IEEE P802.11
Wireless LANs

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| Operational Rates and MCSs―REVmd SB1 CID 4229 |
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Abstract

CID 4229 and doc. 11-20/0435r6 propose modifying a note in 11.1.4.6 to add the underlined text:

“NOTE 1—A STA is not required to include all mandatory rates or MCSes in its operational rate or MCS set, respectively”.

and to add a definition for operational MCS set, with some sundry supporting changes.

We should not adopt the proposed resolution, because

1. Many (most?) STAs are required to include all mandatory MCSs in (the proposed definition of) their operational MCS set, so the addition is incorrect;
2. Many (most?) STAs are required to include all mandatory rates in their operational rate set, so the note is incorrect.

A separate note in 10.3 is similar but not identical, and 11.1.4.6 proposes extending that note to MCSs also. The applicability of that note is at best limited, since it would not apply for HT or VHT STAs, and its wording needs work anyway. The changes hardly seem worth it, and in any case do not match the comment.

The comment should be rejected.

References to page and line numbers are to D3.0.

Change history:

r0 (2020-07-14): Initial draft.

1. **Many (most?) STAs are required to include all mandatory MCSs in (the proposed definition of) their operational MCS set, so the addition is incorrect**

An “operational rate set” is “the set of data rates that a station (STA) is capable of receiving” (Clause 3), so an operational MCS set would be “the set of MCSs that a station (STA) is capable of receiving”, per 11/20-0435r6.

Then the spec is clear in the case of VHT:

“A VHT STA shall support the following features:

— …

— Single spatial stream VHT-MCSs 0 to 7 (transmit and receive) in all supported channel widths” (3139.38)

and since these are the only mandatory VHT-MCSs (21.5), the operational MCS set of a VHT STA would be required to include all mandatory VHT-MCSs.

Cf. also HT:

“An HT STA shall support all equal modulation (EQM) rates for one spatial stream (MCSs 0 to 7) using a 20 MHz channel width. An HT AP that is not a VHT AP shall support all EQM rates for two spatial streams (MCSs 8 to 15) using a 20 MHz channel width.” (3004.23)

and since these are the only mandatory HT-MCSs, an HT STA, whether AP or non-AP, shall support all mandatory HT-MCSs. Under the proposed definition, assuming that “support” includes transmit and receive, the operational MCS set of an HT STA, whether AP or non-AP, would be required to include all mandatory HT-MCSs.

1. **Many (most?) STAs are required to include all mandatory rates in their operational rate sets, so the note is incorrect**

The comment says there should be an equivalent statement (to the cited note, without additions) for MCSs. But the note itself is not correct for many (most?) STAs.

For the case of HT,

“an HT STA shall be capable of transmitting and receiving frames that are compliant with the mandatory PHY specifications defined as follows:

— In Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) when the HT STA is operating in a 20 MHz channel width in the 5 GHz band

— In Clause 16 (High rate direct sequence spread spectrum (HR/DSSS) PHY specification) and Clause 18 (Extended Rate PHY (ERP) specification) when the HT STA is operating in a 20 MHz channel width in the 2.4 GHz band” (2982.14)

and the VHT case follows:

“A STA for which dot11VHTOptionImplemented is true shall set dot11HighThroughputOptionImplemented to true.” (2502.5)

**C. The comment should be rejected**

11/20-0435r6 also refers to 10.3:

“NOTE—A STA’s operational rate set does not necessarily contain all the mandatory rates. However a STA has to be capable of receiving using a mandatory rate (as required by the rules in 10.6 (Multirate support)) even if it is not present in this set.” (1725.31)

This is better than the note in 11.1.4.6, since the “necessarily” might account for differences among STA types. I.e., it might be that a STA’s operational rate set and (proposed) operational MCS set do not contain all the mandatory rates and MCSs, if the STA is not an HT or VHT STA. Are there STA types for which this is true?

Even if there are such STA types, the second sentence is confusing, since it seems to imply that all STAs have to be capable of receiving at a mandatory rate even if it is not present in the STA’s operational rate set, “as required by the rules in 10.6”. But since a STA’s “operational rate set” is “the set of data rates that a station (STA) is capable of receiving” (Clause 3), this would mean that a STA has to be capable of receiving at a mandatory rate, even if that rate is not part of the set of data rates that the STA is capable of receiving, which makes no sense. Perhaps “as” should be “if” here. But that should be a topic for another comment, if anyone wants to submit one.

In the meantime, we should resolve the comment that was submitted.

Proposed resolution:

“Rejected. Many (most?) STAs are required to include all mandatory MCSs in (the proposed definition of) their operational MCS set. See 11/20-1081r0.”

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