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**PW ATM Pseudo Wire (PW) Emulation Network Management
Information Base Using SMIV2**

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[1.0](#) Abstract

This memo defines an experimental portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for modeling an adaptation of ATM VCs over a Packet Switch Network (PSN) as defined in the PWE3 Framework [[FRMWK](#)].

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[2.0](#) Introduction

This document describes a Management Information Base for managing ATM VC emulation over a Packet Switched Network(PSN).

This document follows the Requirements for Pseudo-Wire Emulation Edge-to-Edge [[PWREQ](#)] document, The MIB objects closely work with the MIBs described in [[PWMIB](#)] and the textual conventions defined in [[PWTC](#)].

The MIB objects are defined in a way that is not specific to the PSN that is emulating this service.

[3.0](#) Terminology

This document follows the terminology used in PW framework [[FRMWK](#)].

Outbound	References the traffic direction where a ATM Cell is received, adapted to packet, assigned a VC label, and sent into the PSN.
Inbound	The direction where packets are received from the PSN, cells are reconstructed from the packet payloads, and sent into the ATM Network as cells.
Adaptation	Refers to the method of adapting a "foreign" communications protocol such that it can be carried by a packet switched net (the PSN). For example, in a ATM service the foreign protocol is ATM. The PSN may be MPLS.
PSN	Public Switched Network.
PSN Tunnel	A general term indicating a virtual connection between the two PW edge devices. In practice this connection is not limited to path-oriented types of PSNs such as MPLS. An example of a non-path-oriented PSN is an IP PSN.

Conventions used in this document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC-2119](#) [[BCP14](#)].

4.0 The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#) [[RFC2571](#)].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in STD 16, [RFC 1155](#) [[RFC1155](#)], STD 16, [RFC 1212](#) [[RFC1212](#)] and [RFC 1215](#) [[RFC1215](#)]. The second version, called SMIV2, is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, [RFC 1157](#) [[RFC1157](#)]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [[RFC1901](#)] and [RFC 1906](#) [[RFC1906](#)]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [[RFC1906](#)], [RFC 2572](#) [[RFC2572](#)] and [RFC 2574](#) [[RFC2574](#)].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, [RFC 1157](#) [[RFC1157](#)]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [[RFC1905](#)].
- o A set of fundamental applications described in [RFC 2573](#) [[RFC2573](#)] and the view-based access control mechanism described in [RFC 2575](#) [[RFC2575](#)].

A more detailed introduction to the current SNMP Management Framework can be found in [RFC 2570](#) [[RFC2570](#)]. Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI. This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be

semantically equivalent, except where objects or events are omitted
because no translation is possible (use of Counter64). Some machine

readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

4.1 Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to also refer to the object type.

5.0 Feature Checklist

This MIB is designed to satisfy the following requirements and constraints:

- Fit within the architecture defined [[PWMIB](#)].
- Fit within the model for VC definition/management as defined in the [AToM] MIB.
- MIB supports manually configured ATM VCs
- MIB supports automatically configured ATM VCs
- The MIB enables the use of any PSN
- The MIB supports point-to-point ATM VC connections. Point-to-multipoint and multipoint-to-point connections are for future study.
- The MIB allows configuration of all the parameters needed to establish a PW ATM VC.
- The MIB reports: ATM performance metrics for the PW ATM VC. This includes cells received, tagged, rejected, transmitted and lost.
- ATM OAM cell support.
- The MIB does not consider ILMI support

6.0 PW-MIB usage

The MIB structure for defining a PW service is composed of three layers of MIB modules functioning together. This general model is defined in the PWE3 Framework [[FRMWK](#)]. The layering model is intended to sufficiently isolate PW services from the underlying PSN layer that carries the emulated service. This is done at the same time as providing a standard means for connecting any supported services to any supported PSNs.

The first layer known as the service layer contains service-specific modules such as the one defined in this document. These modules define service-specific management objects that interface or collaborate with existing MIB modules for the native version of the

service. The service-specific module "glues" the standard module to the PWE MIB framework.

The next layer of the PWE MIB framework is comprised of the PW-MIB module [[PWMIB](#)]. This module is used to configure general parameters of PW VCs that are common to all types of emulated services and PSNs. This layer is connected to the service-specific layer above, and the PSN layer below.

