                    Definitions of Managed Objects for
               Multicast over UNI 3.0/3.1 based 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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Abstract

   This memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it describes managed objects for IP hosts and routers
   that use a Multicast Address Resolution Server (MARS) to support IP
   multicast over ATM, as described in 'Support for Multicast over UNI
   3.0/3.1 based ATM Networks' [1].

   This memo specifies a MIB module in a manner that is both compliant
   to the SNMPv2 SMI, and semantically identical to the peer SNMPv1
   definitions.

   This memo does not specify a standard for the Internet community.

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1. The SNMP Network Management Framework

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

    o   the SMI, described in RFC 1902 [2] - the mechanisms used for
           describing and naming objects for the purpose of management.

    o   the Textual Conventions, described in RFC 1903 [3] for SNMPv2.

    o   the Conformance Statements, described in RFC 1904 [4] for
           SNMPv2.

    o   the Simple Network Management Protocol, described in
           RFC 1157 [5].

    o   the Protocol Operations, described in RFC 1905 [6] for
           SNMPv2.

    o   the MIB-II, STD 17, RFC 1213 [7] - the core set of managed
           objects for the Internet suite of protocols for SNMPv2.

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

1.1. Object Definitions

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

2. Overview

   This MARS MIB is designed to define managed objects that can be used
   to manage the MARS clients, servers, and the multicast servers (MCS),
   as described in the RFC2022[1]. The MIB is supposed to be used on a
   system where one or more MARS clients are running, or where one or
   more MARS servers are running, or where one or more MARS multicast
   servers are running.

   An understanding of MARS, as defined in [1] is assumed in this MIB
   module definition. However, the following terms are used frequently
   and are included here for reference:

   Multicast Group

   A group of endpoints that communicate with each other such that
   packets sent from one endpoint are received by all other members of
   the multicast group.

   Multicast Address Resolution Server (MARS)

   A server that distributes multicast group membership information to
   endpoints.

   Client/Endpoint

   An ATM-attached host or router that registers with a MARS and that is
   a member of one or more multicast groups. An endpoint may establish
   ATM Virtual Channels (VCs) to the other group members or may make use
   of a Multicast Server.

   Cluster

   The set of clients managed by a MARS.

   Multicast Server (MCS)

   A server that sets up ATM Virtual Channels (VCs) between endpoints in
   a multicast group and to which the endpoints forward data traffic for
   transmission on their behalf.

   The MIB is broken down into three major groups: a MARS client group,
   MARS (server) group, and MARS Multicast Server (MCS) Group.

2.1. The MARS Client Group

   This client group defines a collection of objects required to be
   implemented in a MIB for the management of MARS clients. It contains
   the following tables:

   o   MARS Client Table

   Information about a client such as its ATM address, the ATM address
   of its default MARS, registration status, and timers.

   o   MARS Client Multicast Group Table

   A list of IP multicast address blocks associated with a MARS client.

   o   MARS Client Backup MARS Group Table

   A list of backup MARS's associated with a MARS client.

   o   MARS Client VC Table

   Information about VCs opened by a client.

   o   MARS Client Statistics Table

   Statistics collected by a MARS client.

2.2. The MARS Server Group

   This MARS server group defines a collection of objects required to be
   implemented in a MIB for the management of MARS servers. It contains
   the following tables:

   o   MARS Table

   Information about a MARS such as its ATM address, its status and
   timers.

   o   MARS Multicast Group Table

   A list of IP multicast address blocks associated with a MARS.

   o   MARS VC Table

   Information about VCs opened by a MARS.

   o   MARS Registered Client Table

A list of clients registered with a MARS.

o   MARS Registered Multicast Server Table

A list of MCSs registered with a MARS.

o   MARS Statistics Table

Statistics collected by a MARS.

o   MARS Host Map Table

Mappings between multicast groups and clients maintained by a MARS.

o   MARS Server Map Table

Mappings between multicast groups and MCSs maintained by a MARS.

2.3. The MARS Multicast Server Group

This MARS multicast server group defines a collection of objects
required to be implemented in a MIB for the management of MARS
multicast servers. It contains the following tables:

This group contains the following tables:

o   MARS Multicast Server Table

Information about a MCS, such as its ATM address, default MARS ATM
address, and registration state.

o   MARS MCS Multicast Group Table

A list of IP multicast address blocks associated with a MARS MCS.

o   MARS MCS Backup Mars Group Table

A list of backup MARS's associated with a MARS MCS.

o   MARS Multicast Server VC Table

Information about VCs opened by a MCS.

o   MARS Multicast Server Statistics Table

Statistics collected by a MCS.

3. IP Over ATM Multicast Address Resolution Server MIB Definitions

    IPATM-IPMC-MIB DEFINITIONS ::= BEGIN

    IMPORTS
        MODULE-COMPLIANCE, NOTIFICATION-GROUP, OBJECT-GROUP
            FROM SNMPv2-CONF
        snmpModules, MODULE-IDENTITY, NOTIFICATION-TYPE, Counter32,
            Integer32, Unsigned32, OBJECT-TYPE, IpAddress
            FROM SNMPv2-SMI
        AtmAddr
            FROM ATM-TC-MIB
        TruthValue, RowStatus
            FROM SNMPv2-TC
        ipAdEntAddr
            FROM RFC1213-MIB
        InterfaceIndex
            FROM IF-MIB;

    marsMIB MODULE-IDENTITY
        LAST-UPDATED "9804150145Z" -- 15 April 1998
        ORGANIZATION "Internetworking Over NBMA (ion) Working Group"
        CONTACT-INFO
            "   Chris Chung
             Postal: SAIC
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             Editor: Maria Greene
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            "
        DESCRIPTION
            "This module defines a portion of the managed information
             base (MIB) for managing classical IP multicast address
             resolution server (MARS) and related entities as
             described in the RFC2022. This MIB is meant to be
             used in conjunction with the ATM-MIB (RFC1695),
             MIB-II (RFC1213), and optionally the IF-MIB (RFC1573)."
        ::= { snmpModules 17 }

