

**Remote Network Monitoring MIB Extensions for ATM Networks**  
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## **1. Introduction**

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 used for managing remote monitoring probes, specifically for ATM networks.

### **1.1. The SNMP Network Management Framework**

The SNMP Network Management Framework presently consists of three major components. They are:

the SMI, described in [RFC 1902](#) [1] - the mechanisms used for describing and naming objects for the purpose of management.

the MIB-II, STD 17, [RFC 1213](#) [2] - the core set of managed objects for the Internet suite of protocols.

the protocol, [RFC 1157](#) [3] and/or [RFC 1905](#) [4], - the protocol for accessing managed objects.

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

### **1.2. 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 refer to the object type.



## **2. Overview**

This document addresses issues related to applying 'RMON technology' to ATM Networks:

- functional applicability of existing RMON groups
- new functionality for ATM networks
- collection source design issues
- flexible resource allocation
- data reduction mechanisms
- standardization track issues

RMON-based applications can provide system administrators with valuable data about network utilization and behavior. RMON agents offer applications developers resource-intensive functions such as high-level statistics gathering and low-level filtering/capture of MAC frames.

RMON is traditionally deployed as one or more NMS applications managing multiple RMON probes, each of which is monitoring one or more network segments. RMON for ATM networks will require a different deployment model, as well as many other new MIB features.

### **2.1. RMON Resource Sharing Model**

There are some design features that are used throughout all the RMON MIBs. The most important is the RMON resource-sharing model. RMON agents are expected to create certain 'common' data-collection resources (ownerString starts with the string "monitor"). Only system administrators should be allowed to delete or modify these 'monitor-owned' resources.

NMS applications can create short-lived control entries (ownerString set to unique NMS-ID) if the monitor-owned collections are not appropriate for a given task. Some features, such as topN reporting, event-reporting, history collection (other than 30 sec/30 min intervals), and filter/capture, require NMS configuration in most implementations.

The resource owner (NMS) is expected to pick a unique value for the owner string and supply this value in the first setRequest PDU creating



the control row. An NMS must check the rowStatus object (i.e. errorStatus of PDU setting status to createAnd\* before using the resource, to make sure another NMS was not allocated the resource instead. Before terminating, the NMS application must delete any control entries that it created. There is no control-row garbage collection defined in RMON, so an NMS application must check for its own stale control entries before creating new ones, upon startup.

An NMS application may optionally use another applications' resources in a read-only manner, if applicable. Usually, this is only done when a resource request is refused. The system administrator is responsible for deleting RMON resources (monitor or NMS-owned) to make room for new applications.

## **2.2. Relationship to Existing MIBs**

There are several RFCs (and I-Ds) which specify RMON MIBs and agent specifications:

### **2.2.1. RMON**

The Remote Network Monitoring MIB (RMON or RMON-1) ([RFC1757](#)) [[5](#)] provides several management functions that may be directly or indirectly applicable to ATM Networks:

- detailed link layer statistics for ethernet segments (etherStats group)
- remote polling of detailed link layer statistics for ethernet segments (history, etherHistory groups)
- basic statistics--per host and per conversation--for all valid MAC addresses discovered on each monitored segment (host and matrix groups)
- TopN Report statistics (topN talkers or errors)--per-host--for each valid MAC address discovered on each monitored segment (hostTopN group) bit-level frame filtering and frame-slice capture (filter, channel, capture groups)
- simple threshold monitoring, event-logging, and event-notification for any MIB instance





### **2.2.2. TR-RMON**

The Token Ring Extensions for RMON MIB ([RFC1513](#)) (TR-RMON) [6] provides the same kind of detailed link layer statistics and remote polling as found in RMON-1 (tokenRingMLStats/History, tokenRingPStats/History). The TR-RMON MIB is highly integrated with RMON-1, which is possible because both link layers use the same address format. An RMON MIB for ATM could be structured and positioned like the TR-MIB, but none of the shared tables can be directly applied to ATM. Since RMON-1 will be augmented and updated by RMON-2, any ATM-RMON standardization effort within the IETF should align with the RMON-2 MIB, but maintain the same 'extensions MIB' structure as found in the TR-RMON MIB.

### **2.2.3. RMON-2 MIB**

The emerging 'RMON-2' standard (RMON-2) [7] provides many additions and improvements to RMON-1:

- complete protocol distribution per segment (or 'collection source')
- collection of network to MAC address bindings seen in packets on all segments
- collection of source MAC address to physical interface bindings on all segments
- probe configuration, such as startup parameters and trap destination management
- collection of per network-layer host basic statistics (network layer and above)
- collection of per-conversation basic statistics (network layer and above)
- TopN Report statistics per conversation (network layer and above)
- improvements such as relative-offset frame filtering, user-defined remote-polling, faster table retrieval, and better accuracy reporting.

Although the protocol analysis features are not directly applicable, there are many design improvements in RMON-2 that can be integrated into ATM-RMON:



- TimeFilter indexing (see section on post-collection data reduction for details)
- TopN report improvements such as auto-restart, report count, and 'last-create-time' to detect discontinuities
- Control entry inserts and deletes counters (this replaces the RMON-1 'table-size' object)
- ProtocolDirectory collection-control design (i.e. central configuration defines what data is collected in each functional group)

#### **2.2.4. RMON-2 Protocol Identifiers**

The RMON Protocol Identifiers Specification (RMONPROT) [8] defines encoding rules for protocolDirID, protocolDirParameters, and protocolDirType MIB objects. It is required only if RMON-2 packet analysis is applied to frames monitored (on circuits which use frames). It is not directly applicable to the ATM-RMON MIB, and not discussed in this document.

#### **2.2.5. ATOM MIB**

The Atom MIB is the fundamental MIB for managing ATM networks (RFC 1695) [9], but it is not directly referenced by this MIB, except for use of the 'IfIndex' textual convention. It is possible other textual conventions will be imported as well (TBD).

#### **2.2.6. ATOM Supplemental MIB**

The Atom Supplemental MIB [10] defines additional management capabilities for ATM networks. The 'AtmAddr' textual convention is imported from this MIB, but no other relationship exists at this time.

### **2.3. ATM-RMON Functional Requirements**

Applying RMON to ATM networks will require some new design changes and new functionality. Special problems such as high speeds, "cells vs. frames" issues, and the connection-oriented nature of ATM need special MIB solutions in order to implement RMON for ATM networks.