The PSN layer provides PSN-specific modules for each type of PSN. These modules associate the VC with one or more "tunnels" that carry the service over the PSN. These modules are defined in other documents. This module is used to "glue" the PW service to the underlying PSN-specific MIB modules. In the case of MPLS, for example, the PW-MPLS MIB [[PWMPLSMIB](#)] is used to connect the PW service to either the MPLS-LDP [[LDPMIB](#)] or MPLS-TE [[TEMIB](#)] MIBs.

[PWTC] defines some of the object types used in these modules.

6.1 ATM-PW MIB Usage

In this section we provide an example of using the MIB objects described in [section 8](#) to set up a ATM VC. While this example is not meant to illustrate every permutation of the MIB, it is intended as an aid in the understanding of some key concepts. It is meant to be read after going through the MIB itself. See [[PWMIB](#)] for an example of setting up a PSN Tunnel.

The following example illustrates how a user will set up a AAL5 ATM VC on a switch/router with cells entering the switch/router through ATM Interface with IfIndex 1000, VPI 1 and VCI 100 (from ATM Network to PSN - outbound direction) and on the way back, It goes out of the switch/router through ATM Interface 1000 with VPI 1 and VCI 100 (PSN to ATM Network - inbound

direction)

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First create an entry in PW MIB with pwVcType atmAal5Vcc(2), then create entries in inbound and outbound tables.

In PW ATM MIB

In pwAtmOutboundTable:

```
{
  pwAtmOutboundAtmIf          1000    --Outbound AtmIf
  pwAtmOutboundVpi            1        --Outbound VPI
  pwAtmOutboundVci            100      --Outbound VCI
  pwAtmOutboundTrafficParamDescr 0.0    -- Best Effort
  pwAtmOutboundRowStatus      createAndGo
  pwAtmOutboundClpQosMapping  false(0) --CLP wont be mapped to QoS
  pwAtmOutboundOamCellSupported true(1) --OAM cells will be sent
  pwAtmOutboundOverhead       15
}
```

In pwAtmInboundTable

```
{
  pwAtmInboundAtmIf          1000    --Inbound AtmIf
  pwAtmInboundVpi            1        --Inbound VPI
  pwAtmInboundVci            100      --Inbound VCI
  pwAtmInboundTrafficParamDescr 0.0    --Best Effort
  pwAtmInboundRowStatus      createAndGo
  pwAtmInboundOamCellSupported true(1) --Will accept OAM Cells
}
```

[7.0](#) PW-ATM MIB Summary

This MIB consists of 4 tables.

- PW VC ATM Outbound Table

This Table is used to configure a outbound ATM VC Entry.

- PW VC ATM Inbound Table

This Table is used to configure a inbound ATM VC Entry.

- PW VC ATM Outbound Perf Table

This Table contains the statsistics for an ATM VC Entry in the Outbound direction

- PW VC ATM Inbound Perf Table

This Table contains the statsistics for an ATM VC Entry in the Inbound direction

A TrafficParamDescr Table is not defined as part of this MIB so that users can refer to any ATM TrafficDescr Table (e.g atmTrafficDescrParamTable present in the [AToM] MIB)

8.0 Object Definitions

PW-ATM-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, experimental, Integer32
Counter32, Counter64
FROM SNMPv2-SMI

MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF

TruthValue, RowStatus, RowPointer
FROM SNMPv2-TC

InterfaceIndex
FROM IF-MIB

pwVcIndex
FROM PW-MIB

AtmVpIdentifier, AtmVcIdentifier
FROM ATM-TC-MIB;

pwAtmMIB MODULE-IDENTITY

LAST-UPDATED "200202261200Z" -- 26 February 2002 12:00:00 EST

ORGANIZATION "Pseudo-Wire Emulation Edge-to-Edge (PWE3)
Working Group"

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Discussion and general questions should be posed to
the PWE3 Working Group (pwe3@ietf.org)."

DESCRIPTION

"This MIB contains managed object definitions for Pseudo Wire emulation of ATM over Packet Switched Networks(PSN).

This MIB reports to the PW-MIB. The PW-MIB contains structures and MIB associations generic to Pseudo-Wire Virtual Circuit (VC) emulation. VC-specific MIBs (such as this) contain config and stats for specific VC types."

-- Revision history.