    --***
    -- IP ATM MARS Client Object Definitions
    --***

```
    marsClientObjects  OBJECT IDENTIFIER ::= { marsMIB 1 }

    marsClientTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF MarsClientEntry
        MAX-ACCESS   not-accessible
        STATUS current
        DESCRIPTION
            "The objects defined in this table are used for
             the management of MARS clients, ATM attached
             endpoints."
        ::= { marsClientObjects 1 }

    marsClientEntry OBJECT-TYPE
        SYNTAX   MarsClientEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "Each entry contains a MARS client and its associated
             attributes.  An entry in the marsClientTable has
             a corresponding entry in the ipAddrTable defined in
             RFC1213. Association between the ipAddrTable and
             the marsClientTable is made through the index,
             ipAdEntAddr."
        INDEX { ipAdEntAddr, marsClientIndex }
        ::= { marsClientTable 1 }

    MarsClientEntry ::=
        SEQUENCE {
            marsClientIndex                    Integer32,
            marsClientAddr                     AtmAddr,
            marsClientDefaultMarsAddr          AtmAddr,
            marsClientHsn                      Unsigned32,
            marsClientRegistration             INTEGER,
            marsClientCmi                      INTEGER,
            marsClientDefaultMtu               INTEGER,
            marsClientFailureTimer             INTEGER,
            marsClientRetranDelayTimer         INTEGER,
            marsClientRdmMulReqAddRetrTimer    INTEGER,
            marsClientRdmVcRevalidateTimer     INTEGER,
            marsClientJoinLeaveRetrInterval    INTEGER,
            marsClientJoinLeaveRetrLimit       INTEGER,
            marsClientRegWithMarsRdmTimer      INTEGER,
            marsClientForceWaitTimer           INTEGER,
            marsClientLmtToMissRedirMapTimer   INTEGER,
            marsClientIdleTimer                INTEGER,
            marsClientRowStatus                RowStatus
        }
```

```
marsClientIndex OBJECT-TYPE
    SYNTAX  Integer32(1..65535)
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The auxiliary variable used to identify instances of
         the columnar objects in the MARS MarsClientTable."
    ::= { marsClientEntry 1 }

marsClientAddr OBJECT-TYPE
    SYNTAX  AtmAddr
      MAX-ACCESS read-create
      STATUS  current
      DESCRIPTION
          "The ATM address associated with the ATM Client."
      ::= { marsClientEntry 2 }

marsClientDefaultMarsAddr OBJECT-TYPE
    SYNTAX  AtmAddr
      MAX-ACCESS read-create
      STATUS   current
      DESCRIPTION
          "The default MARS ATM address which is needed to
           setup the initial signalling path between a MARS
           client and its associated MARS."
      ::= { marsClientEntry 3 }

marsClientHsn OBJECT-TYPE
    SYNTAX  Unsigned32
    MAX-ACCESS read-create
      STATUS   current
      DESCRIPTION
          "The cluster membership own 32 bit Host Sequence
           Number.  When a new cluster member starts up, it is
           initialized to zero.  When the cluster member sends
           the MARS_JOIN to register, the HSN will be correctly
           set to the current cluster sequence number (CSN) when
           the Client receives the copy of its MARS_JOIN from
           the MARS.  It is is used to track the MARS sequence
           number."
      ::= { marsClientEntry 4 }

marsClientRegistration OBJECT-TYPE
    SYNTAX   INTEGER {
        notRegistered (1),
        registering (2),
        registered (3),
        reRegisteringFault (4),
```

```
              reRegisteringRedirMap (5)
          }
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "An indication with regards to the registration
          status of this client. The registration codes
          of 'notRegistered (1)', 'registered (2)', and
          registered (3) are self-explanatory. The
          'reRegisteringFault (4)' indicates the client is
          in the process of re-registering with a MARS due
          to some fault conditions.  The 'reRegisteringRedMap
          (5)' status code shows that client is re-registering
          because it has received a MARS_REDIRECT_MAP message
          and was told to register with a different MARS from
          the current MARS."
     ::= { marsClientEntry 5 }

 marsClientCmi OBJECT-TYPE
     SYNTAX  INTEGER (0..65535)
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "16 bit Cluster member identifier (CMI) assigned by the
          MARS which uniquely identifies each endpoint attached
          to the cluster.  The value becomes valid after the
          'marsClientRegistration' is set to the value
          of 'registered (1)'."
     ::= { marsClientEntry 6 }

 marsClientDefaultMtu OBJECT-TYPE
     SYNTAX  INTEGER (1..65535)
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "The default maximum transmission unit (MTU) used for
          this cluster.  Note that the actual size used for a
          VC between two members of the cluster may be negotiated
          during connection setup and may be different than this
          value.  Default value = 9180 bytes."
     DEFVAL { 9180 }
     ::= { marsClientEntry 7 }

 marsClientFailureTimer OBJECT-TYPE
     SYNTAX  INTEGER (1..2147483647)
     UNITS   "seconds"
     MAX-ACCESS read-create
     STATUS  current
```

```
     DESCRIPTION
         "A timer used to flag the failure of last MARS_MULTI
          to arrive.  Default value = 10 seconds (recommended)."
     DEFVAL { 10 }
     ::= { marsClientEntry 8 }

 marsClientRetranDelayTimer OBJECT-TYPE
     SYNTAX  INTEGER (5..10)
     UNITS   "seconds"
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "The delay timer for sending out new MARS_REQUEST
          for the group after the client learned that there
          is no other group in the cluster.  The timer must
          be set between 5 and 10 seconds inclusive."
     ::= { marsClientEntry 9 }

 marsClientRdmMulReqAddRetrTimer OBJECT-TYPE
     SYNTAX  INTEGER (5..10)
     UNITS   "seconds"
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "The initial random L_MULTI_RQ/ADD retransmit timer
          which can be set between 5 and 10 seconds inclusive."
     ::= { marsClientEntry 10 }

 marsClientRdmVcRevalidateTimer OBJECT-TYPE
     SYNTAX  INTEGER (1..10)
     UNITS   "seconds"
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "The random time to set VC_revalidate flag.  The
          timer value ranges between 1 and 10 seconds
          inclusive."
     ::= { marsClientEntry 11 }

 marsClientJoinLeaveRetrInterval OBJECT-TYPE
     SYNTAX  INTEGER(5..2147483647)
     UNITS   "seconds"
     MAX-ACCESS read-create
     STATUS  current
     DESCRIPTION
         "MARS_JOIN/LEAVE retransmit interval. The minimum
          and recommended values are 5 and 10 seconds,
          respectively."
```

```
        DEFVAL { 10 }
        ::= { marsClientEntry 12 }

   marsClientJoinLeaveRetrLimit OBJECT-TYPE
        SYNTAX  INTEGER (0..5)
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "MARS_JOIN/LEAVE retransmit limit. The maximum
             value is 5."
        ::= { marsClientEntry 13 }

   marsClientRegWithMarsRdmTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..10)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Random time to register with MARS."
        ::= { marsClientEntry 14 }

   marsClientForceWaitTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..2147483647)
        UNITS   "minutes"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Force wait if MARS re-registration is looping.
             The minimum value is 1 minute."
        ::= { marsClientEntry 15 }

   marsClientLmtToMissRedirMapTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..4)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Timer limit for client to miss MARS_REDIRECT_MAPS."
        ::= { marsClientEntry 16 }

   marsClientIdleTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..2147483647)
        UNITS   "minutes"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
```

```
             "The configurable inactivity timer associated with a
              client. When a VC is created at this client, it gets
              the idle timer value from this configurable timer.
              The minimum suggested value is 1 minute and the
              recommended default value is 20 minutes."
         DEFVAL { 20 }
         ::= { marsClientEntry 17 }

    marsClientRowStatus OBJECT-TYPE
         SYNTAX   RowStatus
         MAX-ACCESS read-create
         STATUS   current
         DESCRIPTION
             "The object is used to create, delete or modify a
              row in this table.

              A row cannot be made 'active' until instances of
              all corresponding columns in the row of this table
              are appropriately configured and until the agent
              has also created a corresponding row in the
              marsClientStatTable.

              When this object has a value of 'active', the
              following columnar objects can not be modified:

                marsClientDefaultMarsAddr,
                marsClientHsn,
                marsClientRegstration,
                marsClientCmi,
                marsClientDefaultMtu

              while other objects in this conceptual row can be
              modified irrespective of the value of this object.

              Deletion of this row is allowed regardless of
              whether or not a row in any associated tables
              (i.e., marsClientVcTable) still exists or is in
              use. Once this row is deleted, it is recommended
              that the agent or the SNMP management station
              (if possible) through the set command deletes
              any stale rows that are associated with this
              row."
         ::= { marsClientEntry 18 }

    --**************************************************************
    -- IP ATM MARS Client Multicast Group Address Object Definitions
    --**************************************************************
```

```
marsClientMcGrpTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF MarsClientMcGrpEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table contains a list of IP multicast group address
         blocks associated with a MARS client.  Entries in this
         table are used by the client that needs to receive or
         transmit packets from/to the specified range of
         multicast addresses.
         Each row can be created or deleted via configuration."
    ::= {  marsClientObjects 2 }

marsClientMcGrpEntry OBJECT-TYPE
    SYNTAX  MarsClientMcGrpEntry
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Each entry represents a consecutive block of multicast
         group addresses."
    INDEX { ipAdEntAddr,
            marsClientIndex,
            marsClientMcMinGrpAddr,
            marsClientMcMaxGrpAddr }
    ::= { marsClientMcGrpTable 1 }

MarsClientMcGrpEntry ::=
    SEQUENCE {
        marsClientMcMinGrpAddr          IpAddress,
        marsClientMcMaxGrpAddr          IpAddress,
        marsClientMcGrpRowStatus        RowStatus
    }

marsClientMcMinGrpAddr OBJECT-TYPE
    SYNTAX  IpAddress
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Minimum multicast group address - the min and max
         multicast forms multi-group block.  If the MinGrpAddr
         and MaxGrpAddr are the same, it indicates that this
         block contains a single group address."
    ::= { marsClientMcGrpEntry 1 }

marsClientMcMaxGrpAddr OBJECT-TYPE
    SYNTAX  IpAddress
    MAX-ACCESS not-accessible
    STATUS  current
```

         DESCRIPTION
             "Maximum multicast group address - the min and max
              multicast forms a multi-group block. If the MinGrpAddr
              and MaxGrpAddr are the same, it indicates that this
              block contains a single group address."
         ::= { marsClientMcGrpEntry 2 }

     marsClientMcGrpRowStatus OBJECT-TYPE
         SYNTAX   RowStatus
         MAX-ACCESS read-create
         STATUS   current
         DESCRIPTION
             "The object is used to create or delete a row in this
              table.

              Since other objects in this row are not-accessible
              'index-objects', the value of this object has no
              effect on whether those objects in this conceptual
              row can be modified."
         ::= { marsClientMcGrpEntry 3 }

