Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Proposed text and ASN.1 code for QoS Management**
Date Submitted	**2007-05-02**
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Re:	
Abstract	This contribution proposes the text and ASN.1 code in wmanIf2Mib to support QoS management.
Purpose	Adoption
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1. Introduction

This contribution proposes the text and ASN.1 code in wmanIf2Mib to support QoS management.

2. Proposed changes

2.1 wmanIf2Mib Change

13.1.3.3 wmanIf2CmnObjects

13.1.3.3.2 wmanIf2CmnCps

[Change Figure 13 as the following:]

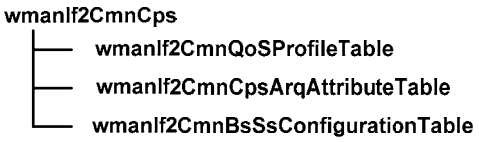

Figure 13—wmanIf2CmnCps structure

[Change the following subclause as below:]

~~**13.1.3.3.2.1 wmanIf2CmnCpsServiceFlowTable**~~

~~**wmanIf2CmnCpsServiceFlowTable contains Service Flow managed objects that are common in BS and SS.**~~

13.1.3.3.2.1 wmanIf2CmnQoSProfileTable

wmanIf2CmnQoSProfileTable contains QoS profiles that are associated with service flows or CIDs via the wmanIf2CmnQoSProfileIndex.

13.1.3.3.2.2 wmanIf2CmnArqAttributeTable

wmanIf2CmnArqAttributeTable contains ARQ parameters that are associated with the Service Flows.

