Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**OFDMA PHY Configuration and ASN.1 code**
Date Submitted	**2006-03-06**
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Re:	
Abstract	This contribution proposed the text and ASN.1 code for OFDMA PHY.
Purpose	Adoption
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1

1. Introduction

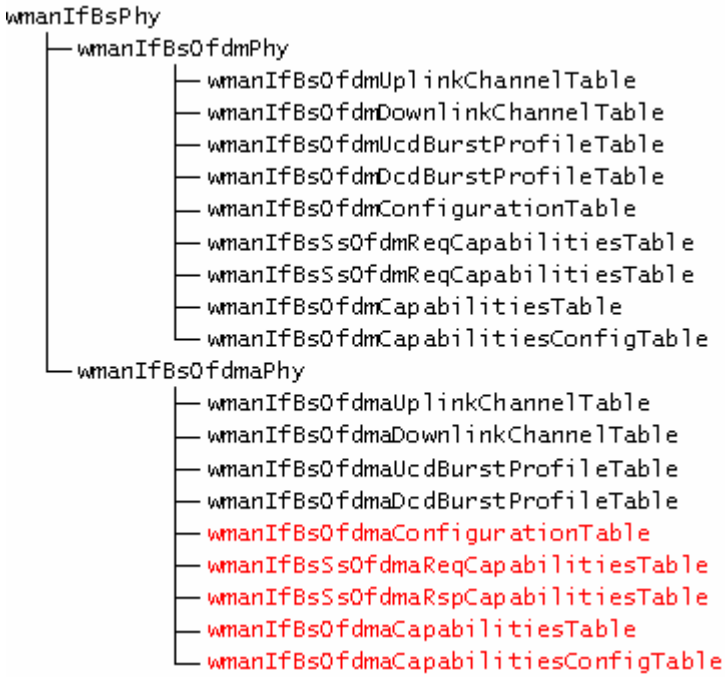
This contribution proposes the text for Section 13 and Annex E of IEEE P802.16i WG draft.

2. OFDMA PHY Configuration

This section proposes new table for OFDMA PHY.

13.1.1.5 wmanIfBsPhy

[Replace the Figure 7 with the following:]



[Add the following subclauses:]

13.1.1.5.2.5 wmanIfBsOfdmaConfigurationTable

wmanIfBsOfdmaConfigurationTable contains BS configuration objects, specific to OFDMA PHY.

13.1.1.5.2.6 wmanIfBsSsOfdmaReqCapabilitiesTable

wmanIfBsSsOfdmaReqCapabilitiesTable contains the basic capability information, specific to OFDMA Phy, of SSs or MSs that have been reported by SSs to BS using RNG-REQ, SBC-REQ and REG-REQ messages. Entries in this table should be created when an SS registers with a BS.

13.1.1.5.2.7 wmanIfBsSsOfdmaRspCapabilitiesTable

wmanIfBsSsOfdmaRspCapabilitiesTable contains the basic capability information, specific to OFDMA Phy, of SSs or MSs that have been negotiated and agreed between BS and SS via RNG-

REQ/RSP, SBC-REQ/RSP and REG-REQ/RSP messages. This table augments the wmanIfBsRegisteredSsTable.

13.1.1.5.2.8 wmanIfBsOfdmaCapabilitiesTable

wmanIfBsOfdmaCapabilitiesTable contains the basic capabilities, specific to OFDMA Phy, of the BS as implemented in BS hardware and software.

13.1.1.5.2.9 wmanIfBsOfdmaCapabilitiesConfigTable

wmanIfBsOfdmaCapabilitiesConfigTable contains the configuration for basic capabilities of BS, specific to OFDMA Phy. The table is intended to be used to restrict the Capabilities implemented by BS.

3. ASN.1 Code for OFDMA PHY

The following lists the ASN.1 code for OFDMA PHY enhancement.

