IEEE P802.11
Wireless LANs

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| LB1000 CID5960 NSS support partitioning redux |
| Date: 2015-11-10 |
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Abstract

This document proposes some minor modifications to the accepted resolution for CID 5960 of LB1000 (first sponsor ballot), a comment on TGm Draft 4.0 suggesting the creation of additional partitioning of support indication for NSS values.

**REVISION NOTES:**

***Revisions to 11-15-1424:***

R0: initial – based on Draft4.3

R1: Added global change of “NSS BW Signaling Support” to “VHT NSS BW Signaling Support”

 Fixed revision number information in the header

***Revisions to 11-15-0654:***

R0: initial – beginning with 11-14-0793r9, including the following changes:

 In Rx Supported VHT-MCS and NSS Set and Tx Supported VHT-MCS and NSS Set, change the language to only require interpretation of the half NSS bit if the recipient of the bit is capable of interpreting the bit and in the new subclause Half Maximum NSS Support Signaling, remove the text that restricted the transmission of the half NSS signalling bits only to STA that have indicated support for interpretation of the bits. This change is needed because an AP for example, can broadcast capability in a beacon to all STA, both supporters and non-supporters and the interpretation of the half NSS bits are then left to the recipients of the bits. Those recipients that have the capability are required to interpret the value of 1 and those that do not have the capability are allowed to ignore the bits.

R1: providing the alternative, recipient determined setting of the capability bits

R2: yet another alternative, that allows both BW and NSS modifications to deal with the broadcast capability information problem that is created by previous alternatives – that is – if an AP sends VHT Capability information in a broadcast Beacon, then it is unclear whether the association response information will override the Beacon information at a non-AP STA that associates with the AP, so a different signalling method is proposed which allows the creation of a “secret” extended NSS and BW operational set which is only understood by STA that have the optional capability to understand these bits.

R3: remove some inserted text that mentioned basic channel width set

 Extended NSS BW Support bit description in the table – changed TVHT case to reserved and removed change marks, as this section is new text for insertion.

R4: reorder the entries in the tables, add another entry to cover a missing case

 Some simple capitalization issues repaired

R5: Remove paragraph that said that computation of Max VHT NSS field is computed assuming that the MIB variable is false – this is not necessary when the entire set of instructions for these fields is read together

R6: editorial fixes

R7: add an explicit definition of Max VHT NSS.

R8: split table for recipient in clause 9 based on MIB variable and include Operating Mode field’s Channel Width field in the column header

 Add explicit description of what is done for NSS value and Max VHT MCS for n SS values when Max VHT NSS is doubled

 Answer the question of whether the baseline allows BSS BW to exceed AP BW? (yes)

Add changes to Operating Mode field Rx NSS value

Add changes to 9.34.5.2 Rules for VHT sounding protocol sequences where NSS is referenced

Add changes to 10.4.2 TSPEC construction which references NSS

Add new field Dynamic Extended NSS BW field to Operating Mode field and associated table

Simplify language in 9.34.5.2 and 10.42

R9: Add a capability bit and language on behaviour of a STA that is capable of the new signalling and that associates with a STA that is not capable – such a STA may advertise the new capability but shall not use the new capability. This deals with the problem of a STA that understands the new capability but does not use an encoding that is distinguishable from a legacy encoding. An associating STA cannot distinguish such a NSS BW capable STA from a non NSS BW capable STA and therefore, is unable to determine whether the associated STA is capable of interpreting the new signalling bits that it uses. If the associated STA is not capable, then the associating STA should not use those NSS BW combinations of which it is capable, but that the associated STA is unaware. The changes add a bit to indicate support for the mechanism and adds behavioural rules in 10.40.8 Extended NSS BW Support Signaling and a note in the RX Supported VHT MCS and NSS and TX Supported VHT MCS and NSS subclauses.

R10: Add ¾ mode

R11: Fix some inconsistencies and details that had problems as pointed out by Mark Rison

R12: Fix a few more things – TVHT Dynamic Extended NSS BW field is reserved. Operating mode field table entry for Channel Width is adjusted to point to new table for VHT STA case.

R13: Make the Extended NSS BW and Dynamic Extended NSS BW fields reserved depending on the Extended NSS BW Capable subfield value. i.e. add the phrase “For a VHT STA with VHT Extended NSS BW Support set to 0, this field is set to 0”

R14: Modify MIB variable name and editing instruction, fix some MIB variable name references

***Revisions to 11-14-0793:***

R0: initial

R1: R2: change table 8-251 references to 8-250, remove the word non-contiguous wherever it appeared

R3: changes to describe interaction between new 80+80 and 160 max nss subfields and basic VHT-MCS fields, modifications to indicate VHT-MCS supported set determination per operational bandwidth

R4: no conceptual changes - fix incorrect value indicated for determinant in the RX section of the determinant=1 case for both 80+80 and 160, and fix the phrase “one less than” to “two less than” in the description of the encoding for the value 2 in the Max NSS for 80+80 Adjustment and Max NSS for 160 Adjustment

R5: correct the value of Max VHT-MCS for n SS that is used to determine the maximum NSS for 80 MHz operation from a value of 0 to a value of 3

R6: Limited NSS reduction to half only. Changed MCS support to same or twice the supported NSS.

