IEEE P802.11
Wireless LANs

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| Corrections to DMG control frame rate selection |
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Abstract

This submission extends the DMG rates applicable to standalone Ack and BlockAck frames and certain aggregated A-MPDUs. Specifically, lower MCSs in the MCS1-4 range can be used to transmit certain control response frames and certain aggregation of such frames as long as the frame transmission time is not increased. It resolves CID 3264.

**Revision History**

R0: Initial revision

R1: Reverted “may use any MCS from ...” to “shall use any MCS from...” in both paragraphs

**Comment**

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| 3264 | "A STA transmitting an Ack frame or a BlockAck frame in response to a frame sent using the DMG SC modulation class or DMG OFDM modulation class shall use an MCS from the mandatory MCS set of the DMG SC modulation class and shall use the highest MCS index for which the Data Rate is the same as or lower than that of the frame that elicited the response." This statement requires the ACK or Block ACK frame to an MCS 10 data frame to be transmitted using MCS 4, but any MCS 1-4 is Ok for ACK and any MCS 2-4 is Ok for Block Ack (frame duration won't change), and lower MCS's bring more robustness. |

**Discussion**

DMG rate selection rules for control response frames transmitted in response to SC or OFDM PPDUs forces an ACK or BlockAck frame to be transmitted using the highest MCS in the MCS1-4 range that is not faster than the MCS of the PPDU that elicited the response.

We observe that sending short control response frames such as standalone ACK or BlockAck in certain lower MCSs does not change the control response frame duration yet brings more robustness to these key frames. For example, a Compressed BlockAck frame (Section 8.3.1.9.3) with 32 bytes (or its extended version with 33 bytes) has the same airtime duration of 3.0909 µs for MCS 2-4; or an Ack frame with 14 bytes has the same airtime duration of 3.0909 µs for MCS 1-4 – so there is no reason to force these frames to be transmitted using MCS 4 in response to an MCS 5 PPDU for example.

The corresponding text for low-power SC is flawed since it allows *any* low-power SC MCS to be used for a control response frame as long as it does not exceed the MCS of the PPDU that elicited the control respose frame. This brings variabilitty into NAV calculation and shoud be avoided, similar to SC and OFDM cases.

*[Note for editor: Modify the following paragraph].*

**9.7.7.2 Rate selection rules for Control frames transmitted by DMG STAs**

...

A STA transmitting an Ack or a BlockAck frame that is a response to a frame sent using the DMG low-power SC modulation class shall use an MCS from the DMG low-power SC Supported MCS set of the STA that transmitted the frame that elicited the response as long as (a) the selected MCS has a Data Rate that does not exceed the Data Rate of the frame that elicited the response, and (b) no other MCS satisfying condition (a) results in a shorter frame transmission time.

...

A STA transmitting an Ack frame or a BlockAck frame in response to a frame sent using the DMG SC modulation class or DMG OFDM modulation class shall use an MCS from the mandatory MCS set of the DMG SC modulation class as long as (a) the selected MCS has a Data Rate that does not exceed the Data Rate of the frame that elicited the response, and (b) no other MCS satisfying condition (a) results in a shorter frame transmission time.