IEEE P802.11
Wireless LANs

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| 30.2.3 Support for non-EDMG and EDMG Formats |
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Abstract

This document proposes specification text for subclause 30.2.3 (Support for non-EDMG and EDMG formats), [1].

*Editor: add subclause 30.2.3 PHYCONFIG\_VECTOR parameters into the D0.5 spec draft*

**30.2.3 PHYCONFIG\_VECTOR parameters**

The PHYCONFIG\_VECTOR carried in a PHY-CONFIG.request primitive for an EDMG PHY contains a CHANNEL\_WIDTH parameter, which identifies the operating channel width and takes one of the values 2.16 GHz, 4.32 GHz, 6.48 GHz, 8.64 GHz, 2.16+2.16 GHz, and 4.32+4.32 GHz. The PHY shall set dot11CurrentChannelWidth to the value of this parameter.

The PHYCONFIG\_VECTOR carried in a PHY-CONFIG.request primitive for an EDMG PHY contains a CENTER\_FREQUENCY\_INDEX parameter, which identifies the center of 8.64 GHz channel allocated for the BSS operation. The PHY shall set dot11ChannelCenterFrequencyIndex to the value of this parameter defined in the range from 4 to 8 (see Table 32).

The PHYCONFIG\_VECTOR carried in a PHY-CONFIG.request primitive for an EDMG PHY contains a CENTER\_FREQUENCY\_INDEX\_0 parameter, which identifies the center frequency of the 2.16 GHz, 4.32 GHz, 6.48 GHz, and 8.64 GHz channel. For 2.16+2.16 GHz channel configuration, it identifies the center frequency of the primary channel. For 4.32+4.32 GHz channel configuration, it identifies the center frequency of the 4.32 GHz channel containing the primary 2.16 GHz channel. The PHY shall set dot11CurrentChannelCenterFrequencyIndex0 to the value of this parameter defined in the range from 1 to 11 (see Table 32).

The PHYCONFIG\_VECTOR carried in a PHY-CONFIG.request primitive for an EDMG PHY contains a CENTER\_FREQUENCY\_INDEX\_1 parameter, which for 2.16+2.16 GHz channel configuration identifies the center frequency of the secondary channel. For 4.32+4.32 GHz channel configuration, it identifies the center frequency of the 4.32 GHz channel which does not contain the primary 2.16 GHz channel. The PHY shall set dot11CurrentChannelCenterFrequencyIndex1 to the value of this parameter defined in the range from 1 to 11 (see Table 32).

The PHYCONFIG\_VECTOR carried in a PHY-CONFIG.request primitive for an EDMG PHY contains an OPERATING\_CHANNEL\_INDEX parameter, which identifies the operating or primary 2.16 GHz channel. The PHY shall set dot11CurrentPrimaryChannel to the value of this parameter defined in the range from 1 to 11 (see Table 32).

The valid channel configurations for an EDMG STA and configuration rules are defined in 30.3.4.

*Editor: add subclause 30.2.4 Support for non-EDMG and EDMG formats into the D0.5 spec draft*

**30.2.4 Support for non-EDMG and EDMG formats**

**30.2.4.1 General**

An EDMG STA logically contains Clause 20 and Clause 30 PHYs. The MAC interfaces to the PHY via the Clause 30 PHY service interface, which in turn interacts with Clause 20 PHY service interface. The EDMG PHY TXVECTOR and RXVECTOR defined in 30.2.2 structurally include all fields of the DMG TXVECTOR and RXVECTOR accordingly defined in 20.2.2. The EDMG PHY TXSTATUS vector is identical to the TXSTATUS vector defined for DMG PHY in 20.2.3. The EDMG PHYCONFIG\_VECTOR defined in 30.2.3 structurally includes all fields of the DMG PHYCONFIG\_VECTOR defined in (TBD).

*Editor: currently 11ad spec does not define the PHYCONFIG\_VECTOR, need to define it in 11md*

**30.2.4.2 EDMG STA PHY entity configuration for transmission**

Figure 1 shows an EDMG STA PHY SAP interactions on transmit for different PPDU formats.



Figure 1: EDMG STA PHY interaction on transmit for various PPDU formats

The selection of the PHY type is based on the FORMAT parameter included into the TXVECTOR and transferred from MAC to PHY entity using PHY-TXSTART.request(TXVECTOR) primitive.

If FORMAT parameter is set to EDMG, then Clause 30 PHY entity is used for transmission. The transmission mode is selected based on the TXVECTOR EDMG\_MODULATION parameter and it can be set to EDMG\_C\_MODE for the EDMG Control mode (Clause 30.4), EDMG\_SC\_MODE for the EDMG SC mode (Clause 30.5), and EDMG\_OFDM for EDMG OFDM mode (Clause 30.6).

If FORMAT parameter is set to NON\_EDMG and TXVECTOR NON\_EDMG\_MODULATION parameter is set to either NON\_EDMG\_DUP\_C\_MODE or NON\_EDMG\_DUP\_SC\_MODE, then Clause 30 PHY entity is used for transmission. If NON\_EDMG\_MODULATION parameter is set to the NON\_EDMG\_DUP\_C\_MODE, then the non-EDMG Control mode transmission defined in 30.4.6.2 is selected. If NON\_EDMG\_MODULATION parameter is set to the NON\_EDMG\_DUP\_SC\_MODE, then the non-EDMG SC mode defined in 30.5.9.3 is selected.