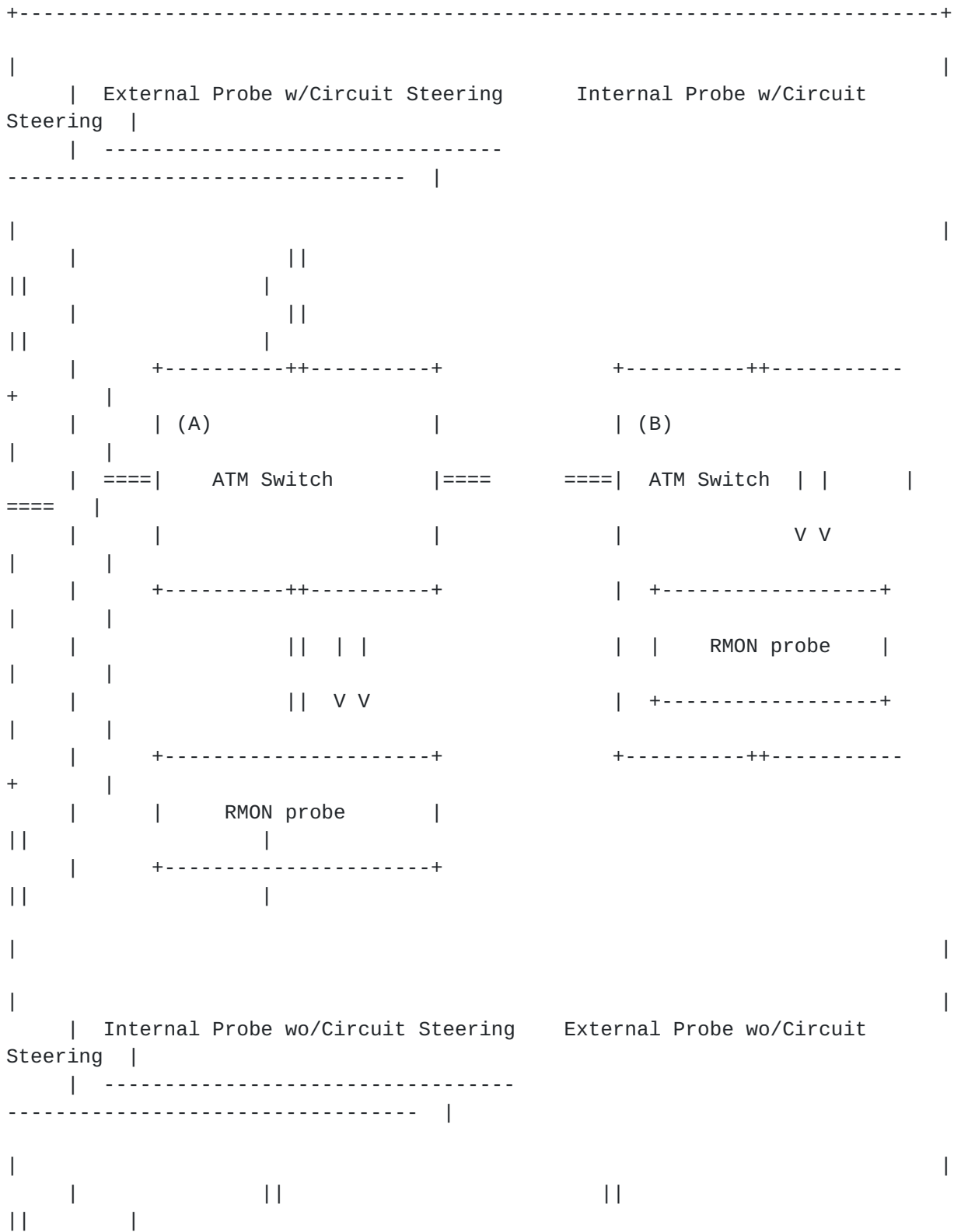


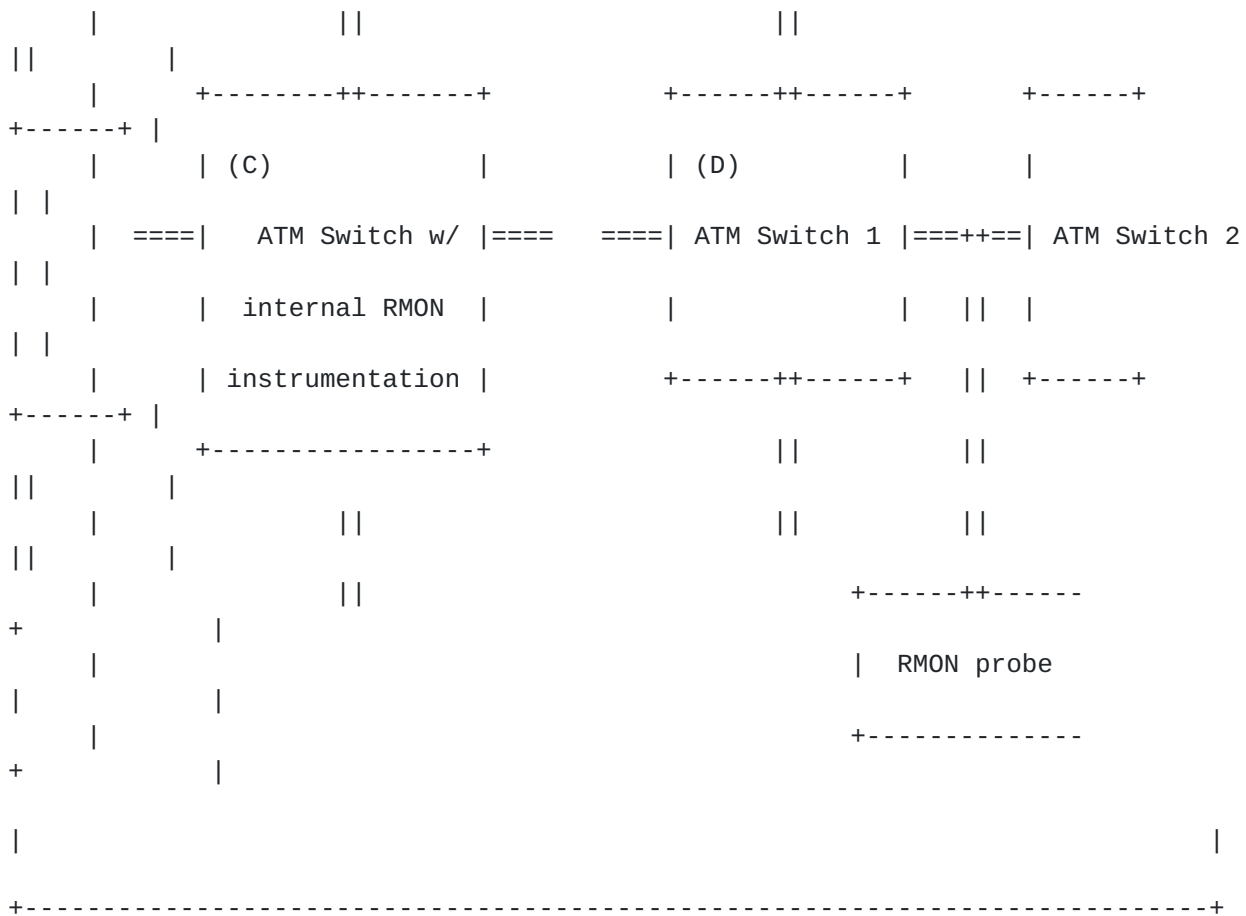
### **2.3.1. Collection Perspective**

There are four different 'collection perspectives' that should be accommodated:

- (A) stand-alone probe attached to a single port of a switch. ATM traffic is copied somehow to the RMON probe.
- (B) embedded probe within a switch., with no access to the switch fabric. ATM traffic is copied somehow to the RMON probe.
- (C) embedded probe within a switch, with access to the switch fabric. ATM traffic is monitored directly, probably implemented in hardware. Probes of this type are likely to monitor traffic at cell header level only. A lower level of conformance, or some other mechanism (e.g. additional software), will most likely be needed for this type of probe.
- (D) stand-alone probe, tapping an NNI link between two switches. ATM traffic is monitored directly (subject to probe capabilities), without switch intervention. All cells in both directions are copied somehow to the RMON probe.

Figure 1: Probe Location





Unless RMON instrumentation is embedded into the switch fabric (C), or placed between two switches (D), then circuit steering is required (A and B) for RMON instrumentation software to access ATM traffic. For such probes, each full-duplex circuit is (presumably) mapped into two redirected half-duplex circuits:

- inbound(ifIndex/VPI/VCI)
- outbound(ifIndex/VPI/VCI)

A 'probe-tap' (D) does not pre-filter data by selecting particular circuits for monitoring. Instead, it receives all VCs on an NNI link, without switch participation.

### **2.3.2. Cell Collection Requirements**

The ATM-RMON MIB will provide the following new functionality:

- ATM layer instrumentation
- complex collection source aggregation
- data reduction configuration and status
- basic cell statistics (i.e. statsTable)
- basic cell statistics per host (i.e. hostTable)
- basic cell counts per conversation (i.e. matrixTable)

Circuit Steering requirements are not addressed in this document. RMON collection requirements will be considered independently of circuit steering techniques. Although references to 'copied' circuits are made in this document, actual circuit-steering implementation may be different.

At this time, only some very basic statistics are defined:

- point-to-point cell count
- point-to-multipoint cell count
- number of point-to-point calls
- number of point-to-multipoint calls
- total point-to-point connection time
- total point-to-multipoint connection time





Other statistics (e.g. error counters) may be added in the future.

### **2.3.3. Frame Collection Requirements**

An optional feature set for ATM-RMON is the analysis of frames on AAL-5 circuits. This can be accomplished with some minor additions to the RMON-1 or RMON-2 MIBs. New values for dataSource objects can be defined which reference ATM collection sources (see MIB proposal below). The data can be formatted into RMON-1 host, matrix, hostTopN, and filter/capture groups with virtually no MIB changes. By adding encapsulation definitions to the RMON-2 protocolDirectory, RMON-2 host, matrix, matrixTopN, and filter2 groups can be implemented for ATM network traffic.

[TBD: Details on frame analysis integration w/RMON-1 and RMON-2 MIBs.]

### **2.4. ATM-RMON Design Goals**

The RMON Working Group within the Internet Engineering Task Force (IETF) will be updating and augmenting the RMON MIB soon, and several of these changes can be incorporated into an ATM-RMON MIB. The main advantages to 'borrowing' from the existing RMON MIB:

- allow system administrators to reuse operational experience with RMON concepts and RMON data presentation (e.g. basic/host/matrix stats for a given media or protocol).
- allow portions of standard MIBs to be applied directly to ATM-RMON without modification.
- allow RMON NMS and probe vendors to possibly take advantage of their RMON-1 implementation experience.
- allow flexible configuration with low complexity.

ATM-RMON will require new configuration mechanisms to deal with varying application needs and probe capabilities. RMON-1 defines a 'dataSource' object of type OBJECT IDENTIFIER, which allows new or proprietary mechanisms beyond the 'ifIndex' object. RMON-2 provides for extension of allowable dataSource values. (The 'ifIndex.N' and 'rpPtrGroupPortIndex.N.M' formats are the only collection sources supported by the RMON WG at this time, but vendors are free to define unofficial values.) New MIB tables to specify collection parameters for



ATM will be required. The dataSource object can be used to reference a circuit-selection control entry instead of an instance of ifIndex.

The ability to select circuits for monitoring is important for the conservation of agent resources. An NMS must be able to specify an arbitrary number of circuits (subject to agent capabilities), in combination with circuits that are selected by the ATM address(es). This requires:

- a mechanism to include or exclude connections by {ifIndex/VPI/VCI} tuples -- intended for PVC capture
- a mechanism to include or exclude all connections for a given ATM address or masked address -- intended for SVC capture
- a mechanism to 'glue' all the selection logic together

#### **2.4.1. Data Reduction**

Traditionally, RMON host and matrix tables can be very large, and take a great deal of resources to manage by the NMS and maintain by the agent. The high speeds and complex collection requirements make it very desirable to reduce both the agent and NMS load for processing RMON data.

Generally, agent resources can be saved with pre-collection data reduction, and NMS resources can be saved with post-collection data reduction. Both types are integrated into ATM-RMON.

##### **2.4.1.1. Pre-collection Data Reduction**

The most effective way to save probe resources is to limit what data is ever processed in any manner by the probe:

- sampling of frames to allow a probe to decode a subset of all possible frames on a given collection source.
- need to disallow sampling on some circuits.
- sampling configuration -- need balance between NMS and agent configuration
- need sampling accuracy reporting



- need powerful, yet easy-to-configure circuit selection to direct probe resources most efficiently

Resources can be optimized (in an implementation-specific manner) by statistical sampling of all cells within a given cell flow. Sampling may also apply to circuit selection on one or more ports within a given switch.

Sampling can be useful for frame analysis, and accomplished (in an implementation-specific manner) by capturing all the consecutive cells which comprise a particular frame.

#### **2.4.1.2. Post-collection Data Reduction**

Even with pre-collection data reduction it is likely ATM-RMON data tables will grow quite large, so it is also desirable to minimize the number of SNMP transactions required to retrieve or refresh these data tables. The mechanisms included in this MIB are:

- Time Filter indexing -- allows an NMS to retrieve only the changed values since its last polling interval.
- selection aggregation -- address-masking capability of the circuit selection feature allows an NMS to reduce the number of actual counters maintained by the probe.
- TopN Report aggregation -- probe continuously monitors the top talkers over a given interval, and automatically generates a report at the end of each interval.

#### **2.4.2. Collection Source Issues**

The current RMON 'dataSource' model is not particularly useful for ATM networks, since ATM is connection-oriented, and is not used in this MIB. Instead, a set of global tables are used to define 'circuit selection groups' (called 'vcSelectGroups'). Traditional RMON collections (e.g. stats, host, hostTopN, matrix) can be done using a vcSelectGroup as the dataSource. Some issues regarding the design of the ATM-RMON 'dataSource model' include:

- collection criteria must be detailed -- combined criteria with include/exclude , masking



- collection criteria setup cannot be modified on the fly for a particular vcSelectGroup, while any collections based on that vcSelectGroup are in progress. However, vcSelectGroups can be added and deleted while collections based on existed vcSelectGroups are in progress.
- selection MIB table setup rules TBD (i.e. overall logic is combinatorial, but some precedence rules and corner cases must be documented).



### **3. MIB Proposal**

The following MIB proposal is based, in part, on the RMON-2 MIB. The open issues list:

- no error counter instrumentation yet
- no matrix TopN functionality yet
- no notifications/traps defined yet
- still needs to be syntax-checked and MIB-linted

some details on configuration, rollover time issues, 64-bit counter SMI issues, and frame/cells/both selection are still TBD

RMON-1 and RMON-2 integration is achieved by setting the particular dataSource object to reference an instance of the 'vcSelectGroupIndex' object, but details are not discussed in this MIB.