REVISION "200202261200Z" -- 26 February 2002 12:00:00 EST

DESCRIPTION "Initial Version"

::= { experimental 979 } -- To be assigned by IANA

-- Top-level components of this MIB

pwAtmNotifications OBJECT IDENTIFIER ::= { pwAtmMIB 0 }

pwAtmObjects OBJECT IDENTIFIER ::= { pwAtmMIB 1 }

pwAtmConformance OBJECT IDENTIFIER ::= { pwAtmMIB 2 }

-- PW VC ATM Outbound Table

pwAtmOutboundTable OBJECT-TYPE

SYNTAX SEQUENCE OF PwAtmOutboundEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies the information for an ATM VC to be carried over PSN in the outbound direction."

::= { pwAtmObjects 1 }

pwAtmOutboundEntry OBJECT-TYPE

SYNTAX PwAtmOutboundEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row in this table represents an ATM VC that needs to be adapted and carried over PSN. This table is indexed by pwVcIndex from pwVcTable."

INDEX { pwVcIndex }

::= { pwAtmOutboundTable 1 }

PwAtmOutboundEntry ::= SEQUENCE {

pwAtmOutboundAtmIf	InterfaceIndex,
pwAtmOutboundVpi	AtmVpIdentifier,
pwAtmOutboundVci	AtmVcIdentifier,
pwAtmOutboundTrafficParamDescr	RowPointer,

pwAtmOutboundRowStatus	RowStatus,
pwAtmOutboundClpQosMapping	TruthValue,


```
    pwAtmOutboundOamCellSupported      TruthValue,
    pwAtmOutboundOverhead               Integer32
}
```

pwAtmOutboundAtmIf OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The ATM Interface that receives cells from the ATM network."

::= { pwAtmOutboundEntry 1 }

pwAtmOutboundVpi OBJECT-TYPE

SYNTAX AtmVpIdentifier

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"VPI value of this ATM VC.

If the pwVcType is atmTransparent then the value will be set to zero."

::= { pwAtmOutboundEntry 2 }

pwAtmOutboundVci OBJECT-TYPE

SYNTAX AtmVcIdentifier

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"VCI value of this ATM VC.

If the pwVcType is atmTransparent or atmVpcCell then the value will be set to zero."

::= { pwAtmOutboundEntry 3 }

pwAtmOutboundTrafficParamDescr OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object represents a pointer to a ATM traffic parameter specification table which will be employed while receiving cells from the ATM network. This table should contain a set of self-consistent ATM traffic parameters including the ATM traffic service category. A value of 0.0 indicates Best Effort"

::= { pwAtmOutboundEntry 4 }

pwAtmOutboundRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This Object is used to create, modify or delete a row in this

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```
        table."  
 ::= { pwAtmOutboundEntry 5 }
```

```
pwAtmOutboundClpQosMapping OBJECT-TYPE
```

```
SYNTAX      TruthValue
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "This Object indicates whether the CLP bits are considered when  
    determining the value placed in the Quality of Service fields  
    (e.g. EXP fields of the MPLS Label Stack) of the encapsulating  
    protocol."
```

```
 ::= { pwAtmOutboundEntry 6 }
```

```
pwAtmOutboundOamCellSupported OBJECT-TYPE
```

```
SYNTAX      TruthValue
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "This Object indicates whether OAM Cells are transported on this  
    VC."
```

```
 ::= { pwAtmOutboundEntry 7 }
```

```
pwAtmOutboundOverhead OBJECT-TYPE
```

```
SYNTAX      Integer32 (0..20)
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "This Object represents the ATM overhead (% value) to be  
    applied when calculating QoS rates in the  
    MPLS domain for atmAal5Vcc transport. This object will be  
    set to zero in the cell transport mode as the  
    bandwidth needed to carry cells in the MPLS domain will be  
    higher (since Tunnel label, VC label and an  
    optional control word has to be transmitted with every cell)".
```

```
    DEFVAL { 15 }
```

```
 ::= { pwAtmOutboundEntry 8 }
```

```
-- End of PW VC ATM Outbound Table
```

```
-- PW VC ATM Outbound Perf Table
```

```
pwAtmOutboundPerfTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF PwAtmOutboundPerfEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

