IEEE P802.11  
Wireless LANs

|  |  |  |  |
| --- | --- | --- | --- |
| EIFS comment | | | |
| **Date:** January 20, 2016 | | | |
| Author: | | | |
| Name | Affiliation | Address | Email |
| Menzo Wentink | Qualcomm | Straatweg 66, Breukelen, The Netherlands | mwentink@qti.qualcomm.com |

**Abstract**

This document contains a proposed resolution for an EIFS-related comment carried over from SB1.

|  |  |  |  |
| --- | --- | --- | --- |
| **SB1 CID** | Identifiers | Comment | Proposed Change |
| **5966** | draft 5.0:  10.3.7  P1298 L1 | EIFS can be avoided at devices that do not implement dynamic EIFS (yet) by requiring that a TXOP is always terminated with a transmission of an ACK at the lowest rate within the PHY. (Dynamic EIFS is defined in 10.3.7, P1298 L9 in 802.11REVmc draft 5.0.) | Require that the TXOP holder terminates a TXOP with an ACK at the lowest rate within the PHY (i.e. at 6 Mbps for 11ac). |

**Discussion**

Spurious EIFSs as addressed in the comment can be caused by any final control response frame transmitted at a rate higher than 6 Mbps (typically 12 or 24 Mbps), because the preamble of such PPDUs travels far beyond the MPDU, which causes an EIFS to occur in a potentially very large region. The response rate selection can not be controlled however, so an option is that the TXOP holder sends a short frame at 6 Mbps as the terminating frame in a TXOP. This final terminating transmission truncates an EIFS in a large region around the TXOP holder, strongly reducing the area where a a spurious EIFS may occur.

Based on offline discussion, it appears that there is a preference to use a CF-End as the terminating frame, because its definition already exists. A CF-End is longer than an ACK but probably still not causing much overhead. The proposed resolution therefore proposes to add an explanation about terminating any TXOP with a CF-End at 6 Mbps, and makes it a should requirement, while also allowing the use of a CTS-to-self.

Note that an alternative solution would be to deprecate EIFS altogether.

**Proposed resolution**

Revised. After 10.22.2.9 (Truncation of TXOP) add a new subclause 10.22.2.9a as follows:

**10.22.2.9a Termination of TXOP**

A TXOP holder that transmits a PPDU using one of the modulation classes in Table 10-a1 (Modulation classes eligible for TXOP termination) should transmit a short control frame as the final transmission in a TXOP, under the conditions specified in Table 10-a2 (Rate and modulation class of a final transmission in a TXOP).

**Table 10-a1--Modulation classes eligible for TXOP termination**

|  |
| --- |
| **Modulation classes eligible for TXOP termination (see Table 10-6 (Modulation classes))** |
| DSSS |
| HR/DSSS |
| ERP-OFDM |
| OFDM |
| HT |
| VHT |

**Table 10-a2--Rate and modulation class of a final transmission in a TXOP**

|  |  |
| --- | --- |
| **Modulation class and data rate of immediately preceding frame in TXOP** | **Rate and modulation class of final transmission** |
| DSSS or HR/DSSS with long preamble, data rate > 1 Mbps | 1 Mbps DSSS |
| HR/DSSS with short preamble, data rate > 2 Mbps | 2 Mbps HR/DSSS short preamble |
| Other eligible modulation classes, data rate > 6 Mbps | 6 Mbps OFDM |

The final transmission can be a CF-End, or a CTS-to-self when no NAV needs to be truncated.

NOTE: The final transmission at the lowest data rate within the modulation class is needed because a final transmission at a higher rate can cause spurious EIFSs to occur, because the PHY header of such frames travels farther then the MPDU.