IEEE P802.11
Wireless LANs

|  |
| --- |
| [3.1.4 MIMO Channel Access] |
| Date: 2017-2-25 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Cheng Chen | Intel |  |  | cheng.chen@intel.com |
| Carlos Cordeiro | Intel |  |  |  |

Abstract

[This document proposes draft changes to include MIMO channel access rules for EDMG STAs.]

10.36.11 EDMG channel access

10.36.11.4 MIMO Channel Access

Insert the following subsection at the beginning of the section.

**10.36.11.4.1 MIMO Channel Access Rules**

An EDMG STA that has either the MU-MIMO Supported set to 1 or the SU-MIMO Supported set to 1 in the Beamforming Capability field of its EDMG Capabilities element shall maintain physical and virtual CS and backoff procedure as specified in 10.22.2 (HCF contention based channel access (EDCA)) in order to be able to transmit and receive a single stream (SISO) PPDU used for the establishement for a TXOP during which a MIMO transmission is to take place.

When an EDMG STA that has either the MU-MIMO Supported set to 1 or the SU-MIMO Supported set to 1 in the Beamforming Capability field of its EDMG Capabilities attempts to obtain an TXOP for MIMO transmission, CCA shall be maintained such that at least all the MIMO TX antennas intended to be used in the TXOP, which are determined by the MIMO beamforming protocols defined in 10.38.6.5 (SU-MIMO beamforming) or in 10.38.6.6 (MU-MIMO beamforming), are observed. The STATE parameter of PHY-CCA.indication can be one of two values: BUSY or IDLE. The parameter value is BUSY if the assessment of the channel by the PHY determines that the channel on at least one of the MIMO TX antennas is not idle. The parameter value is IDLE if the assessment of the channel on all of the MIMO TX antennas by the PHY determines that the channel is idle.

In the following, “MIMO channel was idle for an internval of PIFS” means that the STATE parameter of the most recent PHY-CCA.indication primitive that sensed at least all the MIMO TX antennas was IDLE for a period of PIFS that ends at the start of the the transmission. “MIMO channel was busy” means that the STATE parameter of the most recent PHY-CCA.indication primitive that sensed at least all the MIMO TX antennas was BUSY.

A TXOP is obtained based on the physical CS, the virtual CS, and the backoff procedure that enables SISO transmission (see 10.3 DCF and 10.22.2 HCF contention based channel access (EDCA)). When the channel is clear for SISO transmission (physical and virtual CS are clear) and the backoff timer for SISO transmission reaches 0, a STA is permitted to obtain a TXOP. If the STA has at least one MSDU pending for transmission for the AC of the permitted TXOP, the STA shall perform exactly one of the following actions:

1. Transmit a MIMO PPDU if MIMO channel was idle for an interval of PIFS immediately preceding the start of the TXOP.
2. Transmit a SISO PPDU if MIMO channel was busy during an interval of PIFS immediately preceding the start of the TXOP.
3. Restart the channel access attempt by invoking the backoff procedure as specififed in 10.22.2 (HCF contention based channel access (EDCA)) as though the medium is busy as indicated by either physical or virtual CS and the backoff timer has a value of 0.

Create a new subsection for the rest of the content in 10.36.11.4

**10.36.11.4.2 MIMO Channel Access Procedure**