     --***
     -- IP ATM MARS Client Backup MARS Object Definitions
     --***

     marsClientBackupMarsTable OBJECT-TYPE
         SYNTAX   SEQUENCE OF MarsClientBackupMarsEntry
         MAX-ACCESS not-accessible
         STATUS current
         DESCRIPTION
             "This table contains a list of backup MARS addresses that
              a client can connect to in case of failure for connecting
              to the primary server. The list of addresses is in
              descending order of preference. It should be noted that
              the backup list provided by the MARS to the client via
              the MARS_REDIRECT_MAP message has a higher preference than
              addresses that are manually configured into the client.
              When such a list is received from the MARS, this information
              should be inserted at the top of the list.
              Each row can be created or deleted via configuration."
         ::= { marsClientObjects 3 }

     marsClientBackupMarsEntry OBJECT-TYPE
         SYNTAX   MarsClientBackupMarsEntry
         MAX-ACCESS not-accessible
         STATUS   current
         DESCRIPTION
             "Each entry represent an ATM address of a backup MARS."

```
        INDEX { ipAdEntAddr,
                marsClientIndex,
                marsClientBackupMarsPriority,
                marsClientBackupMarsAddr }
        ::= { marsClientBackupMarsTable 1 }

    MarsClientBackupMarsEntry ::=
        SEQUENCE {
            marsClientBackupMarsPriority     Unsigned32,
            marsClientBackupMarsAddr         AtmAddr,
            marsClientBackupMarsRowStatus    RowStatus
        }

    marsClientBackupMarsPriority OBJECT-TYPE
        SYNTAX   Unsigned32(0..65535)
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "The priority associated with a backup MARS. A lower
             priority value inidcates a higher preference."
        ::= { marsClientBackupMarsEntry 1 }

    marsClientBackupMarsAddr OBJECT-TYPE
        SYNTAX   AtmAddr
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "The ATM address associated with a backup MARS."
        ::= { marsClientBackupMarsEntry 2 }

    marsClientBackupMarsRowStatus OBJECT-TYPE
        SYNTAX   RowStatus
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "The object is used to create or delete a row in this
             table.

             Since other objects in this row are not-accessible
             'index-objects', the value of this object has no effect
             on whether those objects in this conceptual row can be
             modified."
        ::= { marsClientBackupMarsEntry 3 }

    --*****************************************************************
    --  IP ATM MARS Client VC Object Definition Table
    --*****************************************************************
```

```
   marsClientVcTable OBJECT-TYPE
       SYNTAX  SEQUENCE OF MarsClientVcEntry
       MAX-ACCESS  not-accessible
       STATUS current
       DESCRIPTION
           "This table contains information about open virtual
            circuits (VCs) that a client has.  For point to point
            circuit, each entry represents a single VC connection
            between this client ATM address to another party ATM
            address.  In the case of point to multipoint connection
            where a single source address is associated with
            multiple destinations, several entries are used to
            represent the relationship.  An example of point to
            multi-point VC represented in a table is shown below.

                  Client    VPI/VCI    Grp Addr1/Addr2    Part Addr
                    1         0,1          g1,g2              p1
                    1         0,1          g1,g2              p2
                    1         0,1          g1,g2              p3

           Note:  This table assumes the IP multicast address
                  groups (min, max) defined in each entry are
                  always consecutive.  In the case of that a
                  client receives a JOIN/LEAVE with
                  mars$flag.punched set, each pair of the IP
                  groups will first be broken into several
                  pairs of consecutive IP groups before each
                  entry row corresponding to a pair of IP group
                  is created."
       ::= { marsClientObjects 4 }

   marsClientVcEntry OBJECT-TYPE
       SYNTAX  MarsClientVcEntry
       MAX-ACCESS not-accessible
       STATUS  current
       DESCRIPTION
           "The objects contained in the entry are VC related
            attributes such as VC signalling type, control VC
            type, idle timer, negotiated MTU size, etc."
       INDEX { ipAdEntAddr,
               marsClientIndex,
               marsClientVcVpi,
               marsClientVcVci,
               marsClientVcMinGrpAddr,
               marsClientVcMaxGrpAddr,
               marsClientVcPartyAddr }
       ::= { marsClientVcTable 1 }
```

```
    MarsClientVcEntry ::=
        SEQUENCE {
            marsClientVcVpi            INTEGER,
            marsClientVcVci            INTEGER,
            marsClientVcMinGrpAddr     IpAddress,
            marsClientVcMaxGrpAddr     IpAddress,
            marsClientVcPartyAddr      AtmAddr,
            marsClientVcPartyAddrType  INTEGER,
            marsClientVcType           INTEGER,
            marsClientVcCtrlType       INTEGER,
            marsClientVcIdleTimer      INTEGER,
            marsClientVcRevalidate     TruthValue,
            marsClientVcEncapsType     INTEGER,
            marsClientVcNegotiatedMtu  INTEGER,
            marsClientVcRowStatus      RowStatus
        }

    marsClientVcVpi OBJECT-TYPE
        SYNTAX   INTEGER (0..4095)
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "The value of virtual path identifier (VPI). Since
             a VPI can be numbered 0, this sub-index can take
             a value of 0."
        ::= { marsClientVcEntry 1 }

    marsClientVcVci OBJECT-TYPE
        SYNTAX   INTEGER (0..65535)
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "The value of virtual circuit identifier (VCI). Since
             a VCI can be numbered 0, this sub-index can take
             a value of 0."
        ::= { marsClientVcEntry 2 }

    marsClientVcMinGrpAddr OBJECT-TYPE
        SYNTAX   IpAddress
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "Minimum IP multicast group address - the min and
             max multicast forms a multi-group consecutive
             block which is associated with a table entry.
             if the MinGrpAddr and MaxGrpAddr are the same, it
             indicates that the size of multi-group block is 1,
             a single IP group."
```

```
        ::= { marsClientVcEntry 3 }

   marsClientVcMaxGrpAddr OBJECT-TYPE
       SYNTAX   IpAddress


       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "Maximum IP multicast group address - the min and
            max multicast forms a multi-group consecutive
            block which is associated with a table entry.
            if the MinGrpAddr and MaxGrpAddr are the same, it
            indicates that the size of multi-group block is 1,
            a single IP group."
       ::= { marsClientVcEntry 4 }

   marsClientVcPartyAddr OBJECT-TYPE
       SYNTAX   AtmAddr
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "An ATM party address in which this VC is linked.
            The party type is identified by the
            marsClientVcPartyAddrType."
       ::= { marsClientVcEntry 5 }

   marsClientVcPartyAddrType OBJECT-TYPE
       SYNTAX   INTEGER {
             called (1),
             calling (2)
           }
       MAX-ACCESS read-create
       STATUS   current
       DESCRIPTION
           "The party type is associated with the party address.
            The 'called (1)' indicates that the party address is
            a destination address which implies that VC is
            originated from this client.  The 'calling (2)'
            indicates the VC was initiated externally to this
            client. In this case, the party address is the
            source address."
       ::= { marsClientVcEntry 6 }

   marsClientVcType OBJECT-TYPE
       SYNTAX   INTEGER {
             pvc (1),
             svc (2)
```

```
            }
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Circuit Connection type: permanent virtual circuit or
             switched virtual circuit."
        ::= { marsClientVcEntry 7 }

    marsClientVcCtrlType OBJECT-TYPE
        SYNTAX  INTEGER {
                pointToPointVC (1),
                clusterControlVC (2),
                pointToMultiPointVC (3)
            }
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Control VC type used to specify a particular connection.
                pointToPointVC (1):
                  used by the ATM Clients for the registration and
                  queries.  This VC or the initial signalling path
                  is set up from the source Client to a MARS. It is
                  bi-directional.
                clusterControlVC (2):
                  used by a MARS to issue asynchronous updates to an
                  ATM Client.  This VC is established from the MARS
                  to the ATM Client.
                pointToMultiPointVC (3):
                  used by the client to transfer multicast data
                  packets from layer 3.  This VC is established
                  from the source ATM Client to a destination ATM
                  endpoint which can be a multicast group member
                  or an MCS.  The destination endpoint was obtained
                  from the MARS."
        ::= { marsClientVcEntry 8 }

    marsClientVcIdleTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..2147483647)
        UNITS   "minutes"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The idle timer associated with this VC.  The minimum
             suggested value is 1 minute and the recommended
             default value is 20 minutes."
        DEFVAL { 20 }
        ::= { marsClientVcEntry 9 }
```

```
marsClientVcRevalidate OBJECT-TYPE
    SYNTAX  TruthValue
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "A flag associated with an open and active multipoint
         VC.  It is checked every time a packet is queued for
         transmission on that VC. The object has the value of
         true (1) if revalidate is required and the value