[Add the following ASN.1 code to Annex E:]

```
WmanIfOfdmFftSizes ::= TEXTUAL-CONVENTION
        STATUS      current
        DESCRIPTION
            "This field indicates the FFT sizes supported by the SS/MS.
             For each FFT size, a bit value of 0 indicates
             'not supported' while 1 indicates 'supported'."
        REFERENCE
            "Subclause 11.8.3.6.1 in IEEE 802.16-2004"
        SYNTAX      BITS {fft256(0),
                          fft2048(1),
                          fft128(2),
                          fft512(3),
                          fft1024(4)}


WmanIfOfdmaMsDeModType ::= TEXTUAL-CONVENTION
        STATUS      current
        DESCRIPTION
            "This field indicates the different demodulator options
             supported by a WirelessMAN-OFDMA PHY SS for downlink.
             A bit value of 0 indicates 'not supported' while 1
             indicates 'supported'."
        REFERENCE
            "Subclause 11.8.3.7.2 in IEEE 802.16e"
        SYNTAX      BITS {qam64(0),
                          btc(1),
                          ctc(2),
                          stc(3),
                          aasDiversityMapScan(4),
                          harqChase(5),
                          harqCtcIr(6),
                          reserved(7),
                          harqCcIr(8),
                          ldpc(9)}

WmanIfOfdmaMsModType ::= TEXTUAL-CONVENTION
        STATUS      current
        DESCRIPTION
            "This field indicates the different modulator options
             supported by a WirelessMAN-OFDMA PHY SS for uplink. A bit
             value of 0 indicates 'not supported' while 1 indicates
             'supported'."
        REFERENCE
            "Subclause 11.8.3.7.3 in IEEE 802.16e"
```

```
                SYNTAX      BITS {qam64(0),
                                  btc(1),
                                  ctc(2),
                                  stc(3),
                                  harqChase(4),
                                  ctcIr(5),
                                  ccIr(6),
                                  ldpc(7)}

        WmanIfOfdmaPermutation ::= TEXTUAL-CONVENTION
                STATUS      current
                DESCRIPTION
                    "This field indicates the OFDMA SS Permutation support
                     A bit value of 0 indicates 'not supported' while 1
                     indicates 'supported'."
                REFERENCE
                    "Subclause 11.8.3.7.5 in IEEE 802.16e"
                SYNTAX      BITS {optionalPuscSupport(0),
                                  optionalFuscSupport(1),
                                  amcOneBySixSupport(2),
                                  amcTwoByThreeSupport(3),
                                  amcThreeByTwoSupport(4),
                                  amcSupportWithHarqMap(5),
                                  tusc1Support(6),
                                  tusc2(7)}

        WmanIfOfdmaMobility ::= TEXTUAL-CONVENTION
                STATUS      current
                DESCRIPTION
                    "This field indicates whether or not the MS supports
                     mobility hand-over, Sleepmode, and Idle-mode. A bit
                     value of 0 indicates 'not supported' while 1 indicates
                     it is supported."
                REFERENCE
                    "Subclause 11.8.3.7.5 in IEEE 802.16e"
                SYNTAX      BITS {handoverSupport(0),
                                  sleepModeSupport(1),
                                  idleModeSupport(2)}

        wmanIfBsMsOfdmaReqCapabilitiesTable OBJECT-TYPE
                SYNTAX      SEQUENCE OF WmanIfBsMsOfdmaReqCapabilitiesEntry
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table contains the basic capability information,
                     specific to OFDMA Phy, of MSs that have been reported by
                     MSs to BS using RNG-REQ, SBC-REQ and REG-REQ messages.
                     Entries in this table should be created when an MS