2.2 ASN.1 Code Change

13.2 ASN.1 Definitions of MIB Modules

13.2.2 wmanIf2Mib

[Delete the following ASN.1 code:]

```
wmanIf2CmnCpsServiceFlowTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF WmanIf2CmnCpsServiceFlowEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This table contains Service Flow managed objects that
             are common in BS and SS."
        ::= { wmanIf2CmnCps 1 }

wmanIf2CmnCpsServiceFlowEntry OBJECT-TYPE
        SYNTAX      WmanIf2CmnCpsServiceFlowEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This table provides one row for each created service
             flow for a given MacAddress, and is indexed by ifIndex,
             wmanIf2CmnCpsCpsSfMacAddress, and wmanIf2CmnCpsSfId.
             IfIndex is associated with the BS sector."
        INDEX     { ifIndex, wmanIf2CmnCpsSfMacAddress,
                    wmanIf2CmnCpsSfId  }
        ::= { wmanIf2CmnCpsServiceFlowTable 1 }

WmanIf2CmnCpsServiceFlowEntry::= SEQUENCE {
        wmanIf2CmnCpsSfMacAddress                MacAddress,
        wmanIf2CmnCpsSfId                        Unsigned32,
        wmanIf2CmnCpsSfCid                       WmanIf2CidType,
        wmanIf2CmnCpsSfDirection                 INTEGER,
        wmanIf2CmnCpsSfState                     WmanIf2SfState,
        wmanIf2CmnCpsTrafficPriority             INTEGER,
        wmanIf2CmnCpsMaxSustainedRate            Unsigned32,
        wmanIf2CmnCpsMaxTrafficBurst             Unsigned32,
        wmanIf2CmnCpsMinReservedRate             Unsigned32,
        wmanIf2CmnCpsToleratedJitter             Unsigned32,
        wmanIf2CmnCpsMaxLatency                  Unsigned32,
        wmanIf2CmnCpsFixedVsVariableSduInd       INTEGER,
        wmanIf2CmnCpsSduSize                     Unsigned32,
        wmanIf2CmnCpsSfSchedulingType            WmanIf2SfSchedulingType,
        wmanIf2CmnCpsArqEnable                   TruthValue,
        wmanIf2CmnCpsArqWindowSize               INTEGER,
        wmanIf2CmnCpsArqBlockLifetime            INTEGER,
        wmanIf2CmnCpsArqSyncLossTimeout          INTEGER,
        wmanIf2CmnCpsArqDeliverInOrder           TruthValue,
        wmanIf2CmnCpsArqRxPurgeTimeout           INTEGER,
        wmanIf2CmnCpsArqBlockSize                INTEGER,
        wmanIf2CmnCpsMinRsvdTolerableRate        Unsigned32,
        wmanIf2CmnCpsReqTxPolicy                 BITS,
        wmanIf2CmnSfCsSpecification              WmanIf2CsSpecification,
        wmanIf2CmnCpsTargetSaid                  INTEGER}

wmanIf2CmnCpsSfMacAddress OBJECT-TYPE
        SYNTAX      MacAddress
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "When this table is implemented on the basestation, this
             object contains the SS Mac address, the reported service
             flow was created for. On the SS, the value returned is
             the SS's own Mac address."
        ::= { wmanIf2CmnCpsServiceFlowEntry 1 }

wmanIf2CmnCpsSfId OBJECT-TYPE
        SYNTAX      Unsigned32 ( 1 .. 4294967295)
        MAX-ACCESS  read-only
        STATUS      current
```

```
        DESCRIPTION
                "A 32 bit quantity that uniquely identifies a service flow
                 to both the subscriber station and base station (BS)."
        ::= { wmanIf2CmnCpsServiceFlowEntry 2 }

wmanIf2CmnCpsSfCid OBJECT-TYPE
        SYNTAX      WmanIf2CidType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "A 16 bit channel identifier to identify the connection
                 being created by DSA."
        ::= { wmanIf2CmnCpsServiceFlowEntry 3 }

wmanIf2CmnCpsSfDirection OBJECT-TYPE
        SYNTAX      INTEGER {downstream(1),
                             upstream(2)}
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "An attribute indicating the service flow is downstream or
                 upstream."
        ::= { wmanIf2CmnCpsServiceFlowEntry 4 }

wmanIf2CmnCpsSfState OBJECT-TYPE
        SYNTAX      WmanIf2SfState
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "wmanIf2CmnCpsSfState indicates the service flow state:
                 Authorized (1), Admitted (2), and Active (3) service
                 flow state."
        REFERENCE
                "Subclause 6.3.14.6, in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnCpsServiceFlowEntry 5 }

wmanIf2CmnCpsTrafficPriority OBJECT-TYPE
        SYNTAX      INTEGER (0 .. 7)
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The value of this parameter specifies the priority
                 assigned to a service flow. For uplink service flows,
                 the BS should use this parameter when determining
                 precedence in request service and grant generation,
                 and the SS shall preferentially select contention
                 Request opportunities for Priority Request CIDs
                 based on this priority"
        REFERENCE
                "Subclause 11.13.5 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnCpsServiceFlowEntry 6 }

wmanIf2CmnCpsMaxSustainedRate OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "b/s"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "This parameter defines the peak information rate
                 of the service. The rate is expressed in bits per
                 second and pertains to the SDUs at the input to
                 the system."
        REFERENCE
                "Subclause 11.13.6 in IEEE Std 802.16-2004"
```

```
        ::= { wmanIf2CmnCpsServiceFlowEntry 7 }

wmanIf2CmnCpsMaxTrafficBurst OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "byte"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This parameter defines the maximum burst size that
             must be accommodated for the service."
        REFERENCE
            "Subclause 11.13.7 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnCpsServiceFlowEntry 8 }

wmanIf2CmnCpsMinReservedRate OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "byte"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This parameter specifies the minimum rate reserved
             for this service flow."
        REFERENCE
            "Subclause 11.13.8 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnCpsServiceFlowEntry 9 }

wmanIf2CmnCpsToleratedJitter OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This parameter defines the Maximum delay
             variation (jitter) for the connection."
        REFERENCE
            "Subclause 11.13.13 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnCpsServiceFlowEntry 10 }

wmanIf2CmnCpsMaxLatency OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this parameter specifies the maximum
             latency between the reception of a packet by the BS
             or SS on its network interface and the forwarding
             of the packet to its RF Interface."
        REFERENCE
            "Subclause 11.13.14 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnCpsServiceFlowEntry 11 }

wmanIf2CmnCpsFixedVsVariableSduInd OBJECT-TYPE
        SYNTAX      INTEGER {variableLength(0),
                             fixedLength(1)}
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this parameter specifies whether the SDUs
             on the service flow are variable length (0) or
             fixed length (1). The parameter is used only if
             packing is on for the service flow. The default value
             is 0, i.e.,variable length SDUs."
        REFERENCE
```

~~"Subclause 11.13.15 in IEEE Std 802.16-2004"~~
~~DEFVAL { variableLength }~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 12 }~~

