IEEE P802.11
Wireless LANs

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| First Recirc Sponsor ballot - proposed resolution for comments assigned to the author (Peter Ecclesine) |
| Date: 2016-05-13 |
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| Dongguk Lim, Hangyu Cho, Minseok Oh | LTE |  |  |  |

Abstract

This document contains proposed resolutions to SB1 comment assigned to the author.

R0: CID 7220, discussed February 25, 2016 BRC and text revised.

R1: Added proposed resolution to CIDs 7102, 7121, 7123, 7170 and 7676 after discussion in February 25, 2016 BRC and resolution assignments from MAC comments leader Mark Hamilton. Changed resolution text baseline to REVmc Draft 5.2.

R2: discussed March 17, 2016 BRC and CID 7170 resolution text revised. Added proposed resolution for CID 7103 in cooperation with Dongguk Lim, Hangyu Cho and Minseok Oh.

R3: CID 7170 proposed resolution revised after email discussions. Removed Public Action frame and changed name to future channel guidance.

R4: CID 7220 changed text during May 13 BRC teleconference.

# Comments owned by MAC

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| 7102 | 1876.39 | 11.40.4 |  | "NOTE 1--Other means to switch the BSS bandwidth are described in 11.42 (Notification of operating mode changes)." -- this note is incorrect. Operating mode changes are not the same as BSS bandwidth changes. | Delete cited note. |  | MAC |

**Discussion**

SB1 CID 7102 on Channel switching methods for a VHT BSS text in Note 1 requests to delete Note 1 because operating mode changes are not relevant to Channel switching methods in a VHT BSS. We agree.

**Proposed Resolution**

Accepted. Make changes under CID 7102 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

*At [5.2]1912.28 in 11.40.4, delete Note 1.*

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| 7103 | 1883.25 | 11.43 |  | "B0-B1 (BW) in TVHT-SIG-A1"- the MAC has no knowledge of the contents of particular signal fields in the PHY (rightly so). | Reword so that this refers only to TXVECTOR/RXVECTOR parameters. |  | MAC |

**Discussion**

SB1 CID 7103 on TVHT BSS bandwidth requests to change the table to only refer to TXVECTOR/RXVECTOR parameters. We agree.

Clause 11.43 in REVmc\_D5.2 describes how to set the channel width field in TVHT operation field to indicate the BSS BW and Transmit mode base on BW in TXVECTOR/RXVECTOR parameters. So, when this parameter is being set, we have to use a TXVECTOR parameter. In clause 22.2.3 **Effects of CH\_BANDWIDTH parameter on PPDU format**, we defined the relation between PPDU format and CH\_BANDWIDTH of TXVECTOR/RXVECTOR. So, the column B0-B1 (BW) in TVHT-SIG-A1 in table 11-26 is not relevant.

**Proposed Resolution**

Revised. Make changes under CID 7103 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

*At [5.2]1919.21 in 11.43, delete the third column B0-B1 (BW) in TVHT-SIG-A1 in table 11-26.*

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| 7121 | 1346.53 | 10.21.4 |  | "When communicating with a STA that supports global operating classes" - this is an informal condition in a normative statement. | Replace informal condition with condition based on observables. |  | MAC |

**Discussion**

SB1 CID 7121 on Operating with multiple operating classes text, requests to list the conditions that show the other STA supports global operating classes. We agree. Probe Request frames and Authetication Request frames received with a Supported Operating Classes element field with Operating class values that are any of the non-reserved values in Table E-4 Global operating classes indicates that the sending STA has some support for global operating classes.

**Proposed Resolution**

Revised. Make changes under CID 7121 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

*At [5.2]42.44 in 3.2* **Definitions specific to IEEE Std(#130) 802.11***, insert new definition as follows:*

**global operating class:** an operating class value that is any of the non-reserved values in Table E-4.

*At [5.2]1346.52 in 10.21.4 Operation with multiple country elements, insert text as follows:*

Probe Request frames and Authetication Request frames received with a Supported Operating Classes element field with any global operating class value indicate that the sending STA supports global operating classes.

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| 7123 | 1675.12 | 11.9.8.3 |  | "each STA in an IBSS is required to detect radar" - it needs to be clear that 802.11 does not create these requirements | Change "is required" to "is required by regulation" |  | MAC |

**Discussion**

SB1 CID 7123 on Selecting and advertising a new channel in an IBSS text, requests to make clear the standard does not require each STA in an IBSS to detect radar, rather regulations in radar bands make the requirement. We agree.