         false (2) otherwise."
    ::= { marsClientVcEntry 10 }

 marsClientVcEncapsType OBJECT-TYPE
    SYNTAX  INTEGER {
         other (1),
         llcSnap (2)
        }
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "The encapsulation type used when communicating over
         this VC."
    ::= { marsClientVcEntry 11 }

marsClientVcNegotiatedMtu OBJECT-TYPE
    SYNTAX  INTEGER (1..65535)
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "The negotiated MTU when communicating over this VC."
    ::= { marsClientVcEntry 12 }

marsClientVcRowStatus OBJECT-TYPE
    SYNTAX  RowStatus
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "The object is used to create, delete or modify a
         row in this table.

         A row cannot be made 'active' until instances of
         all corresponding columns in the row of this table
         are appropriately configured.

         While objects: marsClientVcIdleTimer and
         marsClientVcRevalidate in this conceptual
         row can be modified irrespective of the value
         of this object, all other objects in the row can
```

```
            not be modified when this object has a value
            of 'active'.

            It is possible for an SNMP management station
            to set the row to 'notInService' and modify
            the entry and then set it back to 'active'

            with the following exception. That is, rows
            for which the corresponding instance of
            marsClientVcType has a value of 'svc' can not
            be modified or deleted."
        ::= { marsClientVcEntry 13 }

    --*****************************************************************
    --   IP ATM MARS Client Statistic Object Definition Table
    --*****************************************************************

    marsClientStatTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF MarsClientStatEntry
        MAX-ACCESS  not-accessible
        STATUS current
        DESCRIPTION
            "The table contains statistics collected at MARS
             clients."
        ::= { marsClientObjects 5 }

    marsClientStatEntry OBJECT-TYPE
        SYNTAX  MarsClientStatEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "Each entry contains statistics collected at one MARS
             client."
        INDEX { ipAdEntAddr, marsClientIndex }
        ::= { marsClientStatTable 1 }

    MarsClientStatEntry ::=
        SEQUENCE {
            marsClientStatTxReqMsgs        Counter32,
            marsClientStatTxJoinMsgs       Counter32,
            marsClientStatTxLeaveMsgs      Counter32,
            marsClientStatTxGrpLstReqMsgs  Counter32,
            marsClientStatRxJoinMsgs       Counter32,
            marsClientStatRxLeaveMsgs      Counter32,
            marsClientStatRxMultiMsgs      Counter32,
            marsClientStatRxNakMsgs        Counter32,
            marsClientStatRxMigrateMsgs    Counter32,
            marsClientStatRxGrpLstRplyMsgs Counter32,
```

```
            marsClientStatFailMultiMsgs     Counter32
        }

    marsClientStatTxReqMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_REQUEST messages transmitted
             from a client."
        ::= { marsClientStatEntry 1 }

    marsClientStatTxJoinMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_JOIN messages transmitted from
             a client."
        ::= { marsClientStatEntry 2 }

    marsClientStatTxLeaveMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_LEAVE messages transmitted from
             a client."
        ::= { marsClientStatEntry 3 }

    marsClientStatTxGrpLstReqMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_GROUPLIST_REQUEST messages
             transmitted from a client."
        ::= { marsClientStatEntry 4 }

    marsClientStatRxJoinMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_JOIN messages received by
             a client."
        ::= { marsClientStatEntry 5 }
```

```
marsClientStatRxLeaveMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_LEAVE messages received by
         a client."
    ::= { marsClientStatEntry 6 }

marsClientStatRxMultiMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_MULTI messages received by
         a client."
    ::= { marsClientStatEntry 7 }

marsClientStatRxNakMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_NAK messages received by
         a client."
    ::= { marsClientStatEntry 8 }

marsClientStatRxMigrateMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_MIGRATE messages received by
         a client."
    ::= { marsClientStatEntry 9 }

    marsClientStatRxGrpLstRplyMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_GROUPLIST_REPLY messages
         received by a client."
    ::= { marsClientStatEntry 10 }

marsClientStatFailMultiMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
```

```
    STATUS  current
    DESCRIPTION
        "Total number of timeouts occurred indicating
         failure of the last MARS_MULTI to arrive."
    ::= { marsClientStatEntry 11 }

--*************************************************************
--  IP ATM MARS Object Definitions
--*************************************************************

marsObjects    OBJECT IDENTIFIER ::= { marsMIB 2 }

marsTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF MarsEntry
    MAX-ACCESS  not-accessible
    STATUS current
    DESCRIPTION
        "The objects defined in this table are used for the
         management of MARS servers."
    ::= {  marsObjects 1 }

marsEntry OBJECT-TYPE
    SYNTAX  MarsEntry
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Each entry contains a MARS and its associated
         attributes."
    INDEX { marsIndex, marsIfIndex }
    ::= { marsTable 1 }

MarsEntry ::=
    SEQUENCE {
        marsIndex               Integer32,
        marsIfIndex             InterfaceIndex,
        marsAddr                AtmAddr,
        marsLocal               TruthValue,
        marsServStatus          INTEGER,
        marsServType            INTEGER,
        marsServPriority        Unsigned32,
        marsRedirMapMsgTimer    INTEGER,
        marsCsn                 Unsigned32,
        marsSsn                 Unsigned32,
        marsRowStatus           RowStatus
    }

marsIndex OBJECT-TYPE
    SYNTAX  Integer32(1..65535)
```

```
       MAX-ACCESS not-accessible
       STATUS  current
       DESCRIPTION
           "The auxiliary variable used to identify instances of
            the columnar objects in the MARS table."
       ::= { marsEntry 1 }

   marsIfIndex OBJECT-TYPE
       SYNTAX  InterfaceIndex
       MAX-ACCESS not-accessible
       STATUS  current
       DESCRIPTION
           "The ifIndex of the interface that the MARS is
            associated with."
       ::= { marsEntry 2 }

   marsAddr OBJECT-TYPE
       SYNTAX  AtmAddr
       MAX-ACCESS read-create
       STATUS  current
       DESCRIPTION
           "The ATM address associated with the MARS."
       ::= { marsEntry 3 }

   marsLocal OBJECT-TYPE
       SYNTAX  TruthValue
       MAX-ACCESS read-create
       STATUS  current
       DESCRIPTION
           "A flag associated with a MARS entry.  The object has
            the value of true (1) if the MARS whose interface
            is local to the machine that implements this MIB;
            otherwise the object has the value of false (2)."
       ::= { marsEntry 4 }

   marsServStatus OBJECT-TYPE
       SYNTAX   INTEGER {
            active (1),
            inactive (2),
            faulted (3)
           }
       MAX-ACCESS read-create
       STATUS  current
       DESCRIPTION
           "The current status of MARS."
       ::= { marsEntry 5 }

   marsServType OBJECT-TYPE
```

```
        SYNTAX  INTEGER {
            primary (1),
            backup (2)
        }
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Types of MARS servers: primary or backup."
        ::= { marsEntry 6 }

    marsServPriority OBJECT-TYPE
        SYNTAX  Unsigned32(0..65535)
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Priority associated with a backup MARS server.
             A backup MARS server with lower priority value
             indicates a higher preference than other backup
             MARS servers to be used as the MARS server when
             the primary server fails."
        ::= { marsEntry 7 }

    marsRedirMapMsgTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..2)
        UNITS   "minutes"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Periodic interval on which a multi-part
             MARS_REDIRECT_MAP is sent from this MARS."
          DEFVAL { 1 }
        ::= { marsEntry 8 }

    marsCsn OBJECT-TYPE
        SYNTAX  Unsigned32
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Current cluster sequence number (CSN) which is global
             within the context of a given protocol.  The CSN is
             incremented by the MARS on every transmission of a
             message on ClusterControlVC.  A cluster member uses
             the CSN to track the message loss on ClusterControlVC
             or to monitor a membership change."
        ::= { marsEntry 9 }

    marsSsn OBJECT-TYPE
        SYNTAX  Unsigned32
```

```
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Current server sequence number (SSN) which is global
             within the context of a given protocol.  The SSN is
             incremented by the MARS on every transmission of a
             message on ServerControlVC.  A MCS uses the SSN to
             track the message loss on ServerControlVC or to
             monitor a membership change."
        ::= { marsEntry 10 }

    marsRowStatus OBJECT-TYPE
        SYNTAX  RowStatus
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The object is used to create, delete or modify a
             row in this table.

             A row cannot be made 'active' until instances of
             all corresponding columns in the row of this table
             are appropriately configured and until the agent
             has also created a corresponding row in the
             marsStatTable.

             When this object has a value of 'active', the
             following columnar objects can not be modified:

               marsAddr,
               marsAddrLocal,
               marsServStatus,
               marsServType,
               marsCsn,
               marsSsn

             while other objects in this conceptual row can be