~~wmanIf2CmnCpsSduSize OBJECT-TYPE~~
~~SYNTAX Unsigned32~~
~~UNITS "byte"~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The value of this parameter specifies the length of the SDU for a fixed length SDU service flow. This parameter is used only if packing is on and the service flow is indicated as carrying fixed-length SDUs. The default value is 49 bytes, i.e., VC switched ATM cells with PHS. The parameter is relevant for both ATM and Packet Convergence Sublayers."~~
~~REFERENCE~~
~~"Subclause 11.13.16 in IEEE Std 802.16-2004"~~
~~DEFVAL { 49 }~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 13 }~~

~~wmanIf2CmnCpsSfSchedulingType OBJECT-TYPE~~
~~SYNTAX WmanIf2SfSchedulingType~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"Specifies the upstream scheduling service used for upstream service flow. If the referenced parameter is not present in the corresponding 802.16 QOS Parameter Set of an upstream service flow, the default value of this object is bestEffort(2)."~~
~~REFERENCE~~
~~"Subclause 11.13.11 in IEEE Std 802.16-2004"~~
~~DEFVAL { bestEffort }~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 14 }~~

~~wmanIf2CmnCpsArqEnable OBJECT-TYPE~~
~~SYNTAX TruthValue~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"True(1) ARQ enabling is requested for the connection."~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 15 }~~

~~wmanIf2CmnCpsArqWindowSize OBJECT-TYPE~~
~~SYNTAX INTEGER (1..1024)~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"Indicates the maximum number of unacknowledged fragments at any time."~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 16 }~~

~~wmanIf2CmnCpsArqBlockLifetime OBJECT-TYPE~~
~~SYNTAX INTEGER (0 .. 65535)~~
~~UNITS "10 us"~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The maximum time interval an ARQ fragment will be managed by the transmitter ARQ machine, once initial transmission of the fragment has occured. If transmission or retransmission of the fragment~~

~~is not acknowledged by the receiver before the time limit is reached, the fragment is discarded. A value of 0 means Infinite."~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 17 }~~

~~wmanIf2CmnCpsArqSyncLossTimeout OBJECT-TYPE~~
~~SYNTAX INTEGER (0 .. 65535)~~
~~UNITS "10 us"~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The maximum interval before declaring a loss of synchronization of the sender and receiver state machines. A value of 0 means Infinite."~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 18 }~~

~~wmanIf2CmnCpsArqDeliverInOrder OBJECT-TYPE~~
~~SYNTAX TruthValue~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"Indicates whether or not data is to be delivered by the receiving MAC to its client application in the order in which data was handed off to the originating MAC."~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 19 }~~

~~wmanIf2CmnCpsArqRxPurgeTimeout OBJECT-TYPE~~
~~SYNTAX INTEGER (0 .. 65535)~~
~~UNITS "10 us"~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"Indicates the time interval the ARQ window is advanced after a fragment is received. A value of 0 means Infinite."~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 20 }~~

~~wmanIf2CmnCpsArqBlockSize OBJECT-TYPE~~
~~SYNTAX INTEGER (1..2040)~~
~~UNITS "byte"~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"This value of this parameter specifies the size of an ARQ block. This parameter shall be established by negotiation during the connection creation dialog."~~
~~REFERENCE~~
~~"Subclause 11.13.18.8 in IEEE Std 802.16-2004"~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 21 }~~

~~wmanIf2CmnCpsMinRsvdTolerableRate OBJECT-TYPE~~
~~SYNTAX Unsigned32~~
~~UNITS "b/s"~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"Minimum Tolerable Traffic Rate = R (bits/sec) with time base T(sec) means the following. Let S denote additional demand accumulated at the MAC SAP of the transmitter during an arbitrary time interval of the length T. Then the amount of data forwarded at the receiver to CS (in bits) during this interval should be not less than min {S, R * T}."~~

~~REFERENCE~~
~~"Subclause 11.13.9 in IEEE Std 802.16-2004"~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 22 }~~

~~wmanIf2CmnCpsReqTxPolicy OBJECT-TYPE~~
~~SYNTAX BITS {noBroadcastBwReq(0),~~
~~reserved1(1),~~
~~noPiggybackReq(2),~~
~~noFragmentData(3),~~
~~noPHS(4),~~
~~noSduPacking(5),~~
~~noCrc(6),~~
~~reserved2(7)}~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The value of this parameter provides the capability to specify certain attributes for the associated service flow. An attribute is enabled by setting the corresponding bit position to 1."~~
~~REFERENCE~~
~~"Subclause 11.13.12 in IEEE Std 802.16-2004"~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 23 }~~