**Proposed Resolution**

Revised. Make changes under CID 7123 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

*At [5.2]1705.53 in 11.9.8.3, change as shown:*

“In some regulatory domains, each STA in an IBSS is required by regulation to detect radar and …”

*At [5.2]1780.61 in 11.23.6.2, change as shown:*

The TDLS peer STA initiating the switch to the channel where radar detection is required by regulation shall be the DFS owner.

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| 7170 | 743.47 | 9.4.2.19 |  | In some DFS bands it is important to close the channel as quickly as possible, and one means is to indicate well ahead of time the future preferred channel, so STAs know which channel the Master intends to migrate the BSS. The Channel Switch Mode field should also have a value to indicate a future preferred channel switch target channel so if the AP or DFS owner ceases transmission on this channel, the other STAs know where to scan next for the beaconing STA. | See 802.11-15/828r8 proposed resolutions of SB0 CIDs 5969, 5970 and 5972 for the proposed text changes. |  | MAC |

**Discussion**

SB1 CID 7170 on channel switch announcements apply to text defining values for guidance about the next likely channel that a beaconing station will use if it ceases transmission on this channel in a restricted band e.g., the 5 GHz radar bands. For background on restricted bands and client restrictions, see <https://mentor.ieee.org/802.11/dcn/12/11-12-1159-03-00ai-masers-slaves-and-clients.pptx> . In some restricted bands, an unassociated STA can only transmit to achieve association, so it passively scans, choses a STA to associate to, then authenticates and associates. From the moment of first transmission, it operates under the control of the STA it is transmitting to. In an MBSS the Channel Switch Mode field is reserved, consequently new text for giving DFS guidance is required.

**Proposed Resolution**

Revised. Make changes under CID 7170 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

ANA Resources required: Beacon Frame Order for Future Channel Guidance, Association Response order for Future Channel Guidance, Reassociation Response order for Future Channel Guidance, Element ID Extension for Future Channel Guidance, Extended Capabilities bit for Future Channel Guidance, dot11StationConfigEntry for dot11FutureChannelGuidanceActivated.

*At [5.2]19.56 in 3.1 Definitions, delete the unused and 802.11y specific definition of restricted channel.*

*At [5.2]30.52 in 3.2* **Definitions specific to IEEE Std(#130) 802.11***, insert new definition as follows:*

**future channel guidance:** future channel guidance communicates likely future channel information so that STAs can efficiently move their activity when the absence of Beacon frames is noticed.

*At [5.2]639.35 Table 9-27 Beacon frame body, insert new Future Channel Guidance order as follows:*

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <ANA> | Future Channel Guidance | The Future Channel Guidance element is optionally present if dot11FutureChannelGuidanceActivated is true. |

*At [5.2]643.32 Table 9-30 Association Response frame body, insert new Future Channel Guidance order as follows:*

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <ANA> | Future Channel Guidance | The Future Channel Guidance element is optionally present if dot11FutureChannelGuidanceActivated is true. |

*At [5.2]647.42 Table 9-32 Reassociation Response frame body, insert new Future Channel Guidance order as follows:*

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <ANA> | Future Channel Guidance | The Future Channel Guidance element is optionally present if dot11FutureChannelGuidanceActivated is true. |

*At [5.2]740.21 Table 9-76 Element IDs, insert new element as follows:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | Element ID | Element ID Extension | Extensible | Fragmentable |
| Future Channel Guidance | 255 | <ANA> |  | No |

*At [5.2]856.37 Table 9-134 Extended Capabilities field, insert new extended capability field as shown:*

|  |  |  |
| --- | --- | --- |
|  Bit | Information  | Notes |
| <ANA> | Future Channel Guidance | The STA sets the Future Channel Guidance field to 1 when dot11FutureChannelGuidanceActivated is true and sets it to 0 otherwise. See 11.9.10 Future Channel Guidance operation. |

*At [5.2]1093.07 before 9.4.3 Subelements, insert text as follows:*

9.4.2.175 Future Channel Guidance element

Future Channel Guidance element is used by an AP, IBSS STA, mesh STA, or PCP to guide STAs about the likely future channel if the sending STA changes channels of operation. The format of the Future Channel Guidance element is shown in Figure 9-586a.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element ID Extension | New Channel Number | Secondary Channel Offset element | Mesh Channel Switch Parameters element | Wide Bandwidth Channel Switch element | New Transmit Power Envelope element |

Octets 1 1 1 1 0 or 3 0 or 6 0 or 5 variable

**Figure 9-586a—Future Channel Guidance element format**

The Element ID, Length and Element ID Extension fields are defined in 9.4.2.1.

