IEEE P802.11
Wireless LANs

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| MB and PCP selection fixes |
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Abstract

This document fixes issues with PCP selection and MB operation.

CID6001

**Discussion**: a multi-band capable PCP/AP can redirect STAs to join a BSS on a particular band/channel. This will improve load balancing and network management on a pre-association basis. After association, FST can be used as is.

**8.4.1.9 Status Code field**

*Insert a new status code in Table 8-36 Status Code as follows:* “<ANA>; DENIED\_WITH\_SUGGESTED\_BAND\_AND\_CHANNEL; The association has been denied; however, one or more Multi-band elements are included that can be used by the receiving STA to join the BSS”

**10.33 Multi-band operation**

**10.33.1 General**

*Editor: Change the second paragraph as follows, creating a new third paragraph as a result*

Except for the FST Setup Request and FST Setup Response frames, which shall not include more than one Multi-band element, a STA may include more than one Multi-band element in any one of these frames if it supports more than two bands or channels. If a PCP/AP includes one or more Multi-band elements within a (Re)Association Response frame with Status Code equal to DENIED\_WITH\_SUGGESTED\_BAND\_AND\_CHANNEL or a Probe Response frame, the order in which these elements appear in the frame indicate the order, in terms of frequency band and channel number, that the STA addressed by the frame should attempt join the BSS following the rules applicable to the respective frequency band and channel (see 10.1). For each Multi-band element contained in the frame starting from the first one and proceeding in increasing order, the STA should attempt to join the BSS using the BSSID indicated by the BSSID field, frequency band indicated by the Band ID field and channel number indicated by the Channel Number field provided the Beacon Interval and the Channel Number fields in the Multi-band element are both non-zero.

NOTE – The first Multi-band element in the frame can refer to the current operating frequency band and channel.

A multi-band capable device shall set the Band ID and Operating Class fields within a Multi-band element to specify the frequency band it supports. If the multi-band capable device is or intends to operate in the band indicated within the Multi-band element, it shall set the Channel Number field to indicate the channel of operation within that band. If the multi-band capable device is member of a BSS on both the channel indicated in the Channel Number field within the Multi-band element and also in the channel on which this element is transmitted, then the multi-band capable device shall set the TSF Offset field within a Multi-band element to the difference between the TSF of the BSS the STA is member on the channel indicated in the Channel Number field of this element and the TSF of the BSS corresponding to the BSSID indicated in the Address 3 field of the MPDU in which this element is transmitted. In all other cases, the TSF Offset field shall be set to 0.

**10.1.4.3.4 PCP selection in a PBSS**

*Editor note: change the subclause as indicated below*

The PCP selection procedure is performed by the SME in the following cases:

* At the reception of an MLME-SCAN.confirm that was received in response to an MLME-SCAN.request with the value of the ScanType parameter equal to ACTIVE and BSSType parameter equal to PERSONAL
* As part of a PCP handover (see 10.30.2 PCP Handover).

The decision whether the STA performs in the role of PCP is done by comparing the value of the STA’s PCP Factor (self\_PCP\_factor) and the PCP Factor of the peer STA (peer\_PCP\_factor) that is indicated in the peer STA’s DBand Capabilities element.

The PCP Factor of a STA is constructed by concatenating the value of select fields present in the STA’s DBand Capabilities element defined in 8.4.2.137. The PCP Factor is defined in Figure 10-3b.

NOTE – According to the convention, the least significant bit is the leftmost bit (B0).

For each peer STA reported as part of an MLME-SCAN.confirm or considered as part of a PCP handover, the STA proceeds as follows. If the DBand STA’s value of self\_PCP\_factor is greater than the value of peer\_PCP\_factor or the values are equal and the NIC specific part (3 least significant bytes) of the MAC address of the STA is greater than the NIC specific part of the MAC address of the peer STA contained in the peer STA’s DBand Capabilities element, the DBand STA becomes a candidate PCP. Otherwise, the STA does not become a candidate PCP.

Subclause 10.1.4.4.2 describes the rules the SME of a candidate PCP follows to initialize a PBSS.

*Editor Note*: remove “BSS\_ALREADY\_STARTED\_OR\_JOINED” and its use from the spec

**10.1.4.4.2 Initializing a DBand BSS**

*Editor note: change the last 2 paragraphs of this subclause as indicated below*

The SME should issue an MLME-START.request with BSSType parameter equal to PERSONAL for at least one network in which the STA becomes a candidate PCP as defined in 10.1.4.3.4. If the STA becomes a candidate PCP of more than one network, the SME may issue an MLME-START.request with BSSType parameter equal to PERSONAL for any of the remaining networks. In either case, the MLME-START.request should be issued no later than 4×aMaxBIDuration if it is the result of the reception of an MLME-SCAN.confirm.

The SME should not issue an MLME-START.request with BSSType parameter equal to PERSONAL for networks in which the STA does not become a candidate PCP as defined in 10.1.4.3.4. If the SME issues the MLME-START.request under this circumstance, it shall not be issued if less than 4×aMaxBIDuration has elapsed since the reception of the MLME-SCAN.confirm.