~~wmanIf2CmnSfCsSpecification OBJECT-TYPE~~
~~SYNTAX WmanIf2CsSpecification~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"This parameter specifies the convergence sublayer encapsulation mode."~~
~~REFERENCE~~
~~"Subclause 11.13.19.1 in IEEE Std 802.16-2004"~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 24 }~~

~~wmanIf2CmnCpsTargetSaid OBJECT-TYPE~~
~~SYNTAX INTEGER (0 .. 65535)~~
~~MAX-ACCESS read-only~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The target SAID parameter indicates the SAID onto which the service flow being set up shall be mapped."~~
~~REFERENCE~~
~~"Subclause 11.13.17 in IEEE Std 802.16-2004"~~
~~::= { wmanIf2CmnCpsServiceFlowEntry 25 }~~

[Add the following ASN.1 code:]

```
wmanIf2CmnQoSProfileTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF WmanIf2CmnQoSProfileEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This table contains QoS profiles that are associated with
             service flows or CIDs via the wmanIf2CmnQoSProfileIndex.

             The following table shows the required parameters for
             different UL grant scheduling type.
                 0   - not required
                 1   - required
                 0-1 - optional
```

```
                QoS Parameters                BE  ertPS  UGS  rtPS  nrtPS
                ------------------------------------------------------------
                Traffic priority              0-1  0-1    0    0-1   0-1
                Max sustained traffic rate    0-1  0-1    0    0-1   0-1
                Min reserved traffic rate      0    1     1     1     1
                Minimum traffic burst          0   0-1    0    0-1   0-1
                Tolerated jitter               0   0-1   0-1    0     0
                Maximum latency                0    1     1     1     0
                Unsolicited Grant Interval     0    1     1     0     0
                SDU size                       0    0    0-1    0     0
                Unsolicited Polling Interval   0    0     0     1     0"
            REFERENCE
                "Subclause 6.3.14.4 in IEEE Std 802.16-2004"
            ::= { wmanIf2CmnCps 1 }

    wmanIf2CmnQoSProfileEntry OBJECT-TYPE
            SYNTAX      WmanIf2CmnQoSProfileEntry
            MAX-ACCESS  not-accessible
            STATUS      current
            DESCRIPTION
                "This table provides one row for each QoS parameter Set."
            INDEX { ifIndex, wmanIf2CmnQoSProfileIndex }
            ::= { wmanIf2CmnQoSProfileTable 1 }

    WmanIf2CmnQoSProfileEntry ::= SEQUENCE {
            wmanIf2CmnQoSProfileIndex               INTEGER,
            wmanIf2CmnQosServiceClassName           OCTET STRING,
            wmanIf2CmnQosUlGrantScheduleType        WmanIf2SchedulingType,
            wmanIf2CmnQoSTrafficPriority            INTEGER,
            wmanIf2CmnQoSMaximumSustainedRate       Unsigned32,
            wmanIf2CmnQoSMinimumReservedRate        Unsigned32,
            wmanIf2CmnQoSMaximumTrafficBurst        Unsigned32,
            wmanIf2CmnQoSToleratedJitter            Unsigned32,
            wmanIf2CmnQoSMaxLatency                 Unsigned32,
            wmanIf2CmnQoSUnsolicitedGrantInterval   Unsigned32,
            wmanIf2CmnQoSSduSize                    Unsigned32,
            wmanIf2CmnQoSUnsolicitedPollInterval    Unsigned32}

    wmanIf2CmnQoSProfileIndex OBJECT-TYPE
            SYNTAX      INTEGER (1 .. 65535)
            MAX-ACCESS  not-accessible
            STATUS      current
            DESCRIPTION
                "The index value which uniquely identifies an entry in the
                 wmanIf2CmnQoSProfileTable"
            ::= { wmanIf2CmnQoSProfileEntry 1 }

    wmanIf2CmnQosServiceClassName  OBJECT-TYPE
            SYNTAX      OCTET STRING (SIZE(2..128))
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "This object is the Null-terminated string of ASCII
                 characters. It refers to a predefined BS service
                 configuration to be used for a service flow."
            REFERENCE
                "Subclause 11.13.3 in IEEE Std 802.16-2004"
            ::= { wmanIf2CmnQoSProfileEntry 2 }

    wmanIf2CmnQosUlGrantScheduleType OBJECT-TYPE
            SYNTAX      WmanIf2SchedulingType
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
```

```
                "This parameter specifies the Uplink grant scheduling type
                 that shall be enabled for the associated uplink service
                 flow upstream service flow. If the parameter is not
                 present in the corresponding 802.16 QOS Parameter Set of
                 an upstream service flow, the default value is assumed."
            REFERENCE