"This table specifies performance-related attributes for
an ATM VC in the outbound direction."
::= { pwAtmObjects 2 }

pwAtmOutboundPerfEntry OBJECT-TYPE

SYNTAX PwAtmOutboundPerfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row in this table represents performance for an ATM VC in the
outbound direction"

AUGMENTS { pwAtmOutboundEntry }

::= { pwAtmOutboundPerfTable 1 }

PwAtmOutboundPerfEntry ::= SEQUENCE {

pwAtmOutboundCellsReceived Counter32,

pwAtmOutboundCellsRejected Counter32,

pwAtmOutboundCellsTagged Counter32,

pwAtmOutboundHCCellsReceived Counter64,

pwAtmOutboundHCCellsRejected Counter64,

pwAtmOutboundHCCellsTagged Counter64

}

pwAtmOutboundCellsReceived OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This Object indicates the number of cells received by this VC."

::= { pwAtmOutboundPerfEntry 1 }

pwAtmOutboundCellsRejected OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This Object indicates the number of cells that were rejected by
this VC because of policing."

::= { pwAtmOutboundPerfEntry 2 }

pwAtmOutboundCellsTagged OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This Object indicates the number of cells that were Tagged."

::= { pwAtmOutboundPerfEntry 3 }

pwAtmOutboundHCCellsReceived OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	

"High capacity counter for number of cells received by this VC."
::= { pwAtmOutboundPerfEntry 4 }

pwAtmOutboundHCCellsRejected OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"High Capacity counter for number of cells that were rejected by
this VC because of policing."

::= { pwAtmOutboundPerfEntry 5 }

pwAtmOutboundHCCellsTagged OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"High capacity counter for number of cells that were Tagged."

::= { pwAtmOutboundPerfEntry 6 }

-- End of PW VC ATM Outbound Perf Table

-- PW VC ATM Inbound Table

pwAtmInboundTable OBJECT-TYPE

SYNTAX SEQUENCE OF PwAtmInboundEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies the information for an ATM VC in the
Inbound direction."

::= { pwAtmObjects 3 }

pwAtmInboundEntry OBJECT-TYPE

SYNTAX PwAtmInboundEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row in this table represents an ATM VC that needs to be sent
into the ATM Network after reconstructing cells from Packets
received from a PSN This table is indexed by pwVcIndex from
pwVcTable"

INDEX { pwVcIndex }

::= { pwAtmInboundTable 1 }

PwAtmInboundEntry ::= SEQUENCE {

pwAtmInboundAtmIf	InterfaceIndex,
pwAtmInboundVpi	AtmVpIdentifier,

pwAtmInboundVci AtmVcIdentifier,
pwAtmInboundTrafficParamDescr RowPointer,


```
    pwAtmInboundRowStatus      RowStatus,
    pwAtmInboundOamCellSupported TruthValue
}
```

pwAtmInboundAtmIf OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The ATM Interface that sends cells into the ATM network after reconstructing cells from packets received from a PSN."

::= { pwAtmInboundEntry 1 }

pwAtmInboundVpi OBJECT-TYPE

SYNTAX AtmVpIdentifier

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"VPI value of this ATM VC.

If the pwVcType is atmTransparent then the value will be set to zero."

::= { pwAtmInboundEntry 2 }

pwAtmInboundVci OBJECT-TYPE

SYNTAX AtmVcIdentifier

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"VCI value of this ATM VC.

If the pwVcType is atmTransparent or atmVpcCell then the value will be set to zero."

::= { pwAtmInboundEntry 3 }

pwAtmInboundTrafficParamDescr OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object represents a pointer to a ATM traffic parameter specification table which will be employed while transmit into the ATM network. This table contains a set of self-consistent ATM traffic parameters including the ATM traffic service category. A value of 0.0 indicates Best Effort"

::= { pwAtmInboundEntry 4 }

pwAtmInboundRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS	read-create
STATUS	current
DESCRIPTION	

"This Object is used to create, modify or delete a row in this table."

::= { pwAtmInboundEntry 5 }

pwAtmInboundOamCellSupported OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This Object indicates whether this VC can receive OAM Cells."

::= { pwAtmInboundEntry 6 }

-- End of PW VC ATM Inbound Table

-- PW VC ATM Inbound Perf Table

pwAtmInboundPerfTable OBJECT-TYPE

SYNTAX SEQUENCE OF PwAtmInboundPerfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies the performance for an ATM VC in the Inbound direction."