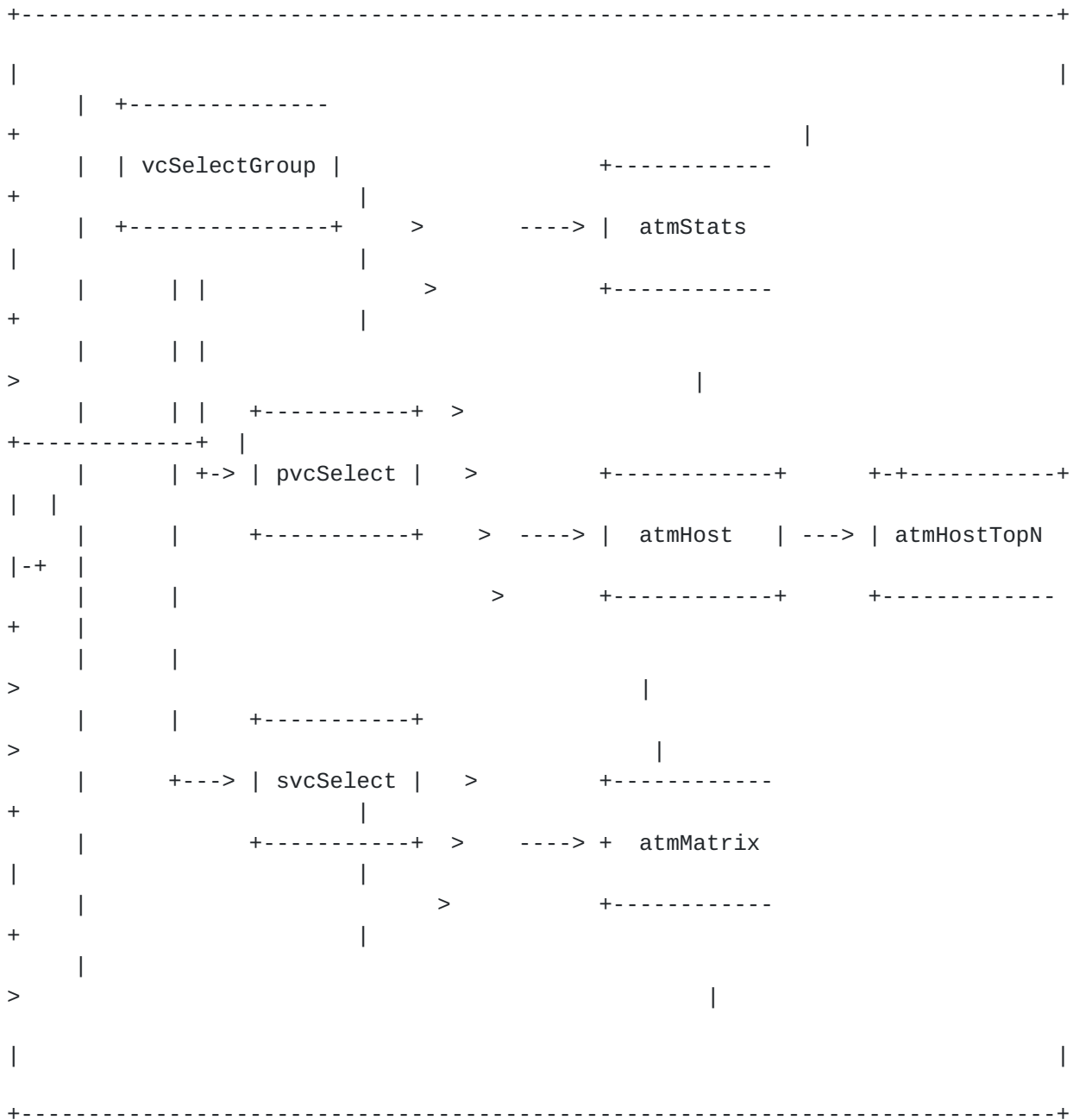
#### **3.1. MIB Structure**

The MIB contains four groups:

- vcSelect -- circuit selection; data tables indexed by a common index 'vcSelectGroupIndex', which replaces the dataSource indirect pointer and arbitrary small integer index used in RMON-1/RMON-2
- atmStats -- basic statistics; allows individual host traffic contribution percentage to be easily calculated.
- atmHost -- ATM host statistics and hostTopN reporting
- atmMatrix -- ATM circuit statistics



Figure 2: ATM-RMON MIB Structure



The vcSelectGroup is used to define the VCCs to be monitored for a particular set of functions (a subset of all ATM-RMON, RMON-1, and RMON-2 groups). Each vcSelectGroup is used as a collection source for zero or one atmStats, atmHost, and atmMatrix collections. There may be an arbitrary number of atmHostTopN entries defined per vcSelectGroup.

For processing of frames collected (in an implementation-specific way)

from the vcSelectGroup, the appropriate RMON-1 or RMON-2 dataSource instance is set to the OBJECT IDENTIFIER 'vcSelectGroupIndex.I'. [TBD: Row creation, modification, and deletion problems related to table dependencies between ATM-RMON and the other RMON MIBs.

For processing of packets collected on behalf the RMON-2 MIB, the proper protocol identifiers must be set up before the nlHost, alHost, nlMatrix, alMatrix, and filter2 groups can be utilized. [TBD ATM encapsulation macro identifier additions to [\[8\]](#).]

#### **4. Definitions**

```
ATM-RMON-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, Counter32,  
    Integer32, Gauge32, IpAddress,  
    TimeTicks, Counter64, experimental  
        FROM SNMPv2-SMI  
    TEXTUAL-CONVENTION, RowStatus, DisplayString,  
    TimeStamp, TruthValue  
        FROM SNMPv2-TC  
    MODULE-COMPLIANCE, OBJECT-GROUP  
        FROM SNMPv2-CONF  
    OwnerString  
        FROM RFC1757-MIB  
    ZeroBasedCounter32, LastCreateTime, TimeFilter  
        FROM RMON2-MIB  
    IfIndex  
        FROM ATM-MIB  
    AtmAddr  
        FROM ATM2-MIB;
```

```
-- Remote Network Monitoring MIB for ATM Networks
```

```
atmRmon MODULE-IDENTITY
```

```
    LAST-UPDATED "9602210000Z"  
    ORGANIZATION "IETF"  
    CONTACT-INFO  
        "Andy Bierman  
        Bierman Consulting  
        Phone: +1 805 648 2028  
        Email: abierman@west.net
```

```
        Keith McCloghrie  
        Cisco Systems, Inc.  
        Phone: +1 408 526-5260  
        Email: kzm@cisco.com"
```

```
DESCRIPTION
```

```
    "The MIB module for managing remote monitoring device  
    implementations for ATM networks."
```

```
::= { experimental xx }
```

```
vcSelect      OBJECT IDENTIFIER ::= { atmRmon 1 }  
atmStats      OBJECT IDENTIFIER ::= { atmRmon 2 }
```



atmHost            OBJECT IDENTIFIER ::= { atmRmon 3 }  
atmMatrix         OBJECT IDENTIFIER ::= { atmRmon 4 }  
  
atmRmonConformance OBJECT IDENTIFIER ::= { atmRmon 5 }

-- Textual Conventions:

QoSIndex ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This TC describes an object that identifies the cell delivery quality-of-service classification, associated with a particular vcSelectGroup collection."

SYNTAX INTEGER {

unknownQos(1), -- includes 'other'; [need separate enum?]

cbrQos(2), -- constant bit rate

rtVbrQos(3), -- variable bit rate (real-time)

nrtVbrQos(4), -- variable bit-rate (non-real-time)

abrQos(5), -- available bit rate

ubrQos(6) -- unspecified bit rate

}

ResourcePriority ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This TC describes an object which indicates the resource priority of the entire entry. Lower priorities indicate a lesser requirement to retain resources than higher priority values. A probe is strongly encouraged, but not required, to honor all priority requests, all of the time.

Objects declared with this TC should be contained within a conceptual control table entry. The indicated resource priority applies to the control entry and all internal data structures maintained on behalf of the control entry.

A probe is expected to honor the priority requests in an implementation-dependent way. At this time, it is unspecified as to the priority ordering of entries with the same ResourcePriority value."

SYNTAX INTEGER {

lowPriority(1),

normalPriority(2),

highPriority(3)

}

ZeroBasedCounter64 ::= TEXTUAL-CONVENTION

STATUS current





## DESCRIPTION

"This TC describes an object which counts events with the following semantics: objects of this type will be set to zero(0) on creation and will thereafter count appropriate events, wrapping back to zero(0) when the value  $2^{64}$  is reached.

Provided that an application discovers the new object within the minimum time to wrap it can use the initial value as a delta since it last polled the table of which this object is part. It is important for a management station to be aware

of this minimum time and the actual time between polls, and to discard data if the actual time is too long or there is no defined minimum time.

Typically this TC is used in tables where the INDEX space is constantly changing and/or the TimeFilter mechanism is in use."

- THIS IS BROKEN AND NEEDS TO BE CHANGED ASAP!
  - For SNMPv2, a new type Unsigned64 is needed
  - don't know what to do for SNMPv1 yet
  - choices are OCTET STRING (SIZE(8)) using 2
  - ZeroBasedCounter32 objects instead
- SYNTAX Counter64



```
--  
-- Virtual Circuit Selection group (vcSelect)  
--  
-- Defines the circuits to be included or excluded in  
-- a particular host or matrix collection  
--   vcSelectGroupTable  
--   pvcSelectTable  
--   svcSelectTable
```

vcSelectGroupTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF VcSelectGroupEntry  
MAX-ACCESS  not-accessible  
STATUS      current
```

DESCRIPTION

"Controls the setup of virtual circuit selection criteria used on behalf of any collection associated with entries in this table (e.g. atmHostTable).

This table allows pvcSelect and svcSelect entries with the same value of vcSelectGroupIndex to be grouped together to form selection criteria logical-OR expressions.

Rules for combining and prioritizing the order of pvcSelect and svcSelect entries:

Each pvcSelect or svcSelect entry is grouped together by its major index (vcSelectGroupIndex), and is evaluated in the order of its minor index (pvcSelectIndex or svcSelectIndex).

Each successive pvcEntry defines a PVC to be included or excluded from the vcSelectGroup. These are evaluated, in ascending order of pvcSelectIndex, to determine the PVC select criteria for this vcSelectGroup. Higher-indexed entries have precedence when resolving conflicts. [TBD: More detail, Error checking and reporting]

Each successive svcEntry defines a group of SVCs to be included or excluded from the vcSelectGroup, by masked ATM address. This mask identifies ATM addresses (calling or called party) that are using one or more SVCs identified by the probe (in an implementation-specific manner).

Each entry is evaluated, in ascending order of



svcSelectIndex, to determine the SVC select criteria for this vcSelectGroup. Higher-indexed entries have precedence when resolving conflicts. [TBD: More detail on conflicts, error checking, and error reporting]

Rationale: This table controls selection of the circuits to be monitored on behalf of one or more collections (e.g. host or matrix) performed by this probe."

