1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. A separate memo [16] defines managed objects, in a manner independent of the type of network, for controlling the selection, collection and storage of accounting information into files for later retrieval via a file transfer protocol. This memo defines a set of ATM-specific accounting information which can be collected for connections on ATM networks.
2. The SNMP Network Management Framework

The SNMP Management Framework presently consists of five major components:

- An overall architecture, described in RFC 2271 [1].

- 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 [2], STD 16, RFC 1212 [3] and RFC 1215 [4]. The second version, called SMIv2, is described in RFC 1902 [5], RFC 1903 [6] and RFC 1904 [7].

- Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157 [8]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [9] and RFC 1906 [10]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [10], RFC 2272 [11] and RFC 2274 [12].

- Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [8]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [13].

- A set of fundamental applications described in RFC 2273 [14] and the view-based access control mechanism described in RFC 2275 [15].

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 (e.g., 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.
3. Overview

In [16], the items of accounting data to be collected are specified as a set of objects. Which objects are contained in such a set is selectable by an administrator through the specification of one or more (subtree, list) tuples, where the set of objects to be collected is the union of the subsets specified by each tuple:

'subtree' specifies a OBJECT IDENTIFIER value such that every object in the subset is named by the subtree’s value appended with a single additional sub-identifier.

'list' specifies an OCTET STRING value, such that if the N-th bit of the string's value is set then the the subset contains the object named by appending N as a single additional sub-identifier to the subtree.

This memo specifies such a subtree containing a set of objects defining items of accounting information which are applicable to ATM connections.

Note that all of the objects defined here have a MAX-ACCESS clause of not-accessible, since their purpose is not to be read/written by SNMP, but rather, to be the syntax and semantics of the set of information which can be represented within a single (subtree, list) tuple.

4. Definitions

ATM-ACCOUNTING-INFORMATION-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,
    mib-2, Integer32, Counter64                   FROM SNMPv2-SMI
    DisplayString, DateAndTime                    FROM SNMPv2-TC
    AtmAddr                                       FROM ATM-TC-MIB;

atmAccountingInformationMIB MODULE-IDENTITY
    LAST-UPDATED "96110520000Z"
    ORGANIZATION "IETF AToM MIB Working Group"
    CONTACT-INFO "
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DESCRIPTION
"The MIB module for identifying items of accounting
information which are applicable to ATM connections."
::= { mib-2 59 }

atmAcctngMIBObjects OBJECT IDENTIFIER ::= 
{ atmAccountingInformationMIB 1 }

-- Definitions of objects for use in specifying ATM accounting
data to be collected

atmAcctngDataObjects OBJECT-IDENTITY
  STATUS current
  DESCRIPTION
  "This identifier defines a subtree under which various
  objects are defined such that a set of objects to be
  collected as ATM accounting data can be specified as a
  (subtree, list) tuple using this identifier as the subtree."
  ::= { atmAcctngMIBObjects 1 }

  -- Objects defined under the atmAcctngDataObjects subtree
  --
  -- In each case the semantics of the object are interpreted with
  -- respect to the creation/storage of an accounting record for a
  -- particular connection on a particular interface.

atmAcctngConnectionType OBJECT-TYPE
  SYNTAX INTEGER { pvc(1),
                   pvp(2),
                   svcIncoming(3),
                   svcOutgoing(4),
                  svpIncoming(5),
                  svpOutgoing(6),
                   spvcInitiator(7),
                   spvcTarget(8),
                   spvpInitiator(9),
                   spvpTarget(10) }
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
  "The type of connection."
  ::= { atmAcctngDataObjects 1 }

atmAcctngCastType OBJECT-TYPE
  SYNTAX INTEGER { p2p(1), p2mp(2) }
  MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
  "An indication of whether the connection is point-to-point
  or point-to-multipoint."
::= { atmAcctngDataObjects 2 }

atmAcctngIfName OBJECT-TYPE
SYNTAX      DisplayString
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "A textual name for the interface on which the data for the
  connection was collected. If the local SNMP agent supports
  the object ifName, the value of this object must be
  identical to that of ifName in the conceptual row of the
  ifTable corresponding to this interface."
::= { atmAcctngDataObjects 3 }

