IEEE 802.11
Wireless Access Methods and Physical Layer Specifications

TITLE: Proposed Text Change for MIB Variables
                    Section 9 of Draft 1 Revision 2

DATE: July 10-13th,1995

AUTHOR: Ed Geiger
                       Apple Computer
                       One Infinite Loop
                       Cupertino, CA 95014
                       edg@apple.com

Introduction

During the July meeting, the joint meeting of the PHY group determined additional changes are required to the PHY MIB to support the PHY operation. The following text shows the required changes for the PHY MIB section.

Physical Layer Management

This section covers the attribute definitions and templates of PHY layer management. This includes both the PHY-dependent and the PHY-independent portions of the PHY-layer Management Information Base. Not all attributes in the following section are supported by every PHY. Each PHY contains a Managed Object list which defines the PHY-specific values required for each PHY implementation.

PHY Management Information Base

Phy Attributes

agPhyOperation_grp

    aPHY_Type,
    aReg_Domains_Suprt,
    aCurrent_Reg_Domain,
    aSlot_Time,
    aCCA_Asmnt_Time,
    aRxTx_Turnaround_Time,
    aTx_PLCP_Delay,
    aRxTx_Switch_Time,
    aTxRamp_On_Time,
    aTx_RF_Delay,
    aSIFS_Time,
    aRx_RF_Delay,
    aRx_PLCP_Delay,
    aMAC_Prc_Delay,
    aTxRamp_Off_Time;
    ~~aCCA_Watchdog_Timer_Max,~~
    ~~aCCA_Watchdog_Count_Max,~~
    ~~aCCA_Watchdog_Timer_Min,~~
    ~~aCCA_Watchdog_Count_Min;~~

agPhyRate_grp

    aSuprt_Data_Rates_Tx,
    aSuprt_Data_Rates_Rx,
    aMPDU_Max_Lngth ~~1M~~,
    ~~aMPDU_Max_Lngth_2M;~~
    aPref_Max_MPDU_Frgmnt_Lngth;

agPhyAntenna_grp

    aSuprt_Tx_Antennas,
    aCurrent_Tx_Antenna,
    aSuprt_Rx_Antennas,
    aDiversity_Suprt,
    aDiversity_Slct_Rx;

agPhyTxPwr_grp

        aNbr_Suprtd_Pwr_Lvls,
        aTx_Pwr_Lvl1,
        aTx_Pwr_Lvl2,
        aTx_Pwr_Lvl3,
        aTx_Pwr_Lvl4,
        aTx_Pwr_Lvl5,
        aTx_Pwr_Lvl6,
        aTx_Pwr_Lvl7,
        aTx_Pwr_Lvl8,
        aCurrent_Tx_PwrLvl;

agPhyFHSS_grp

        aHop_Time,
        aCurrent_Channel_Nbr,
        aMax_Dwell_Time,
        aCurrent_Dwell_Time,
        aCurrent_Set,
        aCurrent_Pattern,
        aCurrent_Index;

agPhyStatus_grp

        aSynthesizer_Locked;

Not Grouped

PHY Object Class

PHY MANAGED OBJECT CLASS
DERIVED FROM "ISO/IEC 10165-2":top;
CHARACTERIZED BY
        pPHY_base   PACKAGE
                BEHAVIOR
                        bPHY_base BEHAVIOR
                        DEFINED AS "The PHY object class provides the necessary support for all the
                        required PHY operational information which may vary from PHY to PHY and from
                        STA to STA to be communicated to upper layers."
                        ATTRIBUTES