```
::= { vcSelect 1 }
```

#### vcSelectGroupEntry OBJECT-TYPE

SYNTAX VcSelectGroupEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"A conceptual row in the vcSelectGroupTable.

An example of the indexing of this entry is  
vcSelectGroupCreateTime.7"

INDEX { vcSelectGroupIndex }

```
::= { vcSelectGroupTable 1 }
```

#### VcSelectGroupEntry ::= SEQUENCE {

vcSelectGroupIndex	Integer32,
vcSelectGroupDescr	DisplayString,
vcSelectGroupCreateTime	LastCreateTime,
vcSelectGroupOwner	OwnerString,
vcSelectGroupStatus	RowStatus

```
}
```

#### vcSelectGroupIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"A unique index for this vcSelectGroupEntry."

```
::= { vcSelectGroupEntry 1 }
```

#### vcSelectGroupDescr OBJECT-TYPE

SYNTAX DisplayString (SIZE(0..64))

MAX-ACCESS read-create

STATUS current

#### DESCRIPTION

"An administratively-assigned descriptive label for this vcSelectGroup entry."



```
::= { vcSelectGroupEntry 2 }
```

```
vcSelectGroupCreateTime OBJECT-TYPE
```

```
SYNTAX      LastCreateTime
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The value of sysUpTime when this Group entry was activated.  
    This can be used by the management station to ensure that  
    the table has not been deleted and recreated between polls."
```

```
::= { vcSelectGroupEntry 3 }
```

```
vcSelectGroupOwner OBJECT-TYPE
```

```
SYNTAX      OwnerString
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The entity that configured this entry and is therefore  
    using the resources assigned to it."
```

```
::= { vcSelectGroupEntry 4 }
```

```
vcSelectGroupStatus OBJECT-TYPE
```

```
SYNTAX      RowStatus
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The status of this row.
```

```
    An entry may not exist in the active state unless all  
    objects in the entry have an appropriate value. All  
    pvcSelectEntries and svcSelectEntries with a corresponding  
    value of vcSelectGroupIndex must be in the active state  
    before this object may be set to active(1).
```

```
    If this object is not equal to active(1), all associated  
    data collections shall be deleted. That is, any associated  
    collections in the atmHostTable or atmMatrixTable.
```

```
    Note that pvcSelectEntries and svcSelectEntries are not  
    deleted when this entry leaves the active state."
```

```
::= { vcSelectGroupEntry 5 }
```





```

-- pvcSelectTable
--
-- Defines the PVCs to be included or excluded in
-- a particular data collection (e.g. host or matrix)

pvcSelectTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PvcSelectEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Controls the setup of PVC circuit selection criteria for
        the host and matrix groups.

        Rationale: This table controls selection of the virtual
        circuits to be monitored on behalf of one or more
        collections performed by this probe."
    ::= { vcSelect 2 }

pvcSelectEntry OBJECT-TYPE
    SYNTAX      PvcSelectEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A conceptual row in the pvcSelectTable.

        An example of the indexing of this entry is
        pvcSelectCreateTime.7.2"
    INDEX { vcSelectGroupIndex, pvcSelectIndex }
    ::= { pvcSelectTable 1 }

PvcSelectEntry ::= SEQUENCE {
    pvcSelectIndex      Integer32,
    pvcSelectIfIndex    IfIndex,
    pvcSelectVPI        Integer32,
    pvcSelectVCI        Integer32,
    pvcSelectInclude    TruthValue,
    pvcSelectCreateTime LastCreateTime,
    pvcSelectOwner      OwnerString,
    pvcSelectStatus     RowStatus
}

pvcSelectIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current

```



## DESCRIPTION

"A unique index for this pvcSelectEntry."  
 ::= { pvcSelectEntry 1 }

## pvcSelectIfIndex OBJECT-TYPE

SYNTAX IfIndex  
MAX-ACCESS read-create  
STATUS current

## DESCRIPTION

"The ifIndex value describing the ATM interface associated with this pvcSelectEntry.

This object may not be modified if the associated instance of pvcSelectStatus is equal to active(1)."

::= { pvcSelectEntry 2 }

## pvcSelectVPI OBJECT-TYPE

SYNTAX Integer32  
MAX-ACCESS read-create  
STATUS current

## DESCRIPTION

"The VPI value associated with this pvcSelectEntry.

[TBD: wildcarding]

This object may not be modified if the associated instance of pvcSelectStatus is equal to active(1)."

::= { pvcSelectEntry 3 }

## pvcSelectVCI OBJECT-TYPE

SYNTAX Integer32  
MAX-ACCESS read-create  
STATUS current

## DESCRIPTION

"The VCI value associated with this pvcSelectEntry.

[TBD: wildcarding]

This object may not be modified if the associated instance of pvcSelectStatus is equal to active(1)."

::= { pvcSelectEntry 4 }

## pvcSelectInclude OBJECT-TYPE

SYNTAX TruthValue  
MAX-ACCESS read-create



STATUS current  
DESCRIPTION  
"This object controls whether the indicated PVC is included or excluded in the associated vcSelectGroup.  
  
If this object has the value true(1), the circuit indicated by this entry is included in the vcSelectGroup.  
  
If it has the value false(2), the circuit indicated by this entry is excluded from the vcSelectGroup.  
  
This object may not be modified if the associated instance of pvcSelectStatus is equal to active(1)."  
 ::= { pvcSelectEntry 5 }

pvcSelectLastCreateTime OBJECT-TYPE  
SYNTAX LastCreateTime  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The value of sysUpTime when this pvcSelect entry was activated. This can be used by the management station to ensure that the table has not been deleted and recreated between polls."  
 ::= { pvcSelectEntry 6 }

pvcSelectOwner OBJECT-TYPE  
SYNTAX OwnerString  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"The entity that configured this entry and is therefore using the resources assigned to it."  
 ::= { pvcSelectEntry 7 }

pvcSelectStatus OBJECT-TYPE  
SYNTAX RowStatus  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"The status of this row.  
  
An entry may not exist in the active state unless all objects in the entry have an appropriate value.



This object may not be modified if the associated instance of vcSelectGroupStatus is equal to active(1).

If this object is not equal to active(1), all associated data collections shall be deleted. That is, any associated collections in the atmHostTable or atmMatrixTable."

```
::= { pvcSelectEntry 8 }
```

```
-- svcSelectTable
```

```
--
```

```
-- Defines the SVCs to be included or excluded in
```

```
-- a particular host or matrix collection
```

```
svcSelectTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF SvcSelectEntry
```

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

```
STATUS current
```

```
DESCRIPTION
```

"Controls the setup of SVC circuit selection criteria for the host and matrix groups.

Rules for combining multiple svcSelectEntries within the same vcSelectGroup [TBD].

[TBD -- Error conditions, conflict resolution]

Rationale: This table controls selection of the circuits to be monitored on behalf of one or more collections (either host or matrix) performed by this probe."

```
::= { vcSelect 3 }
```

```
svcSelectEntry OBJECT-TYPE
```

```
SYNTAX SvcSelectEntry
```

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

```
STATUS current
```

```
DESCRIPTION
```

"A conceptual row in the svcSelectTable.

An example of the indexing of this entry is  
svcSelectControlCreateTime.7.1"

```
INDEX { vcSelectGroupIndex, svcSelectIndex }
```

```
::= { svcSelectTable 1 }
```

```
SvcSelectEntry ::= SEQUENCE {
```





```
svcSelectIndex      Integer32,
svcSelectIfIndex    IfIndex,
svcSelectAddr       AtmAddr,
svcSelectAddrMask   AtmAddr,
svcSelectInclude     TruthValue,
svcSelectCreateTime LastCreateTime,
svcSelectOwner       OwnerString,
svcSelectStatus     RowStatus
}
```

svcSelectIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique index for this svcSelectEntry."

::= { svcSelectEntry 1 }

svcSelectIfIndex OBJECT-TYPE

SYNTAX IfIndex

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The ifIndex value describing the ATM interface associated with this svcSelectEntry. The SVCs are identified for this entry on this interface only.

This object may not be modified if the associated instance of svcSelectStatus is equal to active(1)."

::= { svcSelectEntry 2 }

svcSelectAddr OBJECT-TYPE

SYNTAX AtmAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object describes the SVCs, selected by ATM address(es), identified by this svcSelectEntry. Note that only non-zero length variants of the AtmAddr are permitted in this table.

If the associated svcSelectInclude instance is true(1), all cells transmitted on behalf of calling or called parties identified by the SVC-match-algorithm are included in the indicated vcSelectGroup.



If the associated `svcSelectInclude` instance is `false(2)`, all cells transmitted on behalf of calling or called parties identified by the SVC-match-algorithm are excluded from the indicated `vcSelectGroup`.

The associated instance of `svcSelectAddrMask` must be the same type and length as this object. Address types are determined by the length of this object, as defined in [ATM2-MIB].

SVC-match-algorithm:

```
boolean SVC-match-algorithm()
{
    for (each corresponding bit in the calling-party or
        called-party atmAddr, svcSelectAddr, and
        svcSelectAddrMask objects)
    {
        if (svcSelectAddrMask-bit)
            if (svcSelectAddr-bit ^ atmAddr-bit)
                return(FALSE);
    }
    return(TRUE);
}
```

Address-to-cell association is done in an implementation-specific manner, requiring examination of signaling information related to the SVCs described by this `svcSelectEntry`.

This object may not be modified if the associated instance of `svcSelectStatus` is equal to `active(1)`."