atmAcctngIfAlias OBJECT-TYPE
SYNTAX      DisplayString
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The 'alias' name for the interface as specified by a
  network manager, e.g., via a management set operation to
  modify the relevant instance of the ifAlias object. Note
  that in contrast to ifIndex, ifAlias provides a non-volatile
  'handle' for the interface, the value of which is retained
  across agent reboots."
::= { atmAcctngDataObjects 4 }

atmAcctngVpi OBJECT-TYPE
SYNTAX      INTEGER (0..4095)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The VPI used for the connection."
::= { atmAcctngDataObjects 5 }

atmAcctngVci OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The VCI used for the connection."
::= { atmAcctngDataObjects 6 }

atmAcctngCallingParty OBJECT-TYPE
SYNTAX    AtmAddr
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
  "The connection’s calling party. If unknown (e.g., for a
  PVC), then the value of this object is the zero-length
  string."
 ::= { atmAcctngDataObjects 7 }

atmAcctngCalledParty OBJECT-TYPE
SYNTAX    AtmAddr
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
  "The connection’s called party. If unknown (e.g., for a
  PVC), then the value of this object is the zero-length
  string."
 ::= { atmAcctngDataObjects 8 }

atmAcctngCallReference OBJECT-TYPE
SYNTAX    OCTET STRING (SIZE(0..3))
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
  "The connection’s call reference value (e.g., from Q.2931).
  If unknown (e.g., for a PVC), then the value of this object
  is the zero-length string."
 ::= { atmAcctngDataObjects 9 }

atmAcctngStartTime OBJECT-TYPE
SYNTAX    DateAndTime
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
  "The time when the connection was established."
 ::= { atmAcctngDataObjects 10 }

atmAcctngCollectionTime OBJECT-TYPE
SYNTAX    DateAndTime
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
  "The time at which the data in this record was collected."
 ::= { atmAcctngDataObjects 11 }

atmAcctngCollectMode OBJECT-TYPE
SYNTAX    INTEGER {
onRelease(1),
  periodically(2),
onCommand(3) }
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The reason why this connection data was collected."
 ::= { atmAcctngDataObjects 12 }

atmAcctngReleaseCause OBJECT-TYPE
SYNTAX     Integer32
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"If the connection data was collected because of the release
of an SVC, then this is the cause code in the Release
message for the connection; otherwise, this object has the
value zero."
 ::= { atmAcctngDataObjects 13 }

atmAcctngServiceCategory OBJECT-TYPE
SYNTAX      INTEGER { other(1), cbr(2), vbrRt(3), vbrNrt(4),
                        abr(5), ubr(6), unknown(7) }
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The connection’s service category."
 ::= { atmAcctngDataObjects 14 }

atmAcctngTransmittedCells OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The number of cells, including OAM cells, transmitted by
this switch on this connection."
 ::= { atmAcctngDataObjects 15 }

atmAcctngTransmittedClp0Cells OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The number of cells with CLP=0, including OAM cells,
transmitted by this switch on this connection."
 ::= { atmAcctngDataObjects 16 }

atmAcctngReceivedCells OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS not-accessible
atmAcctngReceivedClp0Cells OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The number of cells with CLP=0, including OAM cells, received by this switch on this connection."
::= { atmAcctngDataObjects 18 }

atmAcctngTransmitTrafficDescriptorType OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The traffic descriptor type (as defined in RFC 1695 and its successors) in the direction in which the switch transmits cells on the connection."
REFERENCE "See atmTrafficDescriptorTypes in ATM-MIB.my in RFC 1695 and its successors."
::= { atmAcctngDataObjects 19 }

atmAcctngTransmitTrafficDescriptorParam1 OBJECT-TYPE
SYNTAX INTEGER (0..2147483647)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The first traffic descriptor parameter in the direction in which this switch transmits cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngTransmitTrafficDescriptorType."
::= { atmAcctngDataObjects 20 }

atmAcctngTransmitTrafficDescriptorParam2 OBJECT-TYPE
SYNTAX INTEGER (0..2147483647)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The second traffic descriptor parameter in the direction in which this switch transmits cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngTransmitTrafficDescriptorType."
::= { atmAcctngDataObjects 21 }

atmAcctngTransmitTrafficDescriptorParam3 OBJECT-TYPE
SYNTAX INTEGER (0..2147483647)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The third traffic descriptor parameter in the direction in
which this switch transmits cells on this connection.
Interpretation of this parameter is dependent on the value
of atmAcctngTransmitTrafficDescriptorType."
::= { atmAcctngDataObjects 22 }