        aPHY_Type   GET,
        aReg_Domains_Suprt   GET,
        aCurrent_Reg_Domain   GET-REPLACE,
        aSlot_Time   GET,
        aCCA_Asmnt_Time   GET,
        aRxTx_Turnaround_Time   GET,
        aTx_PLCP_Delay   GET,
        aRxTx_Switch_Time   GET,
        aTxRamp_On_Time   GET,
        aTx_RF_Delay   GET,
        aSIFS_Time   GET,

```
        aRx_RF_Delay                                 GET,
        aRx_PLCP_Delay                               GET,
        aMAC_Prc_Delay                               GET,
        aTxRamp_Off_Time                             GET,
        aCCA_Watchdog_Timer_Max                      GET-REPLACE,
        aCCA_Watchdog_Count_Max                      GET-REPLACE,
        aCCA_Watchdog_Timer_Min                      GET,
        aCCA_Watchdog_Count_Min                      GET,
        aSuprt_Data_Rates_Tx          .              GET,
        aSuprt_Data_Rates_Rx                         GET,
        aMPDU_Max_Lngth_1M                           GET,
        aMPDU_Max_Lngth_2M                           GET,
        aPref_Max_MPDU_Frgmnt_Lngth                  GET-REPLACE,
        aSuprt_Tx_Antennas                           GET,
        aCurrent_Tx_Antenna                          GET-REPLACE,
        aSuprt_Rx_Antennas                           GET,
        aDiversity_Suprt                             GET,
        aDiversity_Slct_Rx                           GET-REPLACE,
        aNbr_Suprtd_Pwr_Lvls                         GET,
        aTx_Pwr_Lvl_1                                GET,
        aTx_Pwr_Lvl_2                                GET,
        aTx_Pwr_Lvl_3                                GET,
        aTx_Pwr_Lvl_4                                GET,
        aTx_Pwr_Lvl_5                                GET,
        aTx_Pwr_Lvl_6                                GET,
        aTx_Pwr_Lvl_7                                GET,
        aTx_Pwr_Lvl_8                                GET,
        aCurrent_Tx_PwrLvl                           GET-REPLACE,
        aHop_Time                                    GET,
        aCurrent_Channel_Nbr             .           GET-REPLACE,
        aMax_Dwell_Time                              GET,
        aCurrent_Dwell_Time                          GET-REPLACE,
        aCurrent_Set                                 GET-REPLACE,
        aCurrent_Pattern                             GET-REPLACE,
        aCurrent_Index                               GET-REPLACE,
        aSynthesizer_Locked                          GET;
    ATTRIBUTE GROUPS
        agPhyOperation_grp,
        agPhyRate_grp,
        agPhyAntenna_grp,
        agPhyTxPwr_grp,
        agPhyFHSS_grp,
        agPhyStatus_grp;
    ACTIONS
        acPHY_init,
        acPHY_reset;
    NOTIFICATIONS
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY() };
```

PHY Attribute Group Templates

agPhyOperation_grp

PhyOperation_grp ATTRIBUTE GROUP
    GROUP ELEMENTS
        aPHY_Type,
        aReg_Domains_Suprt,
        aCurrent_Reg_Domain,
        aSlot_Time,
        aCCA_Asmnt_Time,
        aRxTx_Turnaround_Time,
        aTx_PLCP_Delay,
        aRxTx_Switch_Time,
        aTxRamp_On_Time,
        aTx_RF_Delay,
        aSIFS_Time,
        aRx_RF_Delay,
        aRx_PLCP_Delay,
        aMAC_Prc_Delay,
        aTxRamp_Off_Time;
        ~~aCCA_Watchdog_Timer_Max,~~
        ~~aCCA_Watchdog_Count_Max,~~
        ~~aCCA_Watchdog_Timer_Min,~~
        ~~aCCA_Watchdog_Count_Min,~~
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyOperation_grp(0) };

agPhyRate_grp

PhyRate_grp ATTRIBUTE GROUP
    GROUP ELEMENTS
        aSuprt_Data_Rates_Tx,
        aSuprt_Data_Rates_Rx,
        aMPDU_Max_Lngth ~~1M~~,
        ~~aMPDU_Max_Lngth_2M,~~
        aPref_Max_MPDU_Frgmnt_Lngth;
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyRate_grp(1) };

agPhyAntenna_grp

PhyAntenna_grp ATTRIBUTE GROUP
    GROUP ELEMENTS
        aSuprt_Tx_Antennas,
        aCurrent_Tx_Antenna,
        aSuprt_Rx_Antennas,
        aDiversity_Suprt,
        aDiversity_Slct_Rx;
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyAntenna_grp(2) };