R8: added more CIDs

R9: add MIB variable

 Add modifications to subclauses affected by the Extended NSS BW Support indication – e.g. Rx Supported VHT-MCS and NSS Set

 Add VHT capability bit, do not modify existing VHT Cap definitions, but only add new functionality, replacing previously reserved bits

Update baseline text to Draft P802.11REVmc\_D4.0

Remove CID information referring to old WG letter balloting process

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 TGmc Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGmc Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGmc Editor: Editing instructions preceded by “Instruction to Editor” are instructions to the TGmc editor to modify existing material in the TGmc draft. As a result of adopting the changes, the TGmc editor will execute the instructions rather than copy them to the TGmc Draft.***

**CID LIST:**

FOR REFERENCE ONLY

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| --- | --- | --- | --- | --- | --- | --- |
| 5960 | Matthew Fischer | 1306.9 | 9.7.12.1 | Some implementations could have a maximum VHT NSS value that is dependent on the bandwidth of operation. Signaling to support this behavior is desired. Specifically, there is likely to be a difference between maximum NSS support for the 80+80 and 160 MHz bandwidths vs the 20, 40 and 80 MHz bandwidths. | Provide the necessary signaling to allow bandwidth dependent maximum VHT NSS values to be indicated. A presentation will be provided with specific details as to how to accomplish this. Propagate the changes to TVHT. | *Revise - generally agree with commenter, TGmc editor to execute proposed changes from 11-15-0654r14 found under all headings which include CID5960* |

**Discussion:**

Some updates to changes from 11-15-0654-14 which was adopted an incorporated into D4.3

**CID 5960**

***TGmc editor: throughout P802.11REVmc\_D4.3.pdf, change “Extended NSS BW Support” to “VHT Extended NSS BW Support” except where Extended NSS BW Support is already part of the phrase “VHT Extended NSS BW Support” Note that the term appears within at least one diagram, in the VHT Capabilities IE and in some tables and captions of tables. Note that there are some instances where additional nouns appear in the phrase, for example, “Extended NSS BW Support Signaling” and “Dynamic Extended NSS BW Support”.***

**8.4.1.52 Operating Mode field**

***TGmc editor: in Table* 8-73—Setting of the Channel Width subfield and Dynamic Extended NSS BW subfield at a VHT STA transmitting the Operating Mode field *add another note to read as shown:***

NOTE 5 – Twice Max VHT NSS is equal to the smaller of twice the value of Max VHT NSS and 8.

**8.4.2.157.2 VHT Capabilities Info field**

***TGmc editor: in Table 8-244* Setting of the Supported Channel Width Set subfield and Extended NSS BW Support subfield at a STA transmitting the VHT Capabilities Information field *add another note to read as shown:***

NOTE 5 – Twice Max VHT NSS is equal to the smaller of twice the value of Max VHT NSS and 8.

**9.7.12.3 Additional rate selection constraints for VHT PPDUs**

***TGmc editor: in* Table 9-9—Interpretation of the Supported Channel Width Set and Extended NSS BW Support subfield of the VHT Capabilities Information field and the Channel Width field of the**

**Operating Mode field at a receiving STA with a value of true for dot11VHTExtendedNSSBWCapable *add another note to read as shown:***

NOTE 5 – Twice Max VHT NSS is equal to the smaller of twice the value of Max VHT NSS and 8.

**8.4.2.157.3 Supported VHT-MCS and NSS Set field**

***TGmc editor: modify text within 8.4.2.157.3 Supported VHT-MCS and NSS Set field as shown:***

The value of Max VHT NSS for MCS0 through MCS7 is equal to the smaller of:

— the maximum value of *n* for which the Max VHT-MCS for *n* SS has a value that is not equal to 3

— the maximum supported NSS as indicated by the value of the Rx NSS field of the Operation Mode Notification frame if the value of RX NSS Type is 0

The value of Max VHT NSS for MCS8 is equal to the smaller of:

— 0, if there is no value *n* for which the Max VHT-MCS for *n* SS has a value that is equal to 1 or 2

— the maximum value of *n* for which the Max VHT-MCS for *n* SS has a value that is equal to 1 or 2

— the maximum supported NSS as indicated by the value of the Rx NSS field of the Operation Mode Notification frame if the value of RX NSS Type is 0

The value of Max VHT NSS for MCS9 is equal to the smaller of:

— 0, if there is no value *n* for which the Max VHT-MCS for *n* SS has a value that is equal to 2

— the maximum value of *n* for which the Max VHT-MCS for *n* SS has a value that is equal to 2

— the maximum supported NSS as indicated by the value of the Rx NSS field of the Operation Mode Notification frame if the value of RX NSS Type is 0

***TGmc editor: modify the dot11VHTExtendedNSSBWSignaling MIB variable shown:***

**C.3 MIB Detail**

dot11VHTExtendedNSSBWSignaling OBJECT-TYPE

SYNTAX Integer {0..3}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute indicates that the IEEE 802.11 VHT Extended NSS BW Support Signaling option is implemented. The meaning of the value of this parameter corresponds to the encodings found in Tab les Table 8-73, Table 8-244 and Table 9-9."

DEFVAL { false }

::= { dot11StationConfigEntry <ANA> }

dot11VHTExtendedNSSBWSignalingOptionImplemented 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, when true, indicates that the IEEE 802.11 VHT Extended NSS BW Support option is implemented."

DEFVAL { false }

::= { dot11StationConfigEntry <ANA> }

**References:**