atmAcctngTransmitTrafficDescriptorParam4 OBJECT-TYPE
SYNTAX INTEGER (0..2147483647)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The fourth traffic descriptor parameter in the direction in
which this switch transmits cells on this connection.
Interpretation of this parameter is dependent on the value
of atmAcctngTransmitTrafficDescriptorType."
::= { atmAcctngDataObjects 23 }

atmAcctngTransmitTrafficDescriptorParam5 OBJECT-TYPE
SYNTAX INTEGER (0..2147483647)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The fifth traffic descriptor parameter in the direction in
which this switch transmits cells on this connection.
Interpretation of this parameter is dependent on the value
of atmAcctngTransmitTrafficDescriptorType."
::= { atmAcctngDataObjects 24 }

atmAcctngReceiveTrafficDescriptorType OBJECT-TYPE
SYNTAX OCTET STRING
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The traffic descriptor type (as defined in RFC 1695 and its
successors) in the direction in which this switch receives
cells on this connection."
REFERENCE "See atmTrafficDescriptorTypes in ATM-MIB.my in RFC 1695 and
its successors."
::= { atmAcctngDataObjects 25 }
atmAcctngReceiveTrafficDescriptorParam1 OBJECT-TYPE
SYNTAX      INTEGER (0..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The first traffic descriptor parameter in the direction in which this switch receives cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngReceiveTrafficDescriptorType."
 ::= { atmAcctngDataObjects 26 }

atmAcctngReceiveTrafficDescriptorParam2 OBJECT-TYPE
SYNTAX      INTEGER (0..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The second traffic descriptor parameter in the direction in which this switch receives cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngReceiveTrafficDescriptorType."
 ::= { atmAcctngDataObjects 27 }

atmAcctngReceiveTrafficDescriptorParam3 OBJECT-TYPE
SYNTAX      INTEGER (0..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The third traffic descriptor parameter in the direction in which this switch receives cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngReceiveTrafficDescriptorType."
 ::= { atmAcctngDataObjects 28 }

atmAcctngReceiveTrafficDescriptorParam4 OBJECT-TYPE
SYNTAX      INTEGER (0..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The fourth traffic descriptor parameter in the direction in which this switch receives cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngReceiveTrafficDescriptorType."
 ::= { atmAcctngDataObjects 29 }

atmAcctngReceiveTrafficDescriptorParam5 OBJECT-TYPE
SYNTAX      INTEGER (0..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION

"The fifth traffic descriptor parameter in the direction in which this switch receives cells on this connection. Interpretation of this parameter is dependent on the value of atmAcctngReceiveTrafficDescriptorType."

::= { atmAcctngDataObjects 30 }

atmAcctngCallingPartySubAddress OBJECT-TYPE
SYNTAX AtmAddr
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"The connection’s calling party sub-address. If the connection has no calling party sub-address, or it’s value is unknown, then the value of this object is the zero-length string."

::= { atmAcctngDataObjects 31 }

atmAcctngCalledPartySubAddress OBJECT-TYPE
SYNTAX AtmAddr
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"The connection’s called party sub-address. If the connection has no called party sub-address, or it’s value is unknown, then the value of this object is the zero-length string."

::= { atmAcctngDataObjects 32 }

atmAcctngRecordCrc16 OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"The value of the CRC-16 checksum (as defined by ISO 3309 (HDLC) and/or ITU X.25) calculated over the accounting record containing this object.

While the mechanism for calculating/encoding the checksum value is specific to the method of encoding the accounting record, an accounting record containing this object is typically generated by initializing the value of this object to the all-zeros string (’0000’H), with the location of these zeros being saved. After generating the record, the checksum is calculated over the whole connection record and then the all-zeros value is overwritten (at the saved location) by the calculated value of the checksum."

::= { atmAcctngDataObjects 33 }

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5. Acknowledgements

The comments of the IETF’s AToM MIB Working Group are acknowledged.

6. References


7. Security Considerations

This MIB module defines data items for potential use as accounting information. Each of these data items is only accessible through a collected accounting file. After being collected, the accounting data should be protected against modification or unauthorized deletion.

8. IANA Considerations

Prior to publication of this memo as an RFC, IANA is requested to make a suitable OBJECT IDENTIFIER assignment.
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