agPhyTxPwr_grp

```
PhyTxPwr_grp ATTRIBUTE GROUP
     GROUP ELEMENTS
          aNbr_Suprtd_Pwr_Lvls,
          aTx_Pwr_Lvl1,
          aTx_Pwr_Lvl2,
          aTx_Pwr_Lvl3,
          aTx_Pwr_Lvl4,
          aTx_Pwr_Lvl5,
          aTx_Pwr_Lvl6,
          aTx_Pwr_Lvl7,
          aTx_Pwr_Lvl8,
          aCurrent_Tx_PwrLvl;
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyTxPwr_grp(3) };
```

agPhyFHSS_grp

```
PhyFHSS_grp ATTRIBUTE GROUP
     GROUP ELEMENTS
          aHop_Time,
          aCurrent_Channel_Nbr,
          aMax_Dwell_Time,
          aCurrent_Dwell_Time,
          aCurrent_Set,
          aCurrent_Pattern,
          aCurrent_Index;
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyFHSS_grp(4) };
```

agPhyStatus_grp

```
PhyStatus_grp ATTRIBUTE GROUP
     GROUP ELEMENTS
          aSynthesizer_Locked;
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyStatus_grp(5) };
```

PHY Attribute Templates

aPHY_Type

```
PHY_Type ATTRIBUTE
WITH APPROPRIATE SYNTAX
     integer;
BEHAVIOR DEFINED AS
          "This is a 8 bit integer value which identifies the PHY Type supported by the attached PLCP and
          PMD"
          FHSS 2.4GHz = 01 , DSSS 2.4GHz = 02, IR Baseband = 03";
```

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) PHY_Type(33) };

aReg Domains Suprt

Reg_Domains_Suprt ATTRIBUTE
WITH APPROPRIATE SYNTAX
    Null Terminated list of byte integers;
BEHAVIOR DEFINED AS
        "There are different operational requirements dependent on the regulatory domain. This attribute
        list describes the regulatory domains the PLCP and PMD support in this implementation.   Each
        integer is an 8 bit value as defined below:
        FCC = 10, DOC = 20, ETSI = 30, MKK = 40";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Reg_Domains_Suprt(33) };

aCurrent Reg Domain

Current_Reg_Domain ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "This octet defines the current regulatory domain this implementation of the PMD is supporting.
        This octet corresponds to one of the Reg_Domains list in the Reg_Domains_Suprt attribute list";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Reg_Domain(33)
    };

aSlot Time

Slot_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The time in microseconds the MAC will use for defining the PIFS and DIFS periods. The
        Slot_Time is defined as a function of the following the equation:
        CCA_Asmnt_Time + RxTx_Turnaround_Time + Air_Propagation_Time.
        Air_Propagation_Time is defined as 1 usec.";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Slot_Time(33) };

aCCA Asmnt Time

CCA_Asmnt_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The minimum time in microseconds the CCA mechanism has available to assess the media
        within every slot to determine whether the media is clear or busy";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) CCA_Asmnt_Time(33) };

aRxTx Turnaround Time

RxTx_Turnaround_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The maximum time in microseconds the PHY requires to change from receive to transmitting the
        start of the first symbol out on the air. The following equation is used to derive the
        RxTx_Turnaround_Time:
        aTx_PLCP_Delay + aRxTx_Switch_Time + aTxRamp_On_Time + aTx_RF_Delay. ";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)
    RxTx_Turnaround_Time(44) };

aTx PLCP Delay

Tx_PLCP_Delay ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The nominal time in microseconds the PLCP uses to deliver a symbol from the MAC interface to
        the transmit data path of the PMD";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_PLCP_Delay(88) };

aRxTx Switch Time

RxTx_Switch_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The nominal time in microseconds the PMD takes to switch from Receive to Transmit";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) RxTx_Switch_Time(88) };

aTxRamp On Time

TxRamp_On_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The maximum time in microseconds the PMD takes to turn the Transmitter on";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) TxRamp_On_Time(88) };