The New Channel Number field is set to the number of the channel to which the STA will be moving in the event of a channel switch (as defined in 17.3.8.4.3).

The Secondary Channel Offset element is defined in 9.4.2.20. This element is present when switching to a 40 MHz or wider channel. It is optionally present when switching to a 20 MHz channel (in which case the Secondary Channel Offset field is set to SCN); see 11.40.4).

The Mesh Channel Switch Parameters element is defined in 9.4.2.103. This element is present when a mesh STA performs MBSS channel switch. Otherwise, the Mesh Channel Switch Parameters element is not present.

The Wide Bandwidth Channel Switch element is defined in 9.4.2.161. This element is present when switching to a channel width wider than 40 MHz.

Each New Transmit Power Envelope element that is present is defined to have the same format as the Transmit Power Envelope element (see 9.4.2.162) and includes a distinct value of the Local Maximum Transmit Power Unit Interpretation subfield. If present, the New Transmit Power Envelope element indicates the local maximum transmit powers for the BSS for the BSS for the indicated bandwidths with an indicated unit interpretation after channel switching (see 11.40.1).

The Future Channel Guidance procedure is defined in 11.9.10.

*At [5.2]1699.29 in 11.9.1 DFS procedures, General, change text as shown:*

A STA shall use the DFS procedures defined in 11.9.1 (General) to 11.9.9 (Channel Switch Announcement element operation) if dot11SpectrumManagementRequired is true.

A STA shall use the DFS procedures defined in 11.9.10 if dot11SpectrumManagementRequired and dot11FutureChannelGuidanceActivated are true.

*At [5.2]1699.51 11.9.1 DFS procedures, General, insert new text as follows:*

* Guiding STAs about the likely future channel should the AP leave this channel (see 11.9.10)

*At [5.2]1710.36, before 11.10 Extended channel switching, insert text as follows:*

11.9.10 Future Channel Guidance operation

This subclause defines a mechanism to create, communicate and act on the Future Channel Guidance element.

When dot11FutureChannelGuidanceActivated is true, a STA shall follow these procedures for Future Channel Guidance operation.

A STA transmitting Beacon frames transmits the Future Channel Guidance element in (Re)Association Response frames and optionally in Beacon frames.

In some bands, the channel clearing time will be much less than one second for all STAs, and future channel guidance permits all STAs know what channels will be used if the current channels are cleared.

In some bands, Beacon frames are an enabling signal, and some STAs are not allowed to transmit in the band before receiving an enabling signal. When Beacon frame reception stops, some STAs are no longer enabled to transmit in the band. In these bands, when Beacon frame reception stops, it is an implicit message to switch from current channels to other channels according to prior future channel guidance.

Future channel guidance indicates future channels that the Beaconing STA switches to while maintaining associations and mesh peering relationships (see 11.9.8.2, 11.9.8.3, 11.9.8.4.2, 11.9.8.6, 11.10.3.2, 11.10.3.3 and 11.10.3.4).

A STA receiving the Future Channel Guidance element shall retain the information until it receives a different Future Channel Guidance element from the same STA, it receives a Channel Switch Announcement element or a Channel Switch Announcement frame from the same STA, or it chooses alternative action. For example, it may choose to move to a different BSS.

*At [5.2]2819.28 Table B.4.10 Spectrum management extensions, insert text as follows:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | IUT configuration | References | Status | Support |
| SM20.10 | Transmission of Future Channel Guidance element by a STA | 11.9.10 (Future Channel Guidance operation) | CFSM:O | Yes  No  N/A  |
| SM20.11 | Reception of Future Channel Guidance element procedure by a STA | 11.9.10 (Future Channel Guidance operation) | CFSM:O | Yes  No  N/A  |

*At [5.2]2953.62 in Dot11StationConfigEntry, insert the last entry as follows:*

dot11VHTExtendedNSSBWCapable TruthValue,

dot11FutureChannelGuidanceActivated TruthValue

*At [5.2]2975.03 insert the following new element at the end of the dot11StationConfigEntry table:*

dot11FutureChannelGuidanceActivated OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a control variable.