             modified irrespective of the value of this object.

             Deletion of this row is allowed regardless of
             whether or not a row in any associated tables
             (i.e., marsVcTable) still exists or is in use.
             Once this row is deleted, it is recommended that
             the agent or the SNMP management station (if
             possible) through the set command deletes any
             stale rows that are associated with this row."
        ::= { marsEntry 11 }
```

```
   --****************************************************************
   -- IP ATM MARS Multicast Group Address Object Definitions
   --****************************************************************

   marsMcGrpTable OBJECT-TYPE
       SYNTAX   SEQUENCE OF MarsMcGrpEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
           "This table contains a list of IP multicast address
            blocks associated with a MARS.  Entries in this table
            are used by the MARS host map table and the server map
            table.  They should be created prior to being referenced
            as indices by those tables.
            Each row can be created or deleted via configuration."
       ::= { marsObjects 2 }

   marsMcGrpEntry OBJECT-TYPE
       SYNTAX   MarsMcGrpEntry
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "Each entry represents a consecutive block of multicast
            group addresses."
       INDEX { marsIndex,
               marsIfIndex,
               marsMcMinGrpAddr,
               marsMcMaxGrpAddr }
       ::= { marsMcGrpTable 1 }

   MarsMcGrpEntry ::=
       SEQUENCE {
           marsMcMinGrpAddr            IpAddress,
           marsMcMaxGrpAddr            IpAddress,
           marsMcGrpAddrUsage          INTEGER,
           marsMcGrpRxLayer3GrpSets    Counter32,
           marsMcGrpRxLayer3GrpResets  Counter32,
           marsMcGrpRowStatus          RowStatus
       }

   marsMcMinGrpAddr OBJECT-TYPE
       SYNTAX   IpAddress
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "Minimum multicast group address - the min and max
            multicast forms multi-group block.  If the MinGrpAddr
            and MaxGrpAddr are the same, it indicates that this
```

```
        block contains a single group address."
    ::= { marsMcGrpEntry 1 }

marsMcMaxGrpAddr OBJECT-TYPE
    SYNTAX   IpAddress
    MAX-ACCESS not-accessible
    STATUS   current
    DESCRIPTION
        "Maximum multicast group address - the min and max
         multicast forms a multi-group block.  If The
         MinGrpAddr and MaxGrpAddr are the same, it indicates
         that this block contains a single group address."
    ::= { marsMcGrpEntry 2 }

marsMcGrpAddrUsage OBJECT-TYPE
    SYNTAX   INTEGER {
          hostMap (1),
          serverMap (2),
          hostServerMap (3)
        }
    MAX-ACCESS read-create
    STATUS   current
    DESCRIPTION
        "Usage of the multicast address block.  The hostMap (1)
         indicates that the address block is only used in the
         MARS host map table. The serverMap (2) indicates
         that the address block is only used in the MARS
         server map table.  The hostServerMap (3) indicates
         that the address block is used in both the host map
         and the server map tables."
    ::= { marsMcGrpEntry 3 }

marsMcGrpRxLayer3GrpSets OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Number of MARS_JOIN messages received with
         mars$flags.layer3grp flag set."
    ::= { marsMcGrpEntry 4 }

marsMcGrpRxLayer3GrpResets OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Number of MARS_JOIN messages received with
         mars$flags.layer3grp flag reset."
```

```
       ::= { marsMcGrpEntry 5 }

   marsMcGrpRowStatus OBJECT-TYPE
       SYNTAX   RowStatus
       MAX-ACCESS read-create
       STATUS   current
       DESCRIPTION
           "The object is used to create, delete or modify a
            row in this table.

            The value of this object has no effect on whether
            other objects in this conceptual row can be modified."
       ::= { marsMcGrpEntry 6 }

   --*************************************************************
   --   IP ATM MARS Host Map Object Definitions
   --*************************************************************

   marsHostMapTable OBJECT-TYPE
       SYNTAX   SEQUENCE OF MarsHostMapEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
           "This table caches mappings between IP multicast
            address to a list of ATM addresses that are
            configured or dynamically learned from the MARS.
            This address resolution is used for the host map.
            It supports the mapping of a block of multicast
            group addresses to a cluster member address.  In
            the case where a group block is associated with
            multiple cluster members, several entries are
            used to representing the relationship."
       ::= { marsObjects 3 }

   marsHostMapEntry OBJECT-TYPE
       SYNTAX   MarsHostMapEntry
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "Each entry row contains attributes associated with
            the mapping between a multicast group block and an
            ATM address."
       INDEX { marsIndex,
               marsIfIndex,
               marsMcMinGrpAddr,
               marsMcMaxGrpAddr,
               marsHostMapAtmAddr }
       ::= { marsHostMapTable 1 }
```

```
MarsHostMapEntry ::=
    SEQUENCE {
        marsHostMapAtmAddr       AtmAddr,
        marsHostMapRowType       INTEGER,
        marsHostMapRowStatus     RowStatus
    }

marsHostMapAtmAddr OBJECT-TYPE
    SYNTAX   AtmAddr
    MAX-ACCESS not-accessible
    STATUS   current
    DESCRIPTION
        "The mapped cluster member ATM address."
    ::= { marsHostMapEntry 1 }

marsHostMapRowType OBJECT-TYPE
    SYNTAX   INTEGER {
            static (1),
            dynamic (2)
        }
    MAX-ACCESS read-create
    STATUS   current
    DESCRIPTION
        "Method in which this entry row is created. The
         static (1) indicates that this row is created
         through configuration.  The dynamic (2) indicates
         that the row is created as the result of group
         address updates received at this MARS."
    ::= { marsHostMapEntry 2 }

marsHostMapRowStatus OBJECT-TYPE
    SYNTAX   RowStatus
    MAX-ACCESS read-create
    STATUS   current
    DESCRIPTION
        "The object is used to create, delete or modify a
         row in this table.

         This object must not be set to 'active' until
         instances of all corresponding columns in the
         row of this table are appropriately configured.

         It is possible for an SNMP management station
         to set the row to 'notInService' and modify
         the entry and then set it back to 'active'
         with the following exception. That is, rows
         for which the corresponding instance of
         marsHostMapRowType has a value of 'dynamic'
```

```
            can not be modified or deleted."
        ::= { marsHostMapEntry 3 }


    --*************************************************************
    --  IP ATM MARS Server Map Object Definitions
    --*************************************************************

    marsServerMapTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF MarsServerMapEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "This table caches mappings between IP multicast
             address to a list of MCS ATM addresses that are
             configured or dynamically learned from the MARS.
             This address resolution is used for the server map.
             It supports the mapping of a block of multicast
             group addresses to a MCS address.  In the case
             where a group block is associated with multiple
             MCSs, several entries are used to representing the
             relationship."
        ::= { marsObjects 4 }

    marsServerMapEntry OBJECT-TYPE
        SYNTAX   MarsServerMapEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "Each entry row contains attributes associated with
             the mapping between a multicast group block and an
             MCS address."
        INDEX { marsIndex,
                marsIfIndex,
                marsMcMinGrpAddr,
                marsMcMaxGrpAddr,
                marsServerMapAtmAddr }
        ::= { marsServerMapTable 1 }

    MarsServerMapEntry ::=
        SEQUENCE {
            marsServerMapAtmAddr   AtmAddr,
            marsServerMapRowType   INTEGER,
            marsServerMapRowStatus RowStatus
        }

    marsServerMapAtmAddr OBJECT-TYPE
        SYNTAX   AtmAddr
        MAX-ACCESS not-accessible
```

```
        STATUS  current
        DESCRIPTION
            "The mapped MCS ATM address."
        ::= { marsServerMapEntry 1 }

    marsServerMapRowType OBJECT-TYPE
        SYNTAX  INTEGER {
                static (1),
                dynamic (2)
              }
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Method in which this entry row is created. The
             'static (1)' indicates that this row is created
             through configuration.  The 'dynamic (2)' indicates
             that the row is created as the result of group
             address updates received at this MARS."
        ::= { marsServerMapEntry 2 }

    marsServerMapRowStatus OBJECT-TYPE
        SYNTAX  RowStatus
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The object is used to create, delete or modify a
             row in this table.

             This object must not be set to 'active' until
             instances of all corresponding columns in the
             row of this table are appropriately configured.

             It is possible for an SNMP management station
             to set the row to 'notInService' and modify
             the entry and then set it back to 'active'
             with the following exception. That is, rows
             for which the corresponding instance of
             marsServerMapRowType has a value of 'dynamic'
             can not be modified or deleted."
        ::= { marsServerMapEntry 3 }

    --***************************************************************
    --  IP ATM MARS VC Object Definition Table
    --***************************************************************

    marsVcTable OBJECT-TYPE
        SYNTAX  SEQUENCE OF MarsVcEntry
        MAX-ACCESS  not-accessible
```