```
::= { svcSelectEntry 3 }
```

`svcSelectAddrMask` OBJECT-TYPE

SYNTAX AtmAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object controls the SVC-match-algorithm performed on cells identified by this `svcSelectEntry`. This object must be the same exact type and length as the associated `svcSelectAddr` object.

While executing the SVC-match-algorithm, each bit in the



svcSelectAddrMask is examined. If the value is one, then the corresponding svcSelectAddr bit must match the calling or called party address bit. If the value is zero, then no test is done for this bit position. Refer to the svcSelectAddr object description for more details on the SVC-match-algorithm.

This object may not be modified if the associated instance of svcSelectStatus is equal to active(1)."

::= { svcSelectEntry 4 }

svcSelectInclude OBJECT-TYPE

SYNTAX TruthValue  
MAX-ACCESS read-create  
STATUS current

DESCRIPTION

"This object controls whether SVCs for the indicated addresses are included or excluded in the associated vcSelectGroup.

If this object has the value true(1), then circuits indicated by this entry are included in the vcSelectionGroup.

If this object has the value false(2), then circuits indicated by this entry are excluded from the vcSelectionGroup.

This object may not be modified if the associated instance of svcSelectStatus is equal to active(1)."

::= { svcSelectEntry 5 }

svcSelectLastCreateTime OBJECT-TYPE

SYNTAX LastCreateTime  
MAX-ACCESS read-only  
STATUS current

DESCRIPTION

"The value of sysUpTime when this svcSelect entry was activated. This can be used by the management station to ensure that the table has not been deleted and recreated between polls."

::= { svcSelectEntry 6 }

svcSelectOwner OBJECT-TYPE

SYNTAX OwnerString



MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The entity that configured this entry and is therefore using the resources assigned to it."

::= { svcSelectEntry 7 }

svcSelectStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this row.

An entry may not exist in the active state unless all objects in the entry have an appropriate value.

This object may not be modified if the associated instance of vcSelectGroupStatus is equal to active(1).

If this object is not equal to active(1), all associated data collections shall be deleted. That is, any associated collections in the atmHostTable or atmMatrixTable."

::= { svcSelectEntry 8 }





```
--
-- ATM Stats Group
--
-- Counts the total amount of traffic sent on behalf all ATM addresses
-- discovered by the probe, according to associated vcSelectGroup
-- criteria
```

atmStatsControlTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF AtmStatsControlEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A list of ATM basic statistic collection table control
    entries.  These entries will enable the collection of
    statistical totals for an entire vcSelectGroup."
 ::= { atmStats 1 }
```

atmStatsControlEntry OBJECT-TYPE

```
SYNTAX      AtmStatsControlEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A conceptual row in the atmStatsControlTable.  Entries in
    this table are identified and indexed by the
    vcSelectGroupIndex object.  At most one atmStats collection
    is done per vcSelectGroup.

    An example of the indexing of this entry is
    atmStatsDroppedCells.1"
INDEX { vcSelectGroupIndex }
 ::= { atmStatsControlTable 1 }
```

```
AtmStatsControlEntry ::= SEQUENCE {
    atmStatsControlDroppedCells      Counter32,
    atmStatsControlHCDroppedCells    Counter64,
    atmStatsControlOwner              OwnerString,
    atmStatsControlStatus             RowStatus
}
```

atmStatsControlDroppedCells OBJECT-TYPE

```
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The total number of cells which were received by the probe
```



but for which the probe chose not to count in this collection for whatever reason. Most often, this event occurs when the probe is out of some resources and decides to shed load from one or more collections.

This count does not include cells that were not counted because they had errors."

::= { atmStatsControlEntry 1 }

atmStatsControlHCDroppedCells OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of cells which were received by the probe but for which the probe chose not to count in this collection for whatever reason. Most often, this event occurs when the probe is out of some resources and decides to shed load from one or more collections.

This count does not include cells that were not counted because they had errors."

::= { atmStatsControlEntry 2 }

atmStatsControlOwner OBJECT-TYPE

SYNTAX OwnerString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The entity that configured this entry and is therefore using the resources assigned to it."

::= { atmStatsControlEntry 3 }

atmStatsControlStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this atmStatsControlEntry.

An entry may not exist in the active state unless all objects in the entry have an appropriate value. Specifically, the associated instance of vcSelectGroupStatus must be equal to active(1) before this object may be set to active(1).



If this object is not equal to active(1), all associated entries in the atmStatsTable shall be deleted."  
 ::= { atmStatsControlEntry 4 }

```
-- atmStatsTable
-- call and traffic basic statistics collected on behalf of specific
-- vcSelectGroups
```

```
atmStatsTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF atmStatsEntry
```

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

```
STATUS current
```

```
DESCRIPTION
```

```
"A collection of statistical totals for all ATM host
addresses that have been discovered on behalf of the
vcSelectGroup associated with this entry."
```

```
::= { atmStats 2 }
```

```
atmStatsEntry OBJECT-TYPE
```

```
SYNTAX AtmStatsEntry
```

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

```
STATUS current
```

```
DESCRIPTION
```

```
"A conceptual row in the atmStatsTable.
```

```
The vcSelectGroupIndex value in the index identifies the
vcSelectGroup on whose behalf this entry was created.
```

```
An example of the indexing of this entry is
atmStatsP2pCells.8.28775.3"
```

```
INDEX { vcSelectGroupIndex, atmStatsTimeMark, atmStatsQoS }
```

```
::= { atmStatsTable 1 }
```

```
AtmStatsEntry ::= SEQUENCE {
```

```
atmStatsTimeMark TimeFilter,
atmStatsQoS QoSIndex,
atmStatsCreateTime LastCreateTime,
atmStatsP2pCells Counter32,
atmStatsP2mpCells Counter32,
atmStatsHCP2pCells Counter64,
atmStatsHCP2mpCells Counter64,
atmStatsNumP2pCalls Counter32,
atmStatsNumP2mpCalls Counter32,
atmStatsP2pConnectionTime TimeStamp,
atmStatsP2mpConnectionTime TimeStamp
```

```
}
```

```
atmStatsTimeMark OBJECT-TYPE
```

```
SYNTAX TimeFilter
```





MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
    "A TimeFilter for this entry. See the TimeFilter textual  
    convention in [RMON2-MIB] to see how this works."  
 ::= { atmStatsEntry 1 }

atmStatsQoS OBJECT-TYPE  
SYNTAX QoSIndex  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
    "The quality of service classification for this entry. See  
    the QoSFilter textual convention for details and specific  
    QoS values."  
 ::= { atmStatsEntry 2 }

atmStatsCreateTime OBJECT-TYPE  
SYNTAX LastCreateTime  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The value of sysUpTime when this entry was activated. This  
    can be used by the management station to ensure that the  
    entry has not been deleted and recreated between polls."  
 ::= { atmStatsEntry 3 }

atmStatsP2pCells OBJECT-TYPE  
SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The total number of error-free cells detected on point-to-  
    point circuits on behalf of this vcSelectGroup collection."  
 ::= { atmStatsEntry 4 }

atmStatsP2mpCells OBJECT-TYPE  
SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The total number of error-free cells detected on point-to-  
    multipoint circuits on behalf of this vcSelectGroup  
    collection."  
 ::= { atmStatsEntry 5 }



## atmStatsHCP2pCells OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The total number of error-free cells detected on point-to-point circuits on behalf of this vcSelectGroup collection."

::= { atmStatsEntry 6 }

## atmStatsHCP2mpCells OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The total number of error-free cells detected on point-to-multipoint circuits on behalf of this vcSelectGroup collection."

::= { atmStatsEntry 7 }

## atmStatsNumP2pCalls OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The total number of calls detected on point-to-point circuits on behalf of this vcSelectGroup collection."

::= { atmStatsEntry 8 }

## atmStatsNumP2mpCalls OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of calls detected on point-to-multipoint circuits on behalf of this vcSelectGroup collection."

::= { atmStatsEntry 9 }

## atmStatsP2pConnectionTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The elapsed time of all calls identified by the associated instance of atmStatsNumP2pCalls." -- will this roll too fast to be useful? -- to rollover in < 1 hour, approx. 12000



```
    sustained, concurrent -- have to be active.  
 ::= { atmStatsEntry 10 }
```

atmStatsP2mpConnectionTime OBJECT-TYPE

```
SYNTAX      TimeStamp  
MAX-ACCESS  read-only  
STATUS      current
```

DESCRIPTION

```
    "The elapsed time of all calls identified by the associated  
    instance of atmStatsNumP2mpCalls." -- will this roll too  
    fast to be useful? -- to rollover in < 1 hour, approx.  
    12000 sustained, concurrent -- have to be active.
```

```
 ::= { atmStatsEntry 11 }
```

```

--
-- ATM Host Group
--
-- Counts the amount of traffic sent on behalf of each ATM address
-- discovered by the probe, according to associated vcSelectGroup
-- criteria

atmHostControlTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF AtmHostControlEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A list of ATM host table control entries.

        These entries will enable the collection of ATM host
        information in the atmHostTable.

        Entries in the atmHostTable will be created on behalf of
        each entry in this table. A probe is required to support at
        most one atmHost collection per instance of an associated
        vcSelectGroup, therefore the table is indexed by the
        vcSelectGroupIndex.

        Default monitor-owned atmHostControl entries:
            [TBD] "
    ::= { atmHost 1 }

atmHostControlEntry OBJECT-TYPE
    SYNTAX      AtmHostControlEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A conceptual row in the atmHostControlTable. Entries in
        this table are identified and indexed by the
        vcSelectGroupIndex object. At most one atmHost collection
        is done per vcSelectGroup.

        An example of the indexing of this entry is
        atmHostControlInserts.1"
    INDEX { vcSelectGroupIndex }
    ::= { atmHostControlTable 1 }

AtmHostControlEntry ::= SEQUENCE {
    atmHostControlInserts      Counter32,
    atmHostControlDeletes     Counter32,

```



```

    atmHostControlMaxDesiredEntries      Integer32,
    atmHostControlPriority                ResourcePriority,
    atmHostControlDroppedCells           Counter32,
    atmHostControlHCDroppedCells         Counter64,
    atmHostControlOwner                  OwnerString,
    atmHostControlStatus                 RowStatus
}

```

atmHostControlInserts OBJECT-TYPE

```

SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"The number of times an atmHost entry has been inserted into the atmHost table. If an entry is inserted, then deleted, and then inserted, this counter will be incremented by 2.

To allow for efficient implementation strategies, agents may delay updating this object for short periods of time. For example, an implementation strategy may allow internal data structures to differ from those visible via SNMP for short periods of time. This counter may reflect the internal data structures for those short periods of time.

Note that the table size can be determined by subtracting atmHostControlDeletes from atmHostControlInserts."

```
 ::= { atmHostControlEntry 1 }
```

atmHostControlDeletes OBJECT-TYPE

```

SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"The number of times an atmHost entry has been deleted from the atmHost table (for any reason). If an entry is deleted, then inserted, and then deleted, this counter will be incremented by 2.

To allow for efficient implementation strategies, agents may delay updating this object for short periods of time. For example, an implementation strategy may allow internal data structures to differ from those visible via SNMP for short periods of time. This counter may reflect the internal data structures for those short periods of time.





Note that the table size can be determined by subtracting  
atmHostControlDeletes from atmHostControlInserts."  
 ::= { atmHostControlEntry 2 }

atmHostControlMaxDesiredEntries OBJECT-TYPE

SYNTAX Integer32  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION

"The maximum number of entries that are desired in the  
atmHostTable on behalf of this control entry. The probe will  
not create more than this number of associated entries in  
the table, but may choose to create fewer entries in this  
table for any reason including the lack of resources.

If this object is set to a value less than the current  
number of entries, enough entries are chosen in an  
implementation-dependent manner and deleted so that the  
number of entries in the table equals the value of this  
object.

If this value is set to -1, the probe may create any number  
of entries in this table. If the associated  
atmHostControlStatus object is equal to active(1), this  
object may not be modified.