If FORMAT parameter is set to NON\_EDMG and NON\_EDMG\_MODULATION is set to either C\_MODE or SC\_MODE, then Clause 20 PHY entity is used for transmission. The TXVECTOR content is filtered out while transferring to the Clause 20 PHY entity to keep the DMG fields only to define the TXVECTOR in accordance with DMG PHY SAP interface (see 20.2.2). If NON\_EDMG\_MODULATION is set to the C\_MODE, then the DMG Control mode defined in 20.4 is selected. If NON\_EDMG\_MODULATION is set to the SC\_MODE, then the DMG SC mode defined in 20.6 is selected.

**30.2.4.3 EDMG STA PHY entity configuration for reception**

Figure 2 shows an EDMG STA PHY SAP interactions on receive for different PPDU formats.



Figure 2: EDMG STA PHY interaction on receive for various PPDU formats

The selection of the PHY type at the reception is based on the FORMAT detection. For Control mode PPDU, if the reserved bits 22 and 23 of L-Header are both set to 1, then the FORMAT parameter is set to the EDMG. Otherwise the FORMAT parameter is set to the NON\_EDMG.

For SC and OFDM mode PPDU, if the reserved bit 46 of L-Header is set to 1, then the FORMAT parameter is set to the EDMG. Otherwise the FORMAT parameter is set to the NON\_EDMG.

If FORMAT parameter is EDMG, then Clause 30 PHY entity is used for reception. If FORMAT is EDMG and PHY entity detects the Gb Golay sequence in the L-STF field, then the EDMG\_MODULATION parameter is set to the EDMG\_C\_MODE. If FORMAT is EDMG and PHY entity detects the Ga Golay sequence in the L-STF field and the IsSC bit of L-Header is set to 1 (see Table 19), then the EDMG\_MODULATION parameter is set to the EDMG\_SC\_MODE. If FORMAT is EDMG and PHY entity detects the Ga Golay sequence in the L-STF field and the IsSC bit of L-Header is set to 0 (see Table 19), then the EDMG\_MODULATION parameter is set to the EDMG\_OFDM\_MODE.

If FORMAT parameter is NON\_EDMG, then Clause 20 PHY entity is used for reception. If FORMAT is NON\_EDMG and PHY entity detects the Gb Golay sequence in the L-STF field, then the NON\_EDMG\_MODULATION parameter is set to the C\_MODE. If FORMAT is NON\_EDMG and PHY entity detects the Ga Golay sequence in the L-STF field, then the NON\_EDMG\_MODULATION parameter is set to the SC\_MODE. The RXVECTOR content is augmented with the EDMG fields to define the RXVECTOR in accordance with EDMG PHY SAP interface (see 30.2.2). The augmented RXVECTOR is passed to the EDMG PHY SAP interface.

Note, that the PHY entity cannot distinguish between the NON\_EDMG\_DUP\_C\_MODE and C\_MODE and between the NON\_EDMG\_DUP\_SC\_MODE and SC\_MODE. The EDMG STA performs the non-EDMG PPDU detection and reception in the primary 2.16 GHz channel only.

**30.2.4.4 EDMG STA PHY entity channel bandwidth configuration**

Figure 3 shows an EDMG STA PHY SAP operating channel bandwidth configuration using PHYCONFIG\_VECTOR parameters.



Figure 3: EDMG STA PHY interaction on channel bandwidth configuration for Clause 30 and Clause 20 PHYs

The EDMG STA PHY entity configuration is performed using PHYCONFIG\_VECTOR parameters defined in 30.2.3. The configuration of Clause 30 PHY entity shall follow the rules defined in 30.3.4 for dot11CurrentChannelWidth, dot11ChannelCenterFrequencyIndex, dot11CurrentChannelCenterFrequencyIndex0, dot11CurrentChannelCenterFrequencyIndex1, and dot11CurrentPrimaryChannel PLME MIB fields setup.

The configuration of Clause 20 PHY entity by EDMG STA is performed by setting the OPERATING\_CHANNEL\_INDEX parameter, which identifies the operating or primary 2.16 GHz channel. The PHY shall set dot11CurrentPrimaryChannel to the value of this parameter defined in the range from 1 to 11 (see Table 32). The configuration of OPERATING\_CHANNEL\_INDEX parameter (dot11CurrentPrimaryChannel) shall follow the rules defined in 30.3.4. All other parameters of the EDMG PHYCONFIG\_VECTOR are filtered out while transferring to the Clause 20 PHY entity to keep the DMG fields only to define the PHYCONFIG\_VECTOR in accordance with DMG PHY SAP interface (see TBD).

**30.2.4.5 EDMG STA PHY CCA**

The EDMG STA shall follow the CCA requirements defined in 30.3.8 for both Clause 30 and Clause 20 PHY entities.

**SP:**

Do you agree to include the proposed text for “30.2.3 Support for non-EDMG and EDMG Formats” proposed in (11-17-1599-00-00ay 30 2 3 Support for non-EDMG and EDMG Formats) into the D0.8?

**References:**

1. Draft P802.11ay\_D0.8