aTx RF Delay

Tx_RF_Delay WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
        "The nominal time in nanoseconds the PMD uses to transfer a symbol through the Transmit path
        of the PMD";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_RF_Delay(88) };

aSIFS_Time

SIFS_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "The time in microseconds the MAC and PHY will require to receive the last symbol of a frame at
    the air interface, process the frame and response with the first symbol on the air interface of the
    earliest possible response. The following equation is used to determine the SIFS_Time:
    aRx_RF_Delay + aRx_PLCP_Delay + aMAC_Prc_Delay +
    aRxTx_Turnaround_Time";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) SIFS_Time(88) };

aRx_RF_Delay

Rx_RF_Delay ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "The nominal time in nanoseconds the PMD uses to deliver a symbol from the antenna to the
    PLCP.";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Rx_RF_Delay(88) };

aRx_PLCP_Delay

Rx_PLCP_Delay ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "The nominal time in nanoseconds the PLCP uses to deliver a bit from the PMD receive path to
    the MAC";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Rx_PLCP_Delay(88) };

aMAC_Prc_Time

MAC_Prc_Delay ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "The nominal time in microseconds the MAC uses to process a frame and prepare a response to
    the frame";

REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MAC_Prc_Delay(88) };

aTxRamp_Off_Time

TxRamp_Off_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
      "The time in nanoseconds the PMD takes to turn the Transmit PA off";

REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) TxRamp_Off_Time(88) };

aCCA_Watchdog_Timer_Max

CCA_Watchdog_Timer_Max ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
      "The time (in hundreds of nanoseconds) at which the watchdog timer in the PMD CCA
      mechanism generates an alarm. The product of aCCA_Watchdog_Timer_Max and the
      aCCA_Watchdog_Count_Max must be set to match the length of the maximum length undecoded
      packet that is to be allowed time to operate.[1]"

REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)
   CCA_Watchdog_Timer_Max(99) };

aCCA_Watchdog_Count_Max

CCA_Watchdog_Count_Max ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
      "The count of alarms which the watchdog counter in the PMD CCA is permitted to generate
      before an undecoded energy detection in the medium is ignored."

REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)
   CCA_Watchdog_Count_Max(1010) };

aCCA_Watchdog_Timer_Min

CCA_Watchdog_Timer_Min ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
      "The minimum time (in hundreds of nanoseconds) to which the aCCA_Watchdog_Timer_Max
      may be set."

REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)
   CCA_Watchdog_Timer_Min(1111) };

---

[1] A default product of 22 msec allows time for 802.11 type maximal length packets.

~~aCCA_Watchdog_Count_Min~~

~~CCA_Watchdog_Count_Min ATTRIBUTE~~
~~WITH APPROPRIATE SYNTAX~~
    ~~integer;~~
~~BEHAVIOR DEFINED AS~~
        ~~"The minimum time (in hundreds of nanoseconds) to which the aCCA_Watchdog_Count_Max~~
        ~~may be set."~~

~~REGISTERED AS~~
        ~~{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)~~
        ~~CCA_Watchdog_Count_Min(1212) };~~

aSuprt_Data_Rates_Tx

Suprt_Data_Rates_Tx ATTRIBUTE
WITH APPROPRIATE SYNTAX
    Null Terminated list of byte integers;
BEHAVIOR DEFINED AS
    "The Transmit bit rates supported by the PLCP and PMD. The following list defines the supported
    transmit data rates:
    1M bps = 01, 2M bps = 02";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt_Data_Rates_Tx
    (2424) };

aSuprt_Data_Rates_Rx

Suprt_Data_Rates_Rx ATTRIBUTE
WITH APPROPRIATE SYNTAX
    Null Terminated list of byte integers;
BEHAVIOR DEFINED AS
    "The receive bit rates supported by the PLCP and PMD. The following list defines the supported
    receive data rates:
    1M bps = 01, 2M bps = 02";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt_Data_Rates_Rx
    (2424) };

aMPDU_Max_Lngth~~_1M~~

MPDU_Max_Lngth~~_1M~~ ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "~~The maximum number of octets in a MPDU that can be load into the PLCP_PDU when transmitting~~
    ~~at 1M bit per second~~Maximum MPDU length the PHY can accept from the MAC sublayer or from the
    media.";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU_Max_Lngth~~_1M~~
    (2424) };