                "Subclause 11.13.11 in IEEE Std 802.16e-2004"
            DEFVAL      {bestEffort}
            ::= { wmanIf2CmnQoSProfileEntry 3 }

    wmanIf2CmnQoSTrafficPriority OBJECT-TYPE
            SYNTAX      INTEGER (0..7)
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "The value of this parameter specifies the priority assigned
                 to a service flow. For uplink service flows, the BS should
                 use this parameter when determining precedence in request
                 service and grant generation, Higher numbers indicate
                 higher priority"
            REFERENCE
                "Subclause 11.13.5 in IEEE Std 802.16e-2005"
            ::= { wmanIf2CmnQoSProfileEntry 4 }

    wmanIf2CmnQoSMaximumSustainedRate OBJECT-TYPE
            SYNTAX      Unsigned32
            UNITS       "bps"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "This parameter defines the peak information rate of the
                 service. The rate is expressed in bits per second and
                 pertains to the SDUs at the input to the Convergence
                 Sublayer."
            REFERENCE
                "Subclause 11.13.6 in IEEE Std 802.16e-2005"
            ::= { wmanIf2CmnQoSProfileEntry 5 }

    wmanIf2CmnQoSMinimumReservedRate OBJECT-TYPE
            SYNTAX      Unsigned32
            UNITS       "bps"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "This parameter specifies the minimum rate reserved for this
                 service flow. It specifies the minimum amount of data to be
                 transported on behalf of the service flow when averaged
                 over time."
            REFERENCE
                "Subclause 11.13.8 in IEEE Std 802.16e-2004"
            ::= { wmanIf2CmnQoSProfileEntry 6 }

    wmanIf2CmnQoSMaximumTrafficBurst OBJECT-TYPE
            SYNTAX      Unsigned32
            UNITS       "byte"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "This parameter defines the maximum burst size that must be
                 accommodated for the service. It defines the maximum
                 continuous burst the system should accommodate for the
                 service assuming the service is not currently using any of
                 its available resources."
            REFERENCE
```

```
            "Subclause 11.13.7 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnQoSProfileEntry 7 }

wmanIf2CmnQoSToleratedJitter OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This parameter defines the Maximum delay variation (jitter)
             for the connection."
        REFERENCE
            "Subclause 11.13.13 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnQoSProfileEntry 8 }

wmanIf2CmnQoSMaxLatency OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This parameter specifies the maximum latency between the
             ingress of a packet to the Convergence Sublayer and the
             forwarding of the SDU to its Air Interface."
        REFERENCE
            "Subclause 11.13.14 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnQoSProfileEntry 9 }

wmanIf2CmnQoSUnsolicitedGrantInterval OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This object specifies the nominal interval between
             successive data grant opportunities for a service flow."
        REFERENCE
            "Subclause 11.13.20 in IEEE Std 802.16e-2004"
        ::= { wmanIf2CmnQoSProfileEntry 10 }

wmanIf2CmnQoSSduSize OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "byte"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This parameter specifies the length of the SDU for a
             fixed-length SDU service flow. It is used only if packing
             is on and the service flow is indicated as carrying
             fixed-length SDUs. If this object is omitted in the QoS
             parameter set, it should return 0 that means the
             variable-length service flow."
        REFERENCE
            "Subclause 11.13.16 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnQoSProfileEntry 11 }

wmanIf2CmnQoSUnsolicitedPollInterval OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This object specifies the maximal nominal interval between
             successive polling grants opportunities for this Service
```

```
                Flow."
            REFERENCE
                "Subclause 11.13.21 in IEEE Std 802.16e-2004"
            ::= { wmanIf2CmnQoSProfileEntry 12 }

    -- XXX
    wmanIf2CmnArqAttributeTable OBJECT-TYPE
            SYNTAX      SEQUENCE OF WmanIf2CmnArqAttributeEntry
            MAX-ACCESS  not-accessible
            STATUS      current
            DESCRIPTION
                "This table contains ARQ parameters that are associated