           STATUS current
           DESCRIPTION
               "This table contains information about open virtual circuits
                (VCs) that a MARS has. For point to point circuit, each
                entry represents a single VC connection between this MARS
                ATM address to another party's ATM address. In the case of
                point to multipoint connection where a ControlVc is attached
                with multiple leaf nodes, several entries are used to
                represent the relationship. An example of point to
                multi-point VC represented in a table is shown below.

                    MARS   VPI/VCI   MARS Addr   Party Addr
                      1   0,1   m1   p1
                      1   0,1   m1   p2
                      1   0,1   m1   p3"
           ::= { marsObjects 5 }

    marsVcEntry OBJECT-TYPE
        SYNTAX MarsVcEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "The objects contained in the entry are VC related attributes
             such as VC signalling type, control VC type, idle timer,
             negotiated MTU size, etc."
        INDEX { marsIndex,
               marsIfIndex,
               marsVcVpi,
               marsVcVci,
               marsVcPartyAddr }
        ::= { marsVcTable 1 }

    MarsVcEntry ::=
        SEQUENCE {
            marsVcVpi   INTEGER,
            marsVcVci   INTEGER,
            marsVcPartyAddr   AtmAddr,
            marsVcPartyAddrType   INTEGER,
            marsVcType   INTEGER,
            marsVcCtrlType   INTEGER,
            marsVcIdleTimer   INTEGER,
            marsVcCmi   INTEGER,
            marsVcEncapsType   INTEGER,
            marsVcNegotiatedMtu   INTEGER,
            marsVcRowStatus   RowStatus
           }

    marsVcVpi OBJECT-TYPE

```
    SYNTAX  INTEGER (0..4095)
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The value of virtual path identifier (VPI). Since
         a VPI can be numbered 0, this sub-index can take
         a value of 0."
    ::= { marsVcEntry 1 }

marsVcVci OBJECT-TYPE
    SYNTAX  INTEGER (0..65535)
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The value of virtual circuit identifier (VCI).
         Since a VCI can be numbered 0, this sub-index
         can take a value of 0."
    ::= { marsVcEntry 2 }

marsVcPartyAddr OBJECT-TYPE
    SYNTAX  AtmAddr
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "An ATM party address in which this VC is linked. The
         party type is identified by the marsVcPartyAddrType."
    ::= { marsVcEntry 5 }

marsVcPartyAddrType OBJECT-TYPE
    SYNTAX  INTEGER {
            called (1),
            calling (2)
          }
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "The party type is associated with the party address.  The
         'called (1)' indicates that the party address is a
         destination address which implies that VC is originated
         from this MARS. The 'calling (2)' indicates the VC was
         initiated externally to this MARS.  The party address is
         the source address."
    ::= { marsVcEntry 6 }

marsVcType OBJECT-TYPE
    SYNTAX  INTEGER {
            pvc (1),
            svc (2)
```

```
                }
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "Circuit Connection type: permanent virtual circuit or
             switched virtual circuit."
        ::= { marsVcEntry 7 }

    marsVcCtrlType OBJECT-TYPE
        SYNTAX   INTEGER {
                pointToPointVC (1),
                clusterControlVC (2),
                serverControlVC (3)
            }
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "Control VC type used to specify a particular connection.
                pointToPointVC (1):
                  used by the ATM endpoints (clients) or the MCS for
                  registration and queries.  This VC is set up from
                  a MARS client and MCS to this MARS.  It is a
                  bi-directional VC.
                clusterControlVC (2):
                  used by MARS to issue asynchronous updates to ATM
                  an ATM client.  This VC is established from the
                  MARs to the ATM client.
                serverControlVC (3):
                  used by MARS to issue asynchronous update to ATM
                  multicast servers.  This type of VC exists when at
                  least a MCS is being used."
        ::= { marsVcEntry 8 }

    marsVcIdleTimer OBJECT-TYPE
        SYNTAX   INTEGER (1..2147483647)
        UNITS    "minutes"
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "The idle timer associated with this VC.  The minimum
             suggested value is 1 minute and the recommended default
             value is 20 minutes."
        DEFVAL { 20 }
        ::= { marsVcEntry 9 }

    marsVcCmi OBJECT-TYPE
        SYNTAX   INTEGER (0..65535)
        MAX-ACCESS read-create
```

```
       STATUS  current
       DESCRIPTION
           "Cluster member identifier (CMI) which uniquely identifies
            each endpoint attached to the cluster.  This variable
            applies to each 'leaf node' of an outgoing control VC."
       ::= { marsVcEntry 10 }

   marsVcEncapsType OBJECT-TYPE
       SYNTAX  INTEGER {
             other (1),
             llcSnap (2)
           }
       MAX-ACCESS read-create
       STATUS  current
       DESCRIPTION
           "The encapsulation type used when communicating over
            this VC."
       ::= { marsVcEntry 11 }

   marsVcNegotiatedMtu OBJECT-TYPE
       SYNTAX  INTEGER (1..65535)
       MAX-ACCESS read-create
       STATUS  current
       DESCRIPTION
           "The negotiated MTU when communicating over this VC."
       ::= { marsVcEntry 12 }

   marsVcRowStatus OBJECT-TYPE
       SYNTAX  RowStatus
       MAX-ACCESS read-create
       STATUS  current
       DESCRIPTION
           "The object is used to create, delete or modify a
            row in this table.

            A row cannot be made 'active' until instances of
            all corresponding columns in the row of this table
            are appropriately configured.

            While the marsVcIdleTimer in this conceptual
            row can be modified irrespective of the value
            of this object, all other objects in the row can
            not be modified when this object has a value
            of 'active'.

            It is possible for an SNMP management station
            to set the row to 'notInService' and modify
            the entry and then set it back to 'active'
```

```
        with the following exception. That is, rows
        for which the corresponding instance of
        marsVcType has a value of 'svc' can not be
        modified or deleted."
    ::= { marsVcEntry 13 }


   --****************************************************************
   --   IP ATM MARS Registered Cluster Member List Table
   --****************************************************************

   marsRegClientTable OBJECT-TYPE
       SYNTAX   SEQUENCE OF MarsRegClientEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
           "This table contains ATM identities of all the currently
            registered cluster members at a MARS.  Each entry represents
            one set of ATM identities associated with one cluster member
            or the MARS client."
       ::= { marsObjects 6 }

   marsRegClientEntry OBJECT-TYPE
       SYNTAX  MarsRegClientEntry
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "Each entry row contains attributes associated with one
            register cluster member."
       INDEX { marsIndex,
               marsIfIndex,
               marsRegClientCmi}
       ::= { marsRegClientTable 1 }

   MarsRegClientEntry ::=
       SEQUENCE {
           marsRegClientCmi        INTEGER,
           marsRegClientAtmAddr    AtmAddr
       }

   marsRegClientCmi OBJECT-TYPE
       SYNTAX   INTEGER (0..65535)
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "This cluster member identifier is used as an auxiliary index
            for the entry in this table."
       ::= { marsRegClientEntry 1 }
```

```
    marsRegClientAtmAddr OBJECT-TYPE
        SYNTAX  AtmAddr
        MAX-ACCESS read-only
        STATUS  current
        DESCRIPTION
            "The registered client's ATM address."
        ::= { marsRegClientEntry 2 }


    --*************************************************************
    --  IP ATM MARS Registered Server Member List Table
    --*************************************************************

    marsRegMcsTable OBJECT-TYPE
        SYNTAX  SEQUENCE OF MarsRegMcsEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "This table contains ATM identities of all the currently
             registered MCSs at a MARS. Each entry represents one set
             of ATM identities associated with one MCS."
        ::= { marsObjects 7 }

    marsRegMcsEntry OBJECT-TYPE
        SYNTAX  MarsRegMcsEntry
        MAX-ACCESS not-accessible
        STATUS  current
        DESCRIPTION
            "Each entry row contains attributes associated with one
             registered MCS."
        INDEX { marsIndex,
                marsIfIndex,
                marsRegMcsAtmAddr
              }
        ::= { marsRegMcsTable 1 }

    MarsRegMcsEntry ::=
        SEQUENCE {
            marsRegMcsAtmAddr  AtmAddr
        }

    marsRegMcsAtmAddr OBJECT-TYPE
        SYNTAX  AtmAddr
        MAX-ACCESS read-only
        STATUS  current
        DESCRIPTION
            "The registered MCS's ATM address."
        ::= { marsRegMcsEntry 1 }
```

```
      --***************************************************************
      --  IP ATM MARS Statistics Object Definition Table
      --***************************************************************

      marsStatTable OBJECT-TYPE
          SYNTAX  SEQUENCE OF MarsStatEntry
          MAX-ACCESS not-accessible
          STATUS current


          DESCRIPTION
              "The table contains statistics collected at MARS."
          ::= {  marsObjects 8 }

      marsStatEntry OBJECT-TYPE
          SYNTAX  MarsStatEntry
          MAX-ACCESS not-accessible
          STATUS  current
          DESCRIPTION
              "Each entry contains statistics collected at one MARS."
          INDEX { marsIndex, marsIfIndex }
          ::= { marsStatTable 1 }

      MarsStatEntry ::=
          SEQUENCE {
              marsStatTxMultiMsgs         Counter32,
              marsStatTxGrpLstRplyMsgs    Counter32,
              marsStatTxRedirectMapMsgs   Counter32,
              marsStatTxMigrateMsgs       Counter32,
              marsStatTxNakMsgs           Counter32,
              marsStatTxJoinMsgs          Counter32,
              marsStatTxLeaveMsgs         Counter32,
              marsStatTxSjoinMsgs         Counter32,
              marsStatTxSleaveMsgs        Counter32,
              marsStatTxMservMsgs         Counter32,
              marsStatTxUnservMsgs        Counter32,
              marsStatRxReqMsgs           Counter32,
              marsStatRxGrpLstReqMsgs     Counter32,
              marsStatRxJoinMsgs          Counter32,
              marsStatRxLeaveMsgs         Counter32,
              marsStatRxMservMsgs         Counter32,
              marsStatRxUnservMsgs        Counter32,
              marsStatRxBlkJoinMsgs       Counter32,
              marsStatRegMemGroups        Counter32,
              marsStatRegMcsGroups        Counter32
          }

      marsStatTxMultiMsgs OBJECT-TYPE
```

```
     SYNTAX   Counter32
     MAX-ACCESS read-only
     STATUS   current
     DESCRIPTION
         "Total number of MARS_MULTI transmitted by this MARS."
     ::= { marsStatEntry 1 }

 marsStatTxGrpLstRplyMsgs OBJECT-TYPE
     SYNTAX   Counter32
     MAX-ACCESS read-only
     STATUS   current
     DESCRIPTION
         "Total number of MARS_GROUPLIST_REPLY messages transmitted
          by this MARS."
     ::= { marsStatEntry 2 }

 marsStatTxRedirectMapMsgs OBJECT-TYPE
     SYNTAX   Counter32
     MAX-ACCESS read-only
     STATUS   current
     DESCRIPTION
         "Total number of MARS_REDIRECT_MAP messages transmitted by
          this MARS."
     ::= { marsStatEntry 3 }

 marsStatTxMigrateMsgs OBJECT-TYPE
     SYNTAX   Counter32
     MAX-ACCESS read-only
     STATUS   current
     DESCRIPTION
         "Total number of MARS_MIGRATE messages transmitted by
          this MARS."
     ::= { marsStatEntry 4 }

 marsStatTxNakMsgs OBJECT-TYPE
     SYNTAX   Counter32
     MAX-ACCESS read-only
     STATUS   current
     DESCRIPTION
         "Total number of MARS_NAK messages transmitted by this MARS."
     ::= { marsStatEntry 5 }

 marsStatTxJoinMsgs OBJECT-TYPE
     SYNTAX   Counter32
     MAX-ACCESS read-only
     STATUS   current
     DESCRIPTION
         "Total number of MARS_JOIN messages transmitted by this
```

```
             MARS."
         ::= { marsStatEntry 6 }

    marsStatTxLeaveMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_LEAVE messages transmitted by this
             MARS."
        ::= { marsStatEntry 7 }

    marsStatTxSjoinMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_SJOIN messages transmitted by this
             MARS."
        ::= { marsStatEntry 8 }

    marsStatTxSleaveMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_SLEAVE messages transmitted by this
             MARS."
        ::= { marsStatEntry 9 }

    marsStatTxMservMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_MSERV messages transmitted by this
             MARS."
        ::= { marsStatEntry 10 }

    marsStatTxUnservMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_UNSERV messages transmitted by this
             MARS."
        ::= { marsStatEntry 11 }
```

    marsStatRxReqMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_REQUEST messages received by this
             MARS."
        ::= { marsStatEntry 12 }

    marsStatRxGrpLstReqMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_GROUPLIST_REQUEST messages received
             by this MARS."
        ::= { marsStatEntry 13 }

    marsStatRxJoinMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_JOINS messages received by this MARS."
        ::= { marsStatEntry 14 }

    marsStatRxLeaveMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_LEAVES messages received by this MARS."
        ::= { marsStatEntry 15 }

    marsStatRxMservMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_MSERV messages received by this MARS."
        ::= { marsStatEntry 16 }

    marsStatRxUnservMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_UNSERV messages received by this MARS."

```
        ::= { marsStatEntry 17 }

    marsStatRxBlkJoinMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of block joins messages received by this MARS."
        ::= { marsStatEntry 18 }

    marsStatRegMemGroups OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of IP multicast groups with 1 or more joined
             cluster members."
        ::= { marsStatEntry 19 }

    marsStatRegMcsGroups OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of IP multicast groups with 1 or more joined
             MCSs."
        ::= { marsStatEntry 20 }

    --*************************************************************
    --   IP ATM MARS MCS Object Definitions
    --*************************************************************

    marsMcsObjects OBJECT IDENTIFIER ::= { marsMIB 3 }

    marsMcsTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF MarsMcsEntry
        MAX-ACCESS  not-accessible
        STATUS current
        DESCRIPTION
            "The objects defined in this table are used for
             the management of a multicast server (MCS)."
        ::= {   marsMcsObjects 1 }

    marsMcsEntry OBJECT-TYPE
        SYNTAX   MarsMcsEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
```

```
        "Each entry contains a MCS and its associated
         attributes."
    INDEX { marsMcsIndex, marsMcsIfIndex }
    ::= { marsMcsTable 1 }

MarsMcsEntry ::=
    SEQUENCE {
        marsMcsIndex                     Integer32,
        marsMcsIfIndex                   InterfaceIndex,
        marsMcsAddr                      AtmAddr,
        marsMcsDefaultMarsAddr           AtmAddr,
        marsMcsRegistration              INTEGER,
        marsMcsSsn                       Unsigned32,
        marsMcsDefaultMtu                INTEGER,
        marsMcsFailureTimer              INTEGER,
        marsMcsRetranDelayTimer          INTEGER,
        marsMcsRdmMulReqAddRetrTimer     INTEGER,
        marsMcsRdmVcRevalidateTimer      INTEGER,
        marsMcsRegisterRetrInterval      INTEGER,
        marsMcsRegisterRetrLimit         INTEGER,
        marsMcsRegWithMarsRdmTimer       INTEGER,
        marsMcsForceWaitTimer            INTEGER,
        marsMcsIdleTimer                 INTEGER,
        marsMcsLmtToMissRedirMapTimer    INTEGER,
        marsMcsRowStatus                 RowStatus
    }

marsMcsIndex OBJECT-TYPE
    SYNTAX  Integer32(1..65535)
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The auxiliary variable used to identify instances
         of the columnar objects in the MCS table."
    ::= { marsMcsEntry 1 }

marsMcsIfIndex OBJECT-TYPE
    SYNTAX  InterfaceIndex
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The ifIndex of the interface that the MCS is
         associated with."
    ::= { marsMcsEntry 2 }

marsMcsAddr OBJECT-TYPE
    SYNTAX  AtmAddr
    MAX-ACCESS read-create
```

```
        STATUS  current
        DESCRIPTION
            "The ATM address associated with the MCS."
        ::= { marsMcsEntry 3 }

    marsMcsDefaultMarsAddr OBJECT-TYPE
        SYNTAX  AtmAddr
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The default MARS ATM address which is needed to
             setup the initial signalling path between a MCS
             and its associated MARS."
        ::= { marsMcsEntry 4 }

    marsMcsRegistration OBJECT-TYPE
        SYNTAX  INTEGER {
            notRegistered (1),
            registering (2),
            registered (3),
            reRegisteringFault (4),
            reRegisteringRedirMap (5)
          }
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "An indication with regards to the registration
             STATUS of this MCS. The registration codes of
             'notRegistered (1)', 'registered (2)', and
             registered (3) are self-explanatory. The
             'reRegisteringFault (4)' indicates the MCS is
             in the process of re-registering with a MARS due
             to some fault conditions.  The 'reRegisteringRedMap
             (5)' status code shows that MCS is re-registering
             because it has received a MARS_REDIRECT_MAP message
             and was told to register with a shift MARS."
        ::= { marsMcsEntry 5 }

    marsMcsSsn OBJECT-TYPE
        SYNTAX  Unsigned32
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The MCS own 32 bit Server Sequence Number.  It
             is used to track the Mars sequence number."
        ::= { marsMcsEntry 6 }

    marsMcsDefaultMtu OBJECT-TYPE
```

```
        SYNTAX  INTEGER (1..65535)
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The default maximum transmission unit (MTU) used
             for this cluster.  Note that the actual size used
             for a VC between two members of the cluster may be
             negotiated during connection setup and may be
             different than this value.
             Default value = 9180 bytes."
        DEFVAL { 9180 }
        ::= { marsMcsEntry 7 }

    marsMcsFailureTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..2147483647)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "A timer used to flag the failure of last MARS_MULTI
             to arrive.  Default value = 10 seconds (recommended)."
        DEFVAL { 10 }
        ::= { marsMcsEntry 8 }

    marsMcsRetranDelayTimer OBJECT-TYPE
        SYNTAX  INTEGER (5..10)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The delay timer for sending out new MARS_REQUEST
             for the group after the MCS learned that there
             is no other group in the cluster.  The timer must
             be set between 5 and 10 seconds inclusive."
        ::= { marsMcsEntry 9 }

    marsMcsRdmMulReqAddRetrTimer OBJECT-TYPE
        SYNTAX  INTEGER (5..10)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The initial random L_MULTI_RQ/ADD retransmit timer
             which can be set between 5 and 10 seconds inclusive."
        ::= { marsMcsEntry 10 }

    marsMcsRdmVcRevalidateTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..10)
```

```
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The random time to set VC_revalidate flag.  The
             timer value ranges between 1 and 10 seconds
                 inclusive."
        ::= { marsMcsEntry 11 }

    marsMcsRegisterRetrInterval OBJECT-TYPE
        SYNTAX  INTEGER(5..2147483647)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "MARS_MSERV/UNSERV retransmit interval. The minimum
             and recommended values are 5 and 10 seconds,
             respectively."
        DEFVAL { 10 }
        ::= { marsMcsEntry 12 }

    marsMcsRegisterRetrLimit OBJECT-TYPE
        SYNTAX  INTEGER (0..5)
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "MARS_MSERV/UNSERV retransmit limit. The maximum value
             is 5."
        ::= { marsMcsEntry 13 }

    marsMcsRegWithMarsRdmTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..10)
        UNITS   "seconds"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Random time for a MCS to register with a MARS."
        ::= { marsMcsEntry 14 }

    marsMcsForceWaitTimer OBJECT-TYPE
        SYNTAX  INTEGER (1..2147483647)
        UNITS   "minutes"
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "Force wait if MARS re-registration is looping.
             The minimum value is 1 minute."
        ::= { marsMcsEntry 15 }
```

```
    marsMcsLmtToMissRedirMapTimer OBJECT-TYPE
        SYNTAX   INTEGER (1..4)
        UNITS    "seconds"
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "Timer limit for MCS to miss MARS_REDIRECT_MAPS."
        ::= { marsMcsEntry 16 }

    marsMcsIdleTimer OBJECT-TYPE
        SYNTAX   INTEGER (1..2147483647)
        UNITS    "minutes"
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "The configurable inactivity timer associated with a
             MCS. When a VC is created at this MCS, it gets
             the idle timer value from this configurable timer.
             The minimum suggested value is 1 minute and the
             recommended default value is 20 minutes."
        DEFVAL { 20 }
        ::= { marsMcsEntry 17 }

    marsMcsRowStatus OBJECT-TYPE
        SYNTAX   RowStatus
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
            "The object is used to create, delete or modify a
             row in this table.

             A row cannot be made 'active' until instances of
             all corresponding columns in the row of this table
             are appropriately configured and until the agent
             has also created a corresponding row in the
             marsMcsStatTable.

             When this object has a value of 'active', the
             following columnar objects can not be modified:

               marsMcsDefaultMarsAddr,
               marsMcsSsn,
               marsMcsRegstration,
               marsMcsDefaultMtu

             while other objects in this conceptual row can be
             modified irrespective of the value of this object.
```