                     registers with a BS."
                ::= { wmanIfBsOfdmaPhy 5 }

        wmanIfBsMsOfdmaReqCapabilitiesEntry OBJECT-TYPE
                SYNTAX      WmanIfBsMsOfdmaReqCapabilitiesEntry
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table provides one row for each MS that has been
                     registered in the BS. This table augments the table
                     wmanIfBsRegisteredSsTable."
                AUGMENTS { wmanIfBsRegisteredSsEntry }
                ::= { wmanIfBsMsOfdmaReqCapabilitiesTable 1 }

        WmanIfBsMsOfdmaReqCapabilitiesEntry ::= SEQUENCE {
                wmanIfBsMsOfdmaReqCapFftSizes           WmanIfOfdmFftSizes,
                wmanIfBsMsOfdmaReqCapDemodulator        WmanIfOfdmaMsDeModType,
                wmanIfBsMsOfdmaReqCapModulator          WmanIfOfdmaMsModType,
                wmanIfBsMsOfdmaReqCapPermutation        WmanIfOfdmaPermutation,
                wmanIfBsMsOfdmaReqCapMobilityFeature    WmanIfOfdmaMobility}

        wmanIfBsMsOfdmaReqCapFftSizes OBJECT-TYPE
                SYNTAX      WmanIfOfdmFftSizes
                MAX-ACCESS  read-only
```

```
                STATUS      current
                DESCRIPTION
                    "This field indicates the FFT sizes supported by MS."
                ::= { wmanIfBsMsOfdmaReqCapabilitiesEntry 1 }

        wmanIfBsMsOfdmaReqCapDemodulator OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMsDeModType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the different demodulator options
                     supported by MS for downlink."
                ::= { wmanIfBsMsOfdmaReqCapabilitiesEntry 2 }

        wmanIfBsMsOfdmaReqCapModulator OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMsModType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the different modulator options
                     supported by MS for uplink."
                ::= { wmanIfBsMsOfdmaReqCapabilitiesEntry 3 }

        wmanIfBsMsOfdmaReqCapPermutation OBJECT-TYPE
                SYNTAX      WmanIfOfdmaPermutation
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the OFDMA MS Permutation support"
                ::= { wmanIfBsMsOfdmaReqCapabilitiesEntry 4 }

        wmanIfBsMsOfdmaReqCapMobilityFeature OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMobility
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "The field indicates whether or not the MS supports
                     mobility hand-over, Sleepmode, and Idle-mode."
                ::= { wmanIfBsMsOfdmaReqCapabilitiesEntry 5 }

        wmanIfBsMsOfdmaRspCapabilitiesTable OBJECT-TYPE
                SYNTAX      SEQUENCE OF WmanIfBsMsOfdmaRspCapabilitiesEntry
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table contains the basic capability information,
                     specific to OFDMA Phy, of MSs that have been reported by
                     MSs to BS using RNG-REQ, SBC-REQ and REG-REQ messages.
                     Entries in this table should be created when an MS
                     registers with a BS."
                ::= { wmanIfBsOfdmaPhy 6 }

        wmanIfBsMsOfdmaRspCapabilitiesEntry OBJECT-TYPE
                SYNTAX      WmanIfBsMsOfdmaRspCapabilitiesEntry
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table provides one row for each MS that has been
                     registered in the BS. This table augments the table
                     wmanIfBsRegisteredSsTable."
                AUGMENTS { wmanIfBsRegisteredSsEntry }
                ::= { wmanIfBsMsOfdmaRspCapabilitiesTable 1 }

        WmanIfBsMsOfdmaRspCapabilitiesEntry ::= SEQUENCE {
                wmanIfBsMsOfdmaRspCapFftSizes           WmanIfOfdmFftSizes,
                wmanIfBsMsOfdmaRspCapDemodulator        WmanIfOfdmaMsDeModType,
                wmanIfBsMsOfdmaRspCapModulator          WmanIfOfdmaMsModType,
                wmanIfBsMsOfdmaRspCapPermutation        WmanIfOfdmaPermutation,
                wmanIfBsMsOfdmaRspCapMobilityFeature    WmanIfOfdmaMobility}