                 with the Service Flows."
            ::= { wmanIf2CmnCps 2 }

    wmanIf2CmnArqAttributeEntry OBJECT-TYPE
            SYNTAX      WmanIf2CmnArqAttributeEntry
            MAX-ACCESS  not-accessible
            STATUS      current
            DESCRIPTION
                "This table provides one row for each created service flow
                 for a given MacAddress, and is indexed by ifIndex, and
                 wmanIf2CmnArqIndex. IfIndex is associated with the BS
                 sector."
            INDEX     { ifIndex, wmanIf2CmnArqIndex  }
            ::= { wmanIf2CmnArqAttributeTable 1 }

    WmanIf2CmnArqAttributeEntry::= SEQUENCE {
            wmanIf2CmnArqIndex                      INTEGER,
            wmanIf2CmnArqEnable                     TruthValue,
            wmanIf2CmnArqWindowSize                 INTEGER,
            wmanIf2CmnArqBlockLifetime              INTEGER,
            wmanIf2CmnArqSyncLossTimeout            INTEGER,
            wmanIf2CmnArqDeliverInOrder             TruthValue,
            wmanIf2CmnArqRxPurgeTimeout             INTEGER,
            wmanIf2CmnArqBlockSize                  INTEGER,
            wmanIf2CmnArqAckProcessingTime          INTEGER}

    wmanIf2CmnArqIndex OBJECT-TYPE
            SYNTAX      INTEGER ( 1 .. 65535)
            MAX-ACCESS  not-accessible
            STATUS      current
            DESCRIPTION
                "The index value which uniquely identifies an entry in the
                 in the wmanIf2CmnArqAttributeTable."
            ::= { wmanIf2CmnArqAttributeEntry 1 }

    wmanIf2CmnArqEnable OBJECT-TYPE
            SYNTAX      TruthValue
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "True(1) ARQ enabling is requested for the connection."
            ::= { wmanIf2CmnArqAttributeEntry 2 }

    wmanIf2CmnArqWindowSize       OBJECT-TYPE
            SYNTAX      INTEGER (1..1024)
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "Indicates the maximum number of unacknowledged fragments
                 at any time."
            ::= { wmanIf2CmnArqAttributeEntry 3 }
```

```
wmanIf2CmnArqBlockLifetime OBJECT-TYPE
        SYNTAX      INTEGER (0 .. 65535)
        UNITS       "10 us"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The maximum time interval an ARQ fragment will be managed
             by the transmitter ARQ machine, once initial transmission
             of the fragment has occured. If transmission or
             retransmission of the fragment is not acknowledged by the
             receiver before the time limit is reached, the fragment is
             discarded. A value of 0 means Infinite."
        ::= { wmanIf2CmnArqAttributeEntry 4 }

wmanIf2CmnArqSyncLossTimeout OBJECT-TYPE
        SYNTAX      INTEGER (0 .. 65535 )
        UNITS       "10 us"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The maximum interval before declaring a loss of
             synchronization of the sender and receiver state machines.
             A value of 0 means Infinite."
        ::= { wmanIf2CmnArqAttributeEntry 5 }

wmanIf2CmnArqDeliverInOrder  OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Indicates whether or not data is to be delivered by the
             receiving MAC to its client application in the order in
             which data was handed off to the originating MAC."
        ::= { wmanIf2CmnArqAttributeEntry 6 }

wmanIf2CmnArqRxPurgeTimeout  OBJECT-TYPE
        SYNTAX      INTEGER (0 .. 65535)
        UNITS       "10 us"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Indicates the time interval the ARQ window is advanced
             after a fragment is received. A value of 0 means
             Infinite."
        ::= { wmanIf2CmnArqAttributeEntry 7 }

wmanIf2CmnArqBlockSize OBJECT-TYPE
        SYNTAX      INTEGER (1..2040)
        UNITS       "byte"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "This value of this parameter specifies the size of an ARQ
             block. This parameter shall be established by negotiation
             during the connection creation dialog."
        REFERENCE
            "Subclause 11.13.18.8 in IEEE Std 802.16-2004"
        ::= { wmanIf2CmnArqAttributeEntry 8 }

wmanIf2CmnArqAckProcessingTime OBJECT-TYPE
        SYNTAX      INTEGER (0 .. 255)
        UNITS       "millisecond"
        MAX-ACCESS  read-only
        STATUS      current
```

```
            DESCRIPTION
                "This parameter indicates the number of ms required by the
                 ARQ receiver to process the received ARQ blocks and provide
                 a valid ACK or NAK."
            REFERENCE
                "Subclause 11.13.18.9 in IEEE Std 802.16e-2005"
            ::= { wmanIf2CmnArqAttributeEntry 9 }
```