This object may be used to control how resources are  
allocated on the probe for the various RMON functions."

::= { atmHostControlEntry 3 }

atmHostControlPriority OBJECT-TYPE

SYNTAX ResourcePriority  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION

"The priority this collection should be given to retain  
resources, in the event the probe must reclaim some  
resources in order to add new entries to an existing atmHost  
collection or add new collections of other types."

DEFVAL { normalPriority(2) }  
 ::= { atmHostControlEntry 4 }

atmHostControlDroppedCells OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only



STATUS current

DESCRIPTION

"The total number of cells which were received by the probe but for which the probe chose not to count in this collection for whatever reason. Most often, this event occurs when the probe is out of some resources and decides to shed load from one or more collections.

This count does not include cells that were not counted because they had errors."

::= { atmHostControlEntry 5 }

atmHostControlHCDroppedCells OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of cells which were received by the probe but for which the probe chose not to count in this collection for whatever reason. Most often, this event occurs when the probe is out of some resources and decides to shed load from one or more collections.

This count does not include cells that were not counted because they had errors."

::= { atmHostControlEntry 6 }

atmHostControlOwner OBJECT-TYPE

SYNTAX OwnerString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The entity that configured this entry and is therefore using the resources assigned to it."

::= { atmHostControlEntry 7 }

atmHostControlStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this atmHostControlEntry.

An entry may not exist in the active state unless all objects in the entry have an appropriate value.



Specifically, the associated instances of atmHostControlMaxDesiredEntries, atmHostControlPriority, and vcSelectGroupStatus must be equal to active(1) before this object may be set to active(1).

If this object is not equal to active(1), all associated entries in the atmHostTable shall be deleted."

```
::= { atmHostControlEntry 8 }
```

```
-- atmHostTable
-- call and traffic data collected on behalf of specific
-- vcSelectGroups
```

atmHostTable OBJECT-TYPE

SYNTAX SEQUENCE OF AtmHostEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A collection of statistics for a particular ATM host address that has been discovered on behalf of the vcSelectGroup associated with this entry. Note that only non-zero length variants of the AtmAddr object are collected in this table.

The probe will add to this table all addresses seen as the source or destination address in all cells identified by the associated vcSelectGroupEntry criteria."

```
::= { atmHost 2 }
```

atmHostEntry OBJECT-TYPE

SYNTAX AtmHostEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A conceptual row in the atmHostTable.

The vcSelectGroupIndex value in the index identifies the vcSelectGroup on whose behalf this entry was created.

An example of the indexing of this entry is  
atmHostInP2pCells.4.28375.20.<NSAP>.3"

```
INDEX { vcSelectGroupIndex, atmHostTimeMark,
        atmHostAddress, atmHostQoS }
```

```
::= { atmHostTable 1 }
```

AtmHostEntry ::= SEQUENCE {

atmHostTimeMark	TimeFilter,
atmHostAddress	AtmAddr,
atmHostQoS	QoSIndex,
atmHostCreateTime	LastCreateTime,
atmHostInP2pCells	ZeroBasedCounter32,
atmHostOutP2pCells	ZeroBasedCounter32,
atmHostInP2mpCells	ZeroBasedCounter32,
atmHostOutPm2pCells	ZeroBasedCounter32,





```

    atmHostInHCP2pCells      ZeroBasedCounter64,
    atmHostOutHCP2pCells     ZeroBasedCounter64,
    atmHostInHCP2mpCells     ZeroBasedCounter64,
    atmHostOutHCPm2pCells    ZeroBasedCounter64,
    atmHostInNumP2pCalls     ZeroBasedCounter32,
    atmHostOutNumP2pCalls    ZeroBasedCounter32,
    atmHostInNumP2mpCalls    ZeroBasedCounter32,
    atmHostOutNumP2mpCalls   ZeroBasedCounter32,
    atmHostP2pConnectionTime TimeStamp,
    atmHostP2mpConnectionTime TimeStamp
}

atmHostTimeMark OBJECT-TYPE
    SYNTAX      TimeFilter
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A TimeFilter for this entry.  See the TimeFilter textual
        convention in [RMON2-MIB] to see how this works."
    ::= { atmHostEntry 1 }

atmHostAddress OBJECT-TYPE
    SYNTAX      AtmAddr
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ATM address for this atmHostEntry.

        This is represented as an octet string with specific
        semantics and length as identified by the AtmAddr textual
        convention."
    ::= { atmHostEntry 2 }

atmHostQoS OBJECT-TYPE
    SYNTAX      QoSIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The quality of service classification for this entry.  See
        the QoSFilter textual convention for details and specific
        QoS values."
    ::= { atmHostEntry 3 }

atmHostCreateTime OBJECT-TYPE
    SYNTAX      LastCreateTime

```



MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The value of sysUpTime when this entry was activated. This  
    can be used by the management station to ensure that the  
    entry has not been deleted and recreated between polls."  
 ::= { atmHostEntry 4 }

atmHostInP2pCells OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of error-free cells detected on point-to-point  
    circuits in which this ATM address was identified as the  
    called party."  
 ::= { atmHostEntry 5 }

atmHostOutP2pCells OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of error-free cells detected on point-to-point  
    circuits in which this ATM address was identified as the  
    calling party."  
 ::= { atmHostEntry 6 }

atmHostInP2mpCells OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of error-free cells detected on point-to-  
    multipoint circuits in which this ATM address was identified  
    as the called party."  
 ::= { atmHostEntry 7 }

atmHostOutP2mpCells OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of error-free cells detected on point-to-  
    multipoint circuits in which this ATM address was identified



as the calling party."  
 ::= { atmHostEntry 8 }

atmHostInHCP2pCells OBJECT-TYPE

SYNTAX ZeroBasedCounter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of error-free cells detected on point-to-point circuits in which this ATM address was identified as the called party."

::= { atmHostEntry 9 }

atmHostOutHCP2pCells OBJECT-TYPE

SYNTAX ZeroBasedCounter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of error-free cells detected on point-to-point circuits in which this ATM address was identified as the calling party."

::= { atmHostEntry 10 }

atmHostInHCP2mpCells OBJECT-TYPE

SYNTAX ZeroBasedCounter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of error-free cells detected on point-to-multipoint circuits in which this ATM address was identified as the called party."

::= { atmHostEntry 11 }

atmHostOutHCP2mpCells OBJECT-TYPE

SYNTAX ZeroBasedCounter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of error-free cells detected on point-to-multipoint circuits in which this ATM address was identified as the calling party."

::= { atmHostEntry 12 }

atmHostInNumP2pCalls OBJECT-TYPE

SYNTAX ZeroBasedCounter32



MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of calls detected on point-to-point circuits in  
    which this ATM address was identified as the called party."  
 ::= { atmHostEntry 13 }

atmHostOutNumP2pCalls OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of calls detected on point-to-point circuits in  
    which this ATM address was identified as the calling party."  
 ::= { atmHostEntry 14 }

atmHostInNumP2mpCalls OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of calls detected on point-to-multipoint  
    circuits in which this ATM address was identified as the  
    called party."  
 ::= { atmHostEntry 15 }

atmHostOutNumP2mpCalls OBJECT-TYPE  
SYNTAX ZeroBasedCounter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The number of calls detected on point-to-multipoint  
    circuits in which this ATM address was identified as the  
    calling party."  
 ::= { atmHostEntry 16 }

atmHostP2pConnectionTime OBJECT-TYPE  
SYNTAX TimeStamp  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The elapsed time of all calls identified by the associated  
    instances of atmHostInNumP2pCalls and  
    atmHostOutNumP2pCalls."  
 ::= { atmHostEntry 17 }





atmHostP2mpConnectionTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The elapsed time of all calls identified by the associated instances of atmHostInNumP2mpCalls and atmHostOutNumP2mpCalls."

::= { atmHostEntry 18 }

```

--
-- ATM HostTopN Group
--
-- Finds and reports the top traffic contributors,
-- according to associated vcSelectGroup criteria

atmHostTopNControlTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF AtmHostTopNControlEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A set of parameters that control the creation of a report
        of the top N host entries according to a selected metric."
    ::= { atmHost 3 }

atmHostTopNControlEntry OBJECT-TYPE
    SYNTAX      AtmHostTopNControlEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A conceptual row in the atmHostTopNControlTable.

        An example of the indexing of this table is
        atmHostTopNControlDuration.3.1"
    INDEX { vcSelectGroupIndex, atmHostTopNControlIndex }
    ::= { atmHostTopNControlTable 1 }

AtmHostTopNControlEntry ::= SEQUENCE {
    atmHostTopNControlIndex      Integer32,
    atmHostTopNControlRateBase  INTEGER,
    atmHostTopNControlTimeRemaining Integer32,
    atmHostTopNControlGeneratedReports Counter32,
    atmHostTopNControlDuration  Integer32,
    atmHostTopNControlRequestedSize Integer32,
    atmHostTopNControlGrantedSize Integer32,
    atmHostTopNControlStartTime  TimeStamp,
    atmHostTopNControlOwner      OwnerString,
    atmHostTopNControlStatus     RowStatus
}

atmHostTopNControlIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION

```



"An index that is used to uniquely identify an entry in the atmHostTopNControlTable. Each such entry defines one top N report prepared on behalf of one atmHost entry and one vcSelectGroup entry."

```
::= { atmHostTopNControlEntry 1 }
```

#### atmHostTopNControlRateBase OBJECT-TYPE

```
SYNTAX INTEGER {
    atmHostTopNInP2pCells(1),
    atmHostTopNOutP2pCells(2),
    atmHostTopNInP2mpCells(3),
    atmHostTopNOutP2mpCells(4),
    atmHostTopNInNumP2pCalls(5),
    atmHostTopNOutNumP2pCalls(6),
    atmHostTopNInNumP2mpCalls(7),
    atmHostTopNOutNumP2mpCalls(8),
    atmHostTopNP2pConnectionTime(9),
    atmHostTopNP2mpConnectionTime(10)
}
```

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

```
STATUS          current
```

#### DESCRIPTION

"The variable for each atmHost entry that the atmHostTopNEntries are sorted by.

This object may not be modified if the associated atmHostTopNControl STATUS object is equal to active(1)."

```
::= { atmHostTopNControlEntry 2 }
```

#### atmHostTopNControlTimeRemaining OBJECT-TYPE

```
SYNTAX          Integer32
```

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

```
STATUS          current
```

#### DESCRIPTION

"The number of seconds left in the report currently being collected. When this object is modified by the management station, a new collection is started, possibly aborting a currently running report. The new value is used as the requested duration of this report, and is immediately loaded into the associated atmHostTopNControlDuration object. When the report finishes, the probe will automatically start another collection with the same initial value of atmHostTopNControlTimeRemaining. Thus the management station may simply read the resulting reports repeatedly, checking the startTime and duration each time to ensure that



a report was not missed or that the report parameters were not changed.

