                   Accounting Information for ATM Networks

Status of this Memo

   This document specifies an Internet standards track protocol for the
   Internet community, and requests discussion and suggestions for
   improvements. Please refer to the current edition of the "Internet
   Official Protocol Standards" (STD 1) for the standardization state
   and status of this protocol. Distribution of this memo is unlimited.

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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:

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

   o   Mechanisms for describing and naming objects and events for the
         purpose of management. The first version of this Structure of
         Management Information (SMI) is called SMIv1 and described in
         STD 16, RFC 1155 [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].

   o   Message protocols for transferring management information. The
         first version of the SNMP message protocol is called SNMPv1 and
         described in STD 15, RFC 1157 [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].

   o   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].

   o   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 "9611052000Z"
    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
```

              STATUS   current
              DESCRIPTION
                     "The number of cells, including OAM cells, received by this
                     switch on this connection."
              ::= { atmAcctngDataObjects 17 }

        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   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 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 }

END

5. Acknowledgements

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

6. References

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        Control Model (VACM) for the Simple Network Management Protocol
        (SNMP)", RFC 2275, January 1998.

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        Objects for Controlling the Collection and Storage of Accounting
        Information for Connection-Oriented Networks", RFC 2513,
        February 1999.

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        Conventions and OBJECT-IDENTITIES for ATM Management", RFC 2514,
        February 1999.

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.

9. Authors' Addresses

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