element and the Operating Mode Notification frame. |

***TGac Editor: Please add a new element “Operating Mode Notification element” as shown:***

**8.4.2.xxx Operating Mode Notification element**

The Operating Mode Notification element is used to notify STAs that the transmitting STA is changing its operating channel width, the maximum number of spatial streams it can receive, or both. The format of the Operating Mode Notification element is defined in Figure 8-xxx.

|  |  |  |
| --- | --- | --- |
| Element ID | Length | Operating Mode |
| 1 | 1 | 1 |

Figure 8-xxx – Operating Mode Notification element

The Operating Mode field is defined in 8.4.1.49 (~~VHT~~ Operating Mode field).

***TGac Editor: Please add the following row to Table 8-20 (Beacon frame body), Table 8-22 (Association Request frame body), Table 8-23 (Association Response frame body), Table 8-24 (Reassociation Request frame body), Table 8-25 (Reassociation Response frame body) and Table 8-27 (Probe Response frame body):***

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <Editor to assign next available order> | Operating Mode Notification element | The Operating Mode Notification element is optionally present when the dot11OperatingModeNotificationImplemented attribute is true. |

***TGac Editor: Please modify subclause 10.38.5 as shown:***

**10.38.5 Notification of operating mode changes**

A STA that has the value true for dot11OperatingModeNotificationImplemented shall set the Operating Mode Notification field in the Extended Capabilities Element to 1. A VHT STA shall set dot11OperatingModeNotificationImplemented to true.

A STA notifies other STAs that are operating mode notification capable of a change in its operating mode using the Operating Mode Notification Action frame or by including the Operating Mode Notification element in the Beacon, Probe Response, Association Request, Association Response, Reassociation Request, or Reassociation Response frames. The Operating Mode field in the Operating Mode Notification frame or the Operating Mode Notification element is set to indicate that the STA is capable of receiving frames with a bandwidth up to and including the indicated channel width and with a  *number of spatial streams* up to and including the indicated Rx Nss.

A STA shall not transmit a frame that contains the Operating Mode field to one or more STAs unless all intended receiving STAs set the Operation Mode Notification field to 1 in the Extended Capabilities Element.

An HT AP that is not a VHT AP that transmits the Operating Mode Notification element shall set the value of the Channel Width subfield in Operating Mode Notification element to indicate the same channel width as the STA Channel Width subfield in the HT Operation element.

A VHT AP that transmits the Operating Mode Notification element shall set the value of the Channel Width subfield in Operating Mode Notification element to indicate the same channel width as the Channel Width subfield in the VHT Operation element and STA Channel Width subfield in the HT Operation element (see Table 10-19a (VHT BSS operating channel width).

***TGac Editor: Please modify C.3 MIB Detail as shown:***

**C.3 MIB Detail**

***Change Dot11StationConfigEntry, appending dot11VHTOptionImplemented as follows:***

dot11BSSBroadcastNullCount Unsigned32,

dot11VHTOptionImplemented TruthValue,

dot11OperatingModeNotificationImplemented TruthValue

}

***Insert the following after the dot11MeshActivated OPJECT-TYPE element in the Dot11StationConfig***

***TABLE:***

dot11VHTOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute indicates whether the entity is VHT Capable."

::= { dot11StationConfigEntry 137}

dot11OperatingModeNotificationImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute indicates whether the entity is Operating Mode Notification Capable."

::= { dot11StationConfigEntry 138}