 It is written by an external management entity or the SME. Changes

 take effect as soon as practical in the implementation.

 This attribute, when true, indicates the capability of the STA to support

 Future channel guidance procedures is enabled. The capability is disabled

 otherwise."

 DEFVAL {false}

 ::= { dot11StationConfigEntry <ANA> }

*At [5.2]3435.55 in dot11SMTbase13 after the last named object, change text to add dot11FutureChannelGuidanceActivated as shown:*

dot11EstimatedServiceParametersOptionImplemented,

 dot11FutureChannelGuidanceActivated

}

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| 7220 | 743.26 | 9.4.2.19 |  | It is not clear whether a STA that receives a Channel Switch Mode of 1 ("shut up immediately") may continue to transmit to devices outside the BSS.  Perhaps not in a non-DMG infraBSS ("The AP may force STAs in the BSS to stop transmissions until the channel switch takes place by setting the Channel Switch Mode field in the Channel Switch Announcement element to 1.", and more weakly "The AP may request STAs in the BSS to stop transmissions until the channel switch takes place by setting the Extended  Channel  Switch  Mode  field  to  1  in  the  Extended  Channel  Switch  Announcement  element.") but yes in an IBSS ("The DFS owner may attempt to silence STAs in the IBSS until the channel switch takes place using the Channel Switch Mode field in the Channel Switch Announcement element." and " An IBSS STA may treat a Channel Switch Mode field equal to 1 as advisory") or a DMG BSS ("A [DMG] STA may ignore the Channel Switch Mode field", though this is contradicted by "If a STA in a BSS that is not an IBSS receives a Channel Switch Mode field that has the value 1, it shall not transmit any more frames to STAs in the BSS until the scheduled channel switch occurs.")? | Use clearer wording to express what appears to be the intent: non-DMG infra STA shall shut up, DMG or IBSS STA may continue to babble. |  | MAC |

**Discussion**

SB1 CID 7220 on channel switch announcement description text notes the contradiction that STAs that are not DFS owners in DFS bands should follow control elements from the DFS owner or leave the BSS. Commenter asks after receipt of Channel Switch Mode value of 1, can a STA continue to transmit to devices outside the BSS? For background on restricted bands and client restrictions, see <https://mentor.ieee.org/802.11/dcn/12/11-12-1159-03-00ai-masers-slaves-and-clients.pptx> . We propose clearer wording to express that receipt of a Channel Switch Announcement with Channel Switch Mode value of 1, a non-DMG infrastructure STA shall not transmit, but a DMG or IBSS STA are not constrained.

**Proposed Resolution**

Revised. Make changes under CID 7220 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

*At [5.2]1710.29 11.9.9 Channel Switch Announcement element operation, change as shown:*

“If a non-DMG STA in a BSS that is not an IBSS or MBSS receives a Channel Switch Mode field that has the value 1, it shall not transmit any more frames on the channel ~~to STAs in the BSS~~ until the scheduled channel switch occurs; otherwise a STA may treat a Channel Switch Mode field equal to 1 as advisory.”

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| 7676 | 716.05 | 9.4.1.53 |  | Because of 4.3.13, this table applies to TVHT STAs too unless stated otherwise | Add "non-TVHT" after "VHT" |  | MAC |

**Discussion**

SB1 CID 7676 on the heading of Table 9-74 **Table 9-74—Setting of the Channel Width subfield and Dynamic Extended NSS BW subfield at a VHT STA transmitting the Operating Mode field** notes that it does not apply to TVHT STAs, so the title should be changed. We agree.

**Proposed Resolution**

Accepted. Make changes under CID 7676 in <this-document>.

Editing instructions are based on REVmc Draft 5.2.

*At [5.2]727.01 in 9.4.1.53, change as shown:*

**Table 9-74—Setting of the Channel Width subfield and Dynamic Extended NSS BW subfield**

**at a VHT non-TVHT STA transmitting the Operating Mode field**