While the value of this object is non-zero, it decrements by one per second until it reaches zero. At the time that this object decrements to zero, the report is made accessible in the atmHostTopNTable, overwriting any report that may be there.

When this object is modified by the management station, any associated entries in the atmHostTopNTable shall be deleted."

```
DEFVAL { 1800 }
 ::= { atmHostTopNControlEntry 3 }
```

atmHostTopNControlGeneratedReports OBJECT-TYPE

```
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of reports that have been generated by this
    entry."
 ::= { atmHostTopNControlEntry 4 }
```

atmHostTopNControlDuration OBJECT-TYPE

```
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of seconds that this report has collected during
    the last sampling interval.
```

When the associated atmHostTopNControlTimeRemaining object is set, this object shall be set by the probe to the same value and shall not be modified until the next time the atmHostTopNControlTimeRemaining is set.

This value shall be zero if no reports have been requested for this atmHostTopNControlEntry."

```
 ::= { atmHostTopNControlEntry 5 }
```

atmHostTopNControlRequestedSize OBJECT-TYPE

```
SYNTAX      Integer32
MAX-ACCESS  read-create
STATUS      current
```



## DESCRIPTION

"The maximum number of host entries requested for this report.

When this object is created or modified, the probe should set atmHostTopNControlGrantedSize as closely to this object as is possible for the particular probe implementation and available resources."

DEFVAL { 150 }

::= { atmHostTopNControlEntry 6 }

## atmHostTopNControlGrantedSize OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The maximum number of host entries in this report.

When the associated atmHostTopNControlRequestedSize object is created or modified, the probe should set this object as closely to the requested value as is possible for the particular implementation and available resources. The probe must not lower this value except as a result of a set to the associated atmHostTopNControlRequestedSize object.

For example, if the value of atmHostTopNControlRateBase is equal to atmHostTopNP2pCells(1), when the next topN report is generated, host entries with the highest value of atmHostP2pCells shall be placed in this table in decreasing order of this rate until there is no more room or until there are no more host entries. Each atmHostP2pCells value is copied to the associated atmHostTopNRate object.

It is an implementation-specific matter how entries with the same value are sorted. It is also an implementation-specific matter as to whether or not zero-valued entries are available."

::= { atmHostTopNControlEntry 7 }

## atmHostTopNControlStartTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The value of sysUpTime when this top N report was last





started. In other words, this is the time that the associated atmHostTopNControlTimeRemaining object was modified to start the requested report or the time the report was last automatically (re)started.

This object may be used by the management station to determine if a report was missed or not."

::= { atmHostTopNControlEntry 8 }

atmHostTopNControlOwner OBJECT-TYPE

SYNTAX OwnerString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The entity that configured this entry and is therefore using the resources assigned to it."

::= { atmHostTopNControlEntry 9 }

atmHostTopNControlStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this atmHostTopNControlEntry.

An entry may not exist in the active state unless all objects in the entry have an appropriate value.

If this object is not equal to active(1), all associated entries in the atmHostTopNTable shall be deleted by the agent."

::= { atmHostTopNControlEntry 10 }



```

--
-- atmHostTopNTable
--
atmHostTopNTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF AtmHostTopNEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A set of statistics for those network layer matrix entries
         that have counted the highest number of octets or packets."
    ::= { atmHost 4 }

atmHostTopNEntry OBJECT-TYPE
    SYNTAX      AtmHostTopNEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A conceptual row in the atmHostTopNTable.

        The atmHostTopNControlIndex value in the index identifies
        the atmHostTopNControlEntry on whose behalf this entry was
        created.

        An example of the indexing of this table is
        atmHostTopNAddress.1.3.10"
    INDEX { vcSelectGroupIndex, atmHostTopNControlIndex,
            atmHostTopNIndex }
    ::= { atmHostTopNTable 1 }

AtmHostTopNEntry ::= SEQUENCE {
    atmHostTopNIndex      Integer32,
    atmHostTopNAddress    AtmAddr,
    atmHostTopNRate       Integer32
    -- what to do about HCRate?? Need the SMI to support Integer64!
}

atmHostTopNIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An index that uniquely identifies an entry in the
         atmHostTopNTable among those in the same report. This index
         is between 1 and N, where N is the number of entries in this
         report."

```



Each host in the selected hostTable, for the report interval, is ranked in descending order of the metric identified by the atmHostTopNRate object.

For example, if the value of atmHostTopNControlRateBase is equal to atmHostTopNP2pCells(1), increasing values of atmHostTopNIndex shall be assigned to entries with decreasing delta values of atmHostP2pCells (for the report interval), until index N is assigned or there are no more atmHostTopNEntries."

```
::= { atmHostTopNEntry 1 }
```

atmHostTopNAddress OBJECT-TYPE

SYNTAX AtmAddr

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The ATM address of this host. Only non-zero length variants of AtmAddr textual convention are allowed in this table."

```
::= { atmHostTopNEntry 2 }
```

atmHostTopNRate OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the ranked metric for this host, for this report.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNInP2pCells(1), then this object is assigned the delta value of the atmHostInP2pCells object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNOutP2pCells(2), then this object is assigned the delta value of the atmHostOutP2pCells object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNInP2mpCells(3), then this object is assigned the delta value of the atmHostInP2mpCells object during this report interval.

If the associated value of atmHostTopNRateBase is equal to



atmHostTopNOutP2mpCells(4), then this object is assigned the delta value of the atmHostOutP2mpCells object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNInNumP2pCalls(5), then this object is assigned the delta value of the atmHostInNumP2pCalls object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNOutNumP2pCalls(6), then this object is assigned the delta value of the atmHostOutNumP2pCalls object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNInNumP2mpCalls(7), then this object is assigned the delta value of the atmHostInNumP2mpCalls object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNOutNumP2mpCalls(8), then this object is assigned the delta value of the atmHostOutNumP2mpCalls object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNP2pConnectionTime(9), then this object is assigned the delta value of the atmHostP2pConnectionTime object during this report interval.

If the associated value of atmHostTopNRateBase is equal to atmHostTopNP2mpConnectionTime(10), then this object is assigned the delta value of the atmHostP2mpConnectionTime object during this report interval."

```
::= { atmHostTopNEntry 3 }
```





```

--
-- ATM Matrix Group
--
-- Counts the amount of traffic sent on behalf of each source
-- and destination ATM address discovered by the probe,
-- according to associated vcSelectGroup criteria

atmMatrixControlTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF AtmMatrixControlEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A list of ATM matrix table control entries.

        These entries will enable the collection of ATM matrix
        information in the atmMatrixTable.

        Entries in the atmMatrixTable will be created on behalf of
        each entry in this table. A probe is required to support at
        most one atmMatrix collection per instance of an associated
        vcSelectGroup, therefore the table is indexed by the
        vcSelectGroupIndex.

        Default monitor-owned atmMatrixControl entries:
            [TBD]"
    ::= { atmMatrix 1 }

atmMatrixControlEntry OBJECT-TYPE
    SYNTAX      AtmMatrixControlEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A conceptual row in the atmMatrixControlTable. Entries in
        this table are identified and indexed by the
        vcSelectGroupIndex object. At most one atmMatrix collection
        is done per vcSelectGroup.

        An example of the indexing of this entry is
        atmMatrixControlInserts.1"
    INDEX { vcSelectGroupIndex }
    ::= { atmMatrixControlTable 1 }

AtmMatrixControlEntry ::= SEQUENCE {
    atmMatrixControlInserts      Counter32,
    atmMatrixControlDeletes      Counter32,

```



```
    atmMatrixControlMaxDesiredEntries   Integer32,
    atmMatrixControlPriority             ResourcePriority,
    atmMatrixControlDroppedCells        Counter32,
    atmMatrixControlHCDroppedCells      Counter64,
    atmMatrixControlOwner                OwnerString,
    atmMatrixControlStatus               RowStatus
}
```

atmMatrixControlInserts OBJECT-TYPE

```
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
```

"The number of times an atmMatrix entry has been inserted into the atmMatrix table. If an entry is inserted, then deleted, and then inserted, this counter will be incremented by 2.

To allow for efficient implementation strategies, agents may delay updating this object for short periods of time. For example, an implementation strategy may allow internal data structures to differ from those visible via SNMP for short periods of time. This counter may reflect the internal data structures for those short periods of time.

Note that the table size can be determined by subtracting atmMatrixControlDeletes from atmMatrixControlInserts."

```
::= { atmMatrixControlEntry 1 }
```

atmMatrixControlDeletes OBJECT-TYPE

```
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
```

"The number of times an atmMatrix entry has been deleted from the atmMatrix table (for any reason). If an entry is deleted, then inserted, and then deleted, this counter will be incremented by 2.

To allow for efficient implementation strategies, agents may delay updating this object for short periods of time. For example, an implementation strategy may allow internal data structures to differ from those visible via SNMP for short periods of time. This counter may reflect the internal data structures for those short periods of time.



Note that the table size can be determined by subtracting  
atmMatrixControlDeletes from atmMatrixControlInserts."  
 ::= { atmMatrixControlEntry 2 }

atmMatrixControlMaxDesiredEntries OBJECT-TYPE

SYNTAX Integer32  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION

"The maximum number of entries that are desired in the  
atmMatrixTable on behalf of this control entry. The probe  
will not create more than this number of associated entries  
in the table, but may choose to create fewer entries in this  
table for any reason including the lack of resources.

If this object is set to a value less than the current  
number of entries, enough entries are chosen in an  
implementation-dependent manner and deleted so that the  
number of entries in the table equals the value of this  
object.

If this value is set to -1, the probe may create any number  
of entries in this table. If the associated  
atmMatrixControl STATUS object is equal to active(1), this  
object may not be modified.

This object may be used to control how resources are  
allocated on the probe for the various RMON functions."

::= { atmMatrixControlEntry 3 }

atmMatrixControlPriority OBJECT-TYPE

SYNTAX ResourcePriority  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION

"The priority this collection should be given to retain  
resources, in the event the probe must reclaim some  
resources in order to add new entries to an existing  
atmMatrix collection or add new collections of other types."

DEFVAL { normalPriority(2) }  
 ::= { atmMatrixControlEntry 4 }

atmMatrixControlDroppedCells OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only



STATUS current

DESCRIPTION

"The total number of cells which were received by the probe but for which the probe chose not to count in this collection for whatever reason. Most often, this event occurs when the probe is out of some resources and decides to shed load from one or more collections.

This count does not include cells that were not counted because they had errors."

::= { atmMatrixControlEntry 5 }

atmMatrixControlHCDroppedCells OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of cells which were received by the probe but for which the probe chose not to count in this collection for whatever reason. Most often, this event occurs when the probe is out of some resources and decides to shed load from one or more collections.