~~aMPDU_Max_Lngth_2M~~

~~MPDU_Max_Lngth_2M ATTRIBUTE~~
~~WITH APPROPRIATE SYNTAX~~
   ~~integer;~~
~~BEHAVIOR DEFINED AS~~
   ~~"The maximum number of octets in a MPDU that can be load into the PLCP_PDU when transmitting~~
   ~~at 2M bit per second";~~
~~REGISTERED AS~~
   ~~{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU_Max_Lngth_2M~~
   ~~(2424) };~~

aPref_Max_MPDU_Frgmnt_Lngth

Pref_Max_MPDU_Frgmnt_Lngth ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "The preferred initial maximum fragment length the MAC will use when fragmenting a packet. This
   variable can be modified by the LME.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)
   Pref_Max_MPDU_Frgmnt_Lngth (2424) };

aSuprt_Tx_Antennas

Suprt_Tx_Antennas ATTRIBUTE
WITH APPROPRIATE SYNTAX
   Null terminated list of integers;
BEHAVIOR DEFINED AS
   "This attribute represent a list of one or more antennas which can be used as the transmit antenna.
   Each antenna is define as an integer starting with antenna 1 to antenna N where N is < or = 255";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt_Tx_Antennas (2424)
   };

aCurrent_Tx_Antenna

Current_Tx_Antenna ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "The current antenna being used to transmit. This value is one of the attributes appearing in the list
   defined as the Suprt_Tx_Antennas.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU_Max_Lngth_1M
   (2424) };

aSuprt_Rx_Antennas

Suprt_Rx_Antennas ATTRIBUTE
WITH APPROPRIATE SYNTAX
    Null terminated list of integers;
BEHAVIOR DEFINED AS
    "This attribute represent a list of one or more antennas which can be used as the transmit antenna.
    Each antenna is define as an integer starting with antenna 1 to antenna N where N is < or = 255.";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt_Rx_Antennas (2424)
    };

aDiversity_Suprt

Diversity_Suprt ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "This attribute defines this implementation's support for diversity. This attribute can have one of three
    values. 01h indicates that diversity is available and performed over a fixed list of antennas define in
    attribute Diversity_Slct_Rx. 02h indicates that diversity is not supported. 03h indicates that diversity
    is supported and that control of diversity is also available. Diversity control indicates that the
    Diversity_Slct_Rx can be dynamically modified by the LME.";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU_Max_Lngth_1M
    (2424) };

aDiversity_Slct_Rx

Diversity_Slct_Rx ATTRIBUTE
WITH APPROPRIATE SYNTAX
    Null terminated list of integers;
BEHAVIOR DEFINED AS
    "This attribute represent a list of one or more antennas which can be used as receive antennas. Each
    antenna is define as an integer starting with antenna 1 to antenna N where N is < or = 255.";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Diversity_Slct_Rx (2424)
    };

aNbr_Suprt_Pwr_Lvls

Nbr_Suprt_Pwr_Lvls ATTRIBUTE
WITH APPROPRIATE SYNTAX
    integer;
BEHAVIOR DEFINED AS
    "This defines the number of power levels supported by the PMD. This attribute can have a value of 1
    to 8.";
REGISTERED AS
    { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Nbr_Suprt_Pwr_Lvls
    (2424) };

aTx_Pwr_Lvl_1

Tx_Pwr_Lvl_1 ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This defines the transmit output power for LEVEL1 in dBm mWatts. This is a nominal value +/- 3
   dB at nominal temperature and voltage. This is also the default power level";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_1 (2424) };

aTx_Pwr_Lvl_2

Tx_Pwr_Lvl_2 ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This defines the transmit output power for LEVEL2 in mWatts dBm. This is a nominal value +/- 3
   dB at nominal temperature and voltage.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_2 (2424) };