        wmanIfBsMsOfdmaRspCapFftSizes OBJECT-TYPE
                SYNTAX      WmanIfOfdmFftSizes
```

```
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the FFT sizes negotiated with the
                     MS."
                ::= { wmanIfBsMsOfdmaRspCapabilitiesEntry 1 }

        wmanIfBsMsOfdmaRspCapDemodulator OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMsDeModType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the different demodulator options
                     negotiated for MS for downlink."
                ::= { wmanIfBsMsOfdmaRspCapabilitiesEntry 2 }

        wmanIfBsMsOfdmaRspCapModulator OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMsModType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the different modulator options
                     negotiated for MS for uplink."
                ::= { wmanIfBsMsOfdmaRspCapabilitiesEntry 3 }

        wmanIfBsMsOfdmaRspCapPermutation OBJECT-TYPE
                SYNTAX      WmanIfOfdmaPermutation
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the OFDMA MS Permutation support
                     negotiated for MS."
                ::= { wmanIfBsMsOfdmaRspCapabilitiesEntry 4 }

        wmanIfBsMsOfdmaRspCapMobilityFeature OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMobility
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "The field indicates the mobility hand-over, Sleepmode,
                     and Idle-mode negotiated for MS."
                ::= { wmanIfBsMsOfdmaRspCapabilitiesEntry 5 }

        wmanIfBsOfdmaCapabilitiesTable OBJECT-TYPE
                SYNTAX      SEQUENCE OF WmanIfBsOfdmaCapabilitiesEntry
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table contains the basic capabilities, specific to
                     OFDMA Phy, of the BS as implemented in BS hardware and
                     software. These capabilities along with the configuration
                     for them (wmanIfBsOfdmaCapabilitiesConfigTable) are used
                     for negotiation of basic capabilities with SS using
                     RNG-RSP, SBC-RSP and REG-RSP messages. The negotiated
                     capabilities are obtained by interSubclause of MS raw
                     reported capabilities, BS raw capabilities and BS
                     configured capabilities. The objects in the table have
                     read-only access. The table is maintained by BS."
                ::= { wmanIfBsOfdmaPhy 7 }

        wmanIfBsOfdmaCapabilitiesEntry OBJECT-TYPE
                SYNTAX      WmanIfBsOfdmaCapabilitiesEntry
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table provides one row for each BS sector and is
                     indexed by ifIndex."
                INDEX { ifIndex }
                ::= { wmanIfBsOfdmaCapabilitiesTable 1 }

        WmanIfBsOfdmaCapabilitiesEntry ::= SEQUENCE {
                wmanIfBsOfdmaCapFftSizes                WmanIfOfdmFftSizes,
```

```
        wmanIfBsOfdmaCapDemodulator             WmanIfOfdmaMsDeModType,
        wmanIfBsOfdmaCapModulator               WmanIfOfdmaMsModType,
        wmanIfBsOfdmaCapPermutation             WmanIfOfdmaPermutation,
        wmanIfBsOfdmaCapMobilityFeature         WmanIfOfdmaMobility}

wmanIfBsOfdmaCapFftSizes OBJECT-TYPE
        SYNTAX      WmanIfOfdmFftSizes
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This field indicates the FFT sizes supported by BS."
        ::= { wmanIfBsOfdmaCapabilitiesEntry 1 }

wmanIfBsOfdmaCapDemodulator OBJECT-TYPE
        SYNTAX      WmanIfOfdmaMsDeModType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This field indicates the different demodulator options
             supported by BS."
        ::= { wmanIfBsOfdmaCapabilitiesEntry 2 }

wmanIfBsOfdmaCapModulator OBJECT-TYPE
        SYNTAX      WmanIfOfdmaMsModType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This field indicates the different modulator options
             supported by BS."
        ::= { wmanIfBsOfdmaCapabilitiesEntry 3 }

wmanIfBsOfdmaCapPermutation OBJECT-TYPE