::= { pwAtmObjects 4 }

pwAtmInboundPerfEntry OBJECT-TYPE

SYNTAX PwAtmInboundPerfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies performance-related attributes for an ATM VC in the inbound direction."

AUGMENTS { pwAtmInboundEntry }

::= {pwAtmInboundPerfTable 1}

PwAtmInboundPerfEntry ::= SEQUENCE {

pwAtmInboundPerfCellsXmit Counter32,

pwAtmInboundPerfCellsLost Counter32,

pwAtmInboundPerfHCCellsXmit Counter64,

pwAtmInboundPerfHCCellsLost Counter64

}

pwAtmInboundPerfCellsXmit OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This Object indicates the number of cells that were transmitted

```
into ATM network by this VC."  
::= { pwAtmInboundPerfEntry 1 }
```

pwAtmInboundPerfCellsLost OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This Object indicates the number of cells that were dropped by
this VC."

::= { pwAtmInboundPerfEntry 2 }

pwAtmInboundPerfHCCellsXmit OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"High Capacity counter for the number of cells that were
transmitted into ATM network by this VC."

::= { pwAtmInboundPerfEntry 3 }

pwAtmInboundPerfHCCellsLost OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"High Capacity counter for number of cells that were dropped by
this VC."

::= { pwAtmInboundPerfEntry 4 }

-- End of PW VC ATM Inbound Table

-- conformance information

pwAtmGroups OBJECT IDENTIFIER ::= { pwAtmConformance 1 }

pwAtmCompliances OBJECT IDENTIFIER ::= { pwAtmConformance 2 }

pwAtmModuleCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for agent that support PW
ATM."

MODULE -- this module

MANDATORY-GROUPS { pwAtmOutboundGroup,
pwAtmOutboundPerfGroup,
pwAtmInboundGroup,
pwAtmInboundPerfGroup
}

::= { pwAtmCompliances 1 }

-- Units of conformance.

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```
pwAtmOutboundGroup OBJECT-GROUP
  OBJECTS { pwAtmOutboundAtmIf,
             pwAtmOutboundVpi,
             pwAtmOutboundVci,
             pwAtmOutboundTrafficParamDescr,
             pwAtmOutboundRowStatus,
             pwAtmOutboundClpQosMapping,
             pwAtmOutboundOamCellSupported,
             pwAtmOutboundOverhead
          }
  STATUS current
  DESCRIPTION
    "Collection of objects for basic ATM PW outbound config."
  ::= { pwAtmGroups 1 }

pwAtmOutboundPerfGroup OBJECT-GROUP
  OBJECTS { pwAtmOutboundCellsReceived,
             pwAtmOutboundCellsRejected,
             pwAtmOutboundCellsTagged,
             pwAtmOutboundHCCellsReceived,
             pwAtmOutboundHCCellsRejected,
             pwAtmOutboundHCCellsTagged
          }
  STATUS current
  DESCRIPTION
    "Collection of objects counting various outbound ATM PW statistics."
  ::= { pwAtmGroups 2 }

pwAtmInboundGroup OBJECT-GROUP
  OBJECTS { pwAtmInboundAtmIf,
             pwAtmInboundVpi,
             pwAtmInboundVci,
             pwAtmInboundTrafficParamDescr,
             pwAtmInboundRowStatus,
             pwAtmInboundOamCellSupported
          }
  STATUS current
  DESCRIPTION
    "Collection of objects for basic ATM PW inbound config."
  ::= { pwAtmGroups 3 }

pwAtmInboundPerfGroup OBJECT-GROUP
  OBJECTS { pwAtmInboundPerfCellsXmit,
             pwAtmInboundPerfCellsLost,
             pwAtmInboundPerfHCCellsXmit,
             pwAtmInboundPerfHCCellsLost
          }
```

}
STATUS current
DESCRIPTION

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```
"Collection of objects counting various inbound ATM PW statistics."  
 ::= { pwAtmGroups 4 }
```

END

9.0 Security Considerations

There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

No managed objects in this MIB contain sensitive information.

SNMPv1 by itself is not a secure environment. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [[RFC2574](#)] and the View-based Access Control Model [RFC 2575](#) [[RFC2575](#)] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

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