aTx_Pwr_Lvl_3

Tx_Pwr_Lvl_3 ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This defines the transmit output power for LEVEL3 in mWatts dBm. This is a nominal value +/- 3
   dB at nominal temperature and voltage.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_3 (2424) };

aTx_Pwr_Lvl_4

Tx_Pwr_Lvl_4 ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This defines the transmit output power for LEVEL4 in mWatts dBm. This is a nominal value +/- 3
   dB at nominal temperature and voltage.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_4 (2424) };

aTx_Pwr_Lvl_5

Tx_Pwr_Lvl_5 ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This defines the transmit output power for LEVEL5 in mWatts dBm. This is a nominal value +/- 3
   dB at nominal temperature and voltage.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_5 (2424) };

aTx_Pwr_Lvl_6

Tx_Pwr_Lvl_6 ATTRIBUTE
WITH APPROPRIATE SYNTAX
     integer;
BEHAVIOR DEFINED AS
     "This defines the transmit output power for LEVEL6 in ~~mWatts~~ dBm. This is a nominal value +/- 3
     dB at nominal temperature and voltage.";
REGISTERED AS
     { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_6 (2424) };

aTx_Pwr_Lvl_7

Tx_Pwr_Lvl_7 ATTRIBUTE
WITH APPROPRIATE SYNTAX
     integer;
BEHAVIOR DEFINED AS
     "This defines the transmit output power for LEVEL7 in ~~mWatts~~ dBm. This is a nominal value +/- 3
     dB at nominal temperature and voltage.";
REGISTERED AS
     { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_7 (2424) };

aTx_Pwr_Lvl_8

Tx_Pwr_Lvl_8 ATTRIBUTE
WITH APPROPRIATE SYNTAX
     integer;
BEHAVIOR DEFINED AS
     "This defines the transmit output power for LEVEL8 in ~~mWatts~~ dBm. This is a nominal value +/- 3
     dB at nominal temperature and voltage.";
REGISTERED AS
     { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx_Pwr_Lvl_8 (2424) };

aCurrent_Tx_PwrLvl

Current_Tx_PwrLvl ATTRIBUTE
WITH APPROPRIATE SYNTAX
     integer;
BEHAVIOR DEFINED AS
     "The Tx_Pwr_Lvl_N currently being used to transmit data. Some PHYs also use this value to
     determine the receiver sensitivity requirements for CCA. ";
REGISTERED AS
     { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Tx_PwrLvl (2424)
     };

aHop_Time

Hop_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
     integer;
BEHAVIOR DEFINED AS
     "The time in ~~milli~~nanoseconds for the PMD to change from channel 2 to 80";
REGISTERED AS
     { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Hop_Time (2424) };

aCurrent_Channel_Nbr

Current_Channel_Nbr ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This defines the current channel number of the frequency loaded in the RF synthesizer";
. REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Channel_Nbr
   (2424) };

aMax_Dwell_Time

Max_Dwell_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "The maximum time in millinanoseconds that the radio can operate on a single channel";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Max_Dwell_Time (2424)
   };

aCurrent_Dwell_Time

Current_Dwell_Time ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "The current time in millinanoseconds that the radio shall operate on a single channel set by the
   LMEMAC";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Dwell_Time
   (2424) };

aCurrent_Set

Current_Set ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This attribute represents the current set of patterns the PHY LME is using to determine the hop
   sequence.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Set (2424) };

aCurrent_Pattern

Current_Pattern ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This attribute represents the current pattern the PHY LME is using to determine the hop sequence.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Pattern (2424) };

aCurrent_Index

Current_Index ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This attribute represents the current index value the PHY LME is using to determine the
   Current_Channel_Nbr.";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current_Index (2424) };

aSynthesizer_Locked

Synthesizer_Locked ATTRIBUTE
WITH APPROPRIATE SYNTAX
   integer;
BEHAVIOR DEFINED AS
   "This is an indication that the PMD's synthesizer is locked to the current channel specified in the
   Current_Channel_Nbr. 00h represents unlocked while FFh represents locked. ";
REGISTERED AS
   { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Synthesizer_Locked (2424)
   };