        SYNTAX      WmanIfOfdmaPermutation
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This field indicates the OFDMA MS Permutation support
             supported by BS."
        ::= { wmanIfBsOfdmaCapabilitiesEntry 4 }

wmanIfBsOfdmaCapMobilityFeature OBJECT-TYPE
        SYNTAX      WmanIfOfdmaMobility
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The field indicates the mobility hand-over, Sleepmode,
             and Idle-mode supported by BS."
        ::= { wmanIfBsOfdmaCapabilitiesEntry 5 }

wmanIfBsOfdmaCapabilitiesConfigTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF WmanIfBsOfdmaCapabilitiesConfigEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This table contains the configuration for basic
             capabilities of BS, specific to OFDMA Phy. The table is
             intended to be used to restrict the Capabilities
             implemented by BS, for example in order to comply with
             local regulatory requirements. The BS should use the
             configuration along with the implemented Capabilities
             (wmanIfBsOfdmaPhyTable) for negotiation of basic
             capabilities with SS using RNG-RSP, SBC-RSP and REG-RSP
             messages. The negotiated capabilities are obtained by
             interSubclause of MS reported capabilities, BS raw
             capabilities and BS configured capabilities. The objects
             in the table have read-write access. The rows are created
             by BS as a copy of wmanIfBsBasicCapabilitiesTable
             and can be modified by NMS."
        ::= { wmanIfBsOfdmaPhy 8 }

wmanIfBsOfdmaCapabilitiesConfigEntry OBJECT-TYPE
        SYNTAX      WmanIfBsOfdmaCapabilitiesConfigEntry
```

```
                MAX-ACCESS  not-accessible
                STATUS      current
                DESCRIPTION
                    "This table provides one row for each BS sector and is
                     indexed by ifIndex."
                INDEX { ifIndex }
                ::= { wmanIfBsOfdmaCapabilitiesConfigTable 1 }

        WmanIfBsOfdmaCapabilitiesConfigEntry ::= SEQUENCE {
                wmanIfBsOfdmaCapCfgFftSizes             WmanIfOfdmFftSizes,
                wmanIfBsOfdmaCapCfgDemodulator          WmanIfOfdmaMsDeModType,
                wmanIfBsOfdmaCapCfgModulator            WmanIfOfdmaMsModType,
                wmanIfBsOfdmaCapCfgPermutation          WmanIfOfdmaPermutation,
                wmanIfBsOfdmaCapCfgMobilityFeature      WmanIfOfdmaMobility}

        wmanIfBsOfdmaCapCfgFftSizes OBJECT-TYPE
                SYNTAX      WmanIfOfdmFftSizes
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the FFT sizes configured for the BS."
                ::= { wmanIfBsOfdmaCapabilitiesConfigEntry 1 }

        wmanIfBsOfdmaCapCfgDemodulator OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMsDeModType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the different demodulator options
                     configured for the BS."
                ::= { wmanIfBsOfdmaCapabilitiesConfigEntry 2 }

        wmanIfBsOfdmaCapCfgModulator OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMsModType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the different modulator options
                     configured for the BS."
                ::= { wmanIfBsOfdmaCapabilitiesConfigEntry 3 }

        wmanIfBsOfdmaCapCfgPermutation OBJECT-TYPE
                SYNTAX      WmanIfOfdmaPermutation
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "This field indicates the OFDMA MS Permutation support
                     configured for the BS."
                ::= { wmanIfBsOfdmaCapabilitiesConfigEntry 4 }

        wmanIfBsOfdmaCapCfgMobilityFeature OBJECT-TYPE
                SYNTAX      WmanIfOfdmaMobility
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION
                    "The field indicates the mobility hand-over, Sleepmode,
                     and Idle-mode configured for the BS."
                ::= { wmanIfBsOfdmaCapabilitiesConfigEntry 5 }
```