This count does not include cells that were not counted because they had errors."

::= { atmMatrixControlEntry 6 }

atmMatrixControlOwner OBJECT-TYPE

SYNTAX OwnerString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The entity that configured this entry and is therefore using the resources assigned to it."

::= { atmMatrixControlEntry 7 }

atmMatrixControlStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this atmMatrixControlEntry.

An entry may not exist in the active state unless all objects in the entry have an appropriate value.





Specifically, the associated instances of atmMatrixControlMaxDesiredEntries, atmMatrixControlPriority, and vcSelectGroup STATUS must be equal to active(1) before this object may be set to active(1).

If this object is not equal to active(1), all associated entries in the atmMatrixTable shall be deleted."

```
::= { atmMatrixControlEntry 8 }
```

```
-- atmMatrixTable
-- call and traffic data collected on behalf of specific
-- vcSelectGroups
```

```
atmMatrixTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF AtmMatrixEntry
```

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

```
STATUS current
```

```
DESCRIPTION
```

"A collection of statistics for a particular ATM host address that has been discovered on behalf of the vcSelectGroup associated with this entry. Note that only non-zero length variants of the AtmAddr object are collected in this table.

The probe will add to this table all addresses seen as the source or destination address in all cells identified by the associated vcSelectGroupEntry criteria."

```
::= { atmMatrix 2 }
```

```
atmMatrixEntry OBJECT-TYPE
```

```
SYNTAX AtmMatrixEntry
```

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

```
STATUS current
```

```
DESCRIPTION
```

"A conceptual row in the atmMatrixTable.

The vcSelectGroupIndex value in the index identifies the vcSelectGroup on whose behalf this entry was created.

An example of the indexing of this entry is  
atmMatrixInP2pCells.4.28980.20.<NSAP>.20.<NSAP>.3"

```
INDEX { vcSelectGroupIndex, atmMatrixTimeMark,
        atmMatrixCallingAddress, atmMatrixCalled,
        atmMatrixQoS }
```

```
::= { atmMatrixTable 1 }
```

```
AtmMatrixEntry ::= SEQUENCE {
```

```
  atmMatrixTimeMark      TimeFilter,
```

```
  atmMatrixCallingAddress AtmAddr,
```

```
  atmMatrixCalledAddress AtmAddr,
```

```
  atmMatrixQoS           QoSIndex,
```

```
  atmMatrixCreateTime    LastCreateTime,
```

```
  atmMatrixP2pCells      ZeroBasedCounter32,
```

```
  atmMatrixP2mpCells     ZeroBasedCounter32,
```



```
    atmMatrixHCP2pCells      ZeroBasedCounter64,
    atmMatrixHCP2mpCells     ZeroBasedCounter64,
    atmMatrixNumP2pCalls     ZeroBasedCounter32,
    atmMatrixNumP2mpCalls    ZeroBasedCounter32,
    atmMatrixP2pConnectionTime TimeStamp,
    atmMatrixP2mpConnectionTime TimeStamp
}

atmMatrixTimeMark OBJECT-TYPE
    SYNTAX      TimeFilter
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A TimeFilter for this entry.  See the TimeFilter textual
        convention in [RMON2-MIB] to see how this works."
    ::= { atmMatrixEntry 1 }

atmMatrixCallingAddress OBJECT-TYPE
    SYNTAX      AtmAddr
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The calling party ATM address for this atmMatrixEntry.

        This is represented as an octet string with specific
        semantics and length as identified by the AtmAddr textual
        convention."
    ::= { atmMatrixEntry 2 }

atmMatrixCalledAddress OBJECT-TYPE
    SYNTAX      AtmAddr
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The called party ATM address for this atmMatrixEntry.

        This is represented as an octet string with specific
        semantics and length as identified by the AtmAddr textual
        convention."
    ::= { atmMatrixEntry 3 }

atmMatrixQos OBJECT-TYPE
    SYNTAX      QoSIndex
    MAX-ACCESS  not-accessible
    STATUS      current
```



## DESCRIPTION

"The quality of service classification for this entry. See the QoSFilter textual convention for details and specific QoS values."

::= { atmMatrixEntry 4 }

## atmMatrixCreateTime OBJECT-TYPE

SYNTAX LastCreateTime

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The value of sysUpTime when this entry was activated. This can be used by the management station to ensure that the entry has not been deleted and recreated between polls."

::= { atmMatrixEntry 5 }

## atmMatrixP2pCells OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of error-free cells detected on point-to-point circuits in which these ATM addresses were identified as the calling and called parties."

::= { atmMatrixEntry 6 }

## atmMatrixP2mpCells OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of error-free cells detected on point-to-multipoint circuits in which these ATM addresses were identified as the calling and called parties."

::= { atmMatrixEntry 7 }

## atmMatrixHCP2pCells OBJECT-TYPE

SYNTAX ZeroBasedCounter64

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of error-free cells detected on point-to-point circuits in which these ATM addresses were identified as the calling and called parties."

::= { atmMatrixEntry 8 }





## atmMatrixHCP2mpCells OBJECT-TYPE

SYNTAX ZeroBasedCounter64

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of error-free cells detected on point-to-multipoint circuits in which these ATM addresses were identified as the calling and called parties."

::= { atmMatrixEntry 9 }

## atmMatrixNumP2pCalls OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of calls detected on point-to-point circuits in which these ATM addresses were identified as the calling and called parties."

::= { atmMatrixEntry 10 }

## atmMatrixNumP2mpCalls OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of calls detected on point-to-multipoint circuits in which these ATM addresses were identified as the calling and called parties."

::= { atmMatrixEntry 11 }

## atmMatrixP2pConnectionTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The elapsed time of all calls identified by the associated instance of atmMatrixNumP2pCalls."

::= { atmMatrixEntry 12 }

## atmMatrixP2mpConnectionTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The elapsed time of all calls identified by the associated



```
        instance of atmMatrixNumP2mpCalls."  
 ::= { atmMatrixEntry 13 }
```

-- TBD: atmMatrixTopN group

-- Conformance Macros

```
atmRmonMIBCompliances OBJECT IDENTIFIER ::= { atmRmonConformance 1 }
atmRmonMIBGroups       OBJECT IDENTIFIER ::= { atmRmonConformance 2 }
```

atmRmonMIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"Describes the requirements for conformance to the ATM-RMON MIB.

TBD: separate conformance statements with and without 64 bit counters."

MODULE -- this module

```
MANDATORY-GROUPS { vcSelectGroup,
                    atmStatsGroup,
                    atmHostGroup,
                    atmMatrixGroup }
```

```
::= { atmRmonMIBCompliances 1 }
```

vcSelectGroup OBJECT-GROUP

```
OBJECTS { vcSelectGroupDescr, vcSelectGroupCreateTime,
          vcSelectGroupOwner, vcSelectGroupStatus,
          pvcSelectIfIndex, pvcSelectVPI,
          pvcSelectVCI, pvcSelectInclude,
          pvcSelectCreateTime, pvcSelectOwner,
          pvcSelectStatus, svcSelectIndex,
          svcSelectIfIndex, svcSelectAddr,
          svcSelectAddrMask, svcSelectInclude,
          svcSelectCreateTime, svcSelectOwner,
          svcSelectStatus }
```

STATUS current

DESCRIPTION

"Selects the virtual circuits that should be monitored as part of a specific collection-group."

```
::= { atmRmonMIBGroups 1 }
```

atmStatsGroup OBJECT-GROUP

```
OBJECTS { atmStatsControlDroppedCells,
          atmStatsControlHCDroppedCells,
          atmStatsControlOwner,
          atmStatsControlStatus,
          atmStatsCreateTime,
          atmStatsP2pCells,
```



```

    atmStatsP2mpCells,
    atmStatsHCP2pCells,
    atmStatsHCP2mpCells,
    atmStatsNumP2pCalls,
    atmStatsNumP2mpCalls,
    atmStatsP2pConnectionTime,
    atmStatsP2mpConnectionTime }

```

STATUS current

DESCRIPTION

"Counts the basic statistics for collections on behalf of particular vcSelectGroup collections."

::= { atmRmonMIBGroups 2 }

atmHostGroup OBJECT-GROUP

OBJECTS {

```

    atmHostControlInserts,
    atmHostControlDeletes,
    atmHostControlMaxDesiredEntries,
    atmHostControlPriority,
    atmHostControlDroppedCells,
    atmHostControlHCDroppedCells,
    atmHostControlOwner,
    atmHostControlStatus,
    atmHostCreateTime,
    atmHostInP2pCells, atmHostOutP2pCells,
    atmHostInP2mpCells, atmHostOutPm2pCells,
    atmHostInHCP2pCells, atmHostOutHCP2pCells,
    atmHostInHCP2mpCells, atmHostOutHCPm2pCells,
    atmHostInNumP2pCalls, atmHostOutNumP2pCalls,
    atmHostInNumP2mpCalls, atmHostOutNumP2mpCalls,
    atmHostP2pConnectionTime,
    atmHostP2mpConnectionTime,
    atmHostTopNControlRateBase,
    atmHostTopNControlTimeRemaining,
    atmHostTopNControlGeneratedReports,
    atmHostTopNControlDuration,
    atmHostTopNControlRequestedSize,
    atmHostTopNControlGrantedSize,
    atmHostTopNControlStartTime,
    atmHostTopNControlOwner,
    atmHostTopNControl STATUS,
    atmHostTopNAddress, atmHostTopNRate }

```

STATUS current

DESCRIPTION

"Counts the amount of traffic sent from and to each ATM



```
        address discovered by the probe, on behalf of particular
        vcSelectGroup collections."
 ::= { atmRmonMIBGroups 3 }
```

```
atmMatrixGroup OBJECT-GROUP
```

```
  OBJECTS { atmMatrixControlInserts,
            atmMatrixControlDeletes,
            atmMatrixControlMaxDesiredEntries,
            atmMatrixControlPriority,
            atmMatrixControlDroppedCells,
            atmMatrixControlHCDroppedCells,
            atmMatrixControlOwner,
            atmMatrixControlStatus,
            atmMatrixCreateTime,
            atmMatrixP2pCells,
            atmMatrixP2mpCells,
            atmMatrixHCP2pCells,
            atmMatrixHCP2mpCells,
            atmMatrixNumP2pCalls,
            atmMatrixNumP2mpCalls,
            atmMatrixP2pConnectionTime,
            atmMatrixP2mpConnectionTime }
```

```
STATUS current
```

```
DESCRIPTION
```

```
    "Counts the amount of traffic sent between each pair of ATM
    addresses discovered by the probe, on behalf of particular
    vcSelectGroup collections."
```

```
 ::= { atmRmonMIBGroups 4 }
```

```
END
```





## **5. Acknowledgements**

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## **7. Security Considerations**

Security issues are not discussed in this memo.

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