            Deletion of this row is allowed regardless of
            whether or not a row in any associated tables
            (i.e., marsMcsVcTable) still exists or is in
            use. Once this row is deleted, it is recommended
            that the agent or the SNMP management station
            (if possible) through the set command deletes
            any stale rows that are associated with this
            row."
        ::= { marsMcsEntry 18 }

    --**
    -- IP ATM MARS MCS Multicast Group Address Object Definitions
    --**

    marsMcsMcGrpTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF MarsMcsMcGrpEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "This table contains a list of IP multicast group address
             blocks associated by a MARS MCS. The MCS uses the
             information contained in list to advertise its multicast
             group service to the MARS.
             Each row can be created or deleted via configuration."
        ::= { marsMcsObjects 2 }

    marsMcsMcGrpEntry OBJECT-TYPE
        SYNTAX   MarsMcsMcGrpEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "Each entry represents a consecutive block of multicast
             group addresses."
        INDEX { marsMcsIndex,
                marsMcsIfIndex,
                marsMcsMcMinGrpAddr,
                marsMcsMcMaxGrpAddr }
        ::= { marsMcsMcGrpTable 1 }

    MarsMcsMcGrpEntry ::=
        SEQUENCE {
            marsMcsMcMinGrpAddr   IpAddress,
            marsMcsMcMaxGrpAddr   IpAddress,
            marsMcsMcGrpRowStatus   RowStatus
        }

    marsMcsMcMinGrpAddr OBJECT-TYPE

```
    SYNTAX  IpAddress
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Minimum multicast group address - the min and max
         multicast forms multi-group block.  If the MinGrpAddr
         and MaxGrpAddr are the same, it indicates that this
         block contains a single group address.   Since the
         block joins are no allowed by a MCS as implied in
         the RFC2022, the MinGrpAddr and MaxGrpAddress should
         be set to the same value at this time when an entry
         row is created."
    ::= { marsMcsMcGrpEntry 1 }

marsMcsMcMaxGrpAddr OBJECT-TYPE
    SYNTAX  IpAddress
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Maximum multicast group address - the min and max
         multicast forms a multi-group block.  If the
         MinGrpAddr and MaxGrpAddr are the same, it indicates
         that this block contains a single group address.
         Since the block joins are no allowed by a MCS as
         implied in the RFC2022, the MinGrpAddr and
         MaxGrpAddress should be set to the same value at
         this time when an entry row is created."
    ::= { marsMcsMcGrpEntry 2 }

marsMcsMcGrpRowStatus OBJECT-TYPE
    SYNTAX  RowStatus
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "The object is used to create or delete a row in this
         table.

         Since other objects in this row are not-accessible
         'index-objects', the value of this object has no
         effect on whether those objects in this conceptual
         row can be modified."
    ::= { marsMcsMcGrpEntry 3 }

--*****************************************************************
-- IP ATM MARS MCS Backup MARS Object Definitions
--*****************************************************************

marsMcsBackupMarsTable OBJECT-TYPE
```

```
    SYNTAX   SEQUENCE OF MarsMcsBackupMarsEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table contains a list of backup MARS addresses that
         a MCS can make contact to in case of failure for
         connecting to the primary server. The list of addresses
         is in descending order of preference. It should be noted
         that the backup list provided by the MARS to the MCS
         via the MARS_REDIRECT_MAP message has a higher preference
         than addresses that are manually configured into the MCS.
         When such a list is received from the MARS, this information
         should be inserted at the top of the list.
         Each row can be created or deleted via configuration."
    ::= {  marsMcsObjects 3 }

marsMcsBackupMarsEntry OBJECT-TYPE
    SYNTAX  MarsMcsBackupMarsEntry
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Each entry represents an ATM address of a backup MARS."
    INDEX { marsMcsIndex,
            marsMcsIfIndex,
            marsMcsBackupMarsPriority,
            marsMcsBackupMarsAddr }
    ::= { marsMcsBackupMarsTable 1 }

MarsMcsBackupMarsEntry ::=
    SEQUENCE {
        marsMcsBackupMarsPriority      Unsigned32,
        marsMcsBackupMarsAddr          AtmAddr,
        marsMcsBackupMarsRowStatus     RowStatus
    }

marsMcsBackupMarsPriority OBJECT-TYPE
    SYNTAX  Unsigned32(0..65535)
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The priority associated with a backup MARS. A lower
         priority value inidcates a higher preference."
    ::= { marsMcsBackupMarsEntry 1 }

marsMcsBackupMarsAddr OBJECT-TYPE
    SYNTAX  AtmAddr
    MAX-ACCESS not-accessible
    STATUS  current
```

```
     DESCRIPTION
         "The ATM address associated with a backup MARS."
     ::= { marsMcsBackupMarsEntry 2 }

  marsMcsBackupMarsRowStatus OBJECT-TYPE
     SYNTAX   RowStatus
     MAX-ACCESS read-create
     STATUS   current
     DESCRIPTION
         "The object is used to create or delete a row in this
          table.

          Since other objects in this row are not-accessible
          'index-objects', the value of this object has no
          effect on whether those objects in this conceptual
          row can be modified."
     ::= { marsMcsBackupMarsEntry 3 }

  --*************************************************************
  --   IP ATM MARS MCS VC Object Definition Table
  --*************************************************************

  marsMcsVcTable OBJECT-TYPE
     SYNTAX   SEQUENCE OF MarsMcsVcEntry
     MAX-ACCESS  not-accessible
     STATUS current
     DESCRIPTION
         "This table contains information about open virtual
          circuits (VCs) that a MCS has.  For point to
          point circuit, each entry represents a single VC
          connection between this MCS ATM address to another
          party ATM address.  In the case of point to
          multipoint connection where a single source address
          is associated with multiple destinations, several
          entries are used to represent the relationship.  An
          example of point to multi-point VC represented in a
          table is shown below.

             MCS       VPI/VCI    Grp Addr1/Addr2    Part Addr
              1          0,1          g1,g2            p1
              1          0,1          g1,g2            p2
              1          0,1          g1,g2            p3"
     ::= {  marsMcsObjects 4 }

  marsMcsVcEntry OBJECT-TYPE
     SYNTAX   MarsMcsVcEntry
     MAX-ACCESS not-accessible
     STATUS   current
```

```
        DESCRIPTION
            "The objects contained in the entry are VC related
             attributes such as VC signalling type, control VC
             type, idle timer, negotiated MTU size, etc."
        INDEX { marsMcsIndex,
                marsMcsIfIndex,
                marsMcsVcVpi,
                marsMcsVcVci,
                marsMcsVcMinGrpAddr,
                marsMcsVcMaxGrpAddr,
                marsMcsVcPartyAddr }
        ::= { marsMcsVcTable 1 }

    MarsMcsVcEntry ::=
        SEQUENCE {
            marsMcsVcVpi            INTEGER,
            marsMcsVcVci            INTEGER,
            marsMcsVcMinGrpAddr     IpAddress,
            marsMcsVcMaxGrpAddr     IpAddress,
            marsMcsVcPartyAddr      AtmAddr,
            marsMcsVcPartyAddrType  INTEGER,
            marsMcsVcType           INTEGER,
            marsMcsVcCtrlType       INTEGER,
            marsMcsVcIdleTimer      INTEGER,
            marsMcsVcRevalidate     TruthValue,
            marsMcsVcEncapsType     INTEGER,
            marsMcsVcNegotiatedMtu  INTEGER,
            marsMcsVcRowStatus      RowStatus
        }

    marsMcsVcVpi OBJECT-TYPE
        SYNTAX  INTEGER (0..4095)
        MAX-ACCESS not-accessible
        STATUS  current
        DESCRIPTION
            "The value of virtual path identifier (VPI). Since
             a VPI can be numbered 0, this sub-index can take
             a value of 0."
        ::= { marsMcsVcEntry 1 }

    marsMcsVcVci OBJECT-TYPE
        SYNTAX  INTEGER (0..65535)
        MAX-ACCESS not-accessible
        STATUS  current
        DESCRIPTION
            "The value of virtual circuit identifier (VCI). Since
             a VCI can be numbered 0, this sub-index can take
             a value of 0."
```

```
     ::= { marsMcsVcEntry 2 }

marsMcsVcMinGrpAddr OBJECT-TYPE
    SYNTAX  IpAddress
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Minimum IP multicast group address - the min and
         max multicast forms a multi-group block which is
         associated with a VC.  If the MinGrpAddr and
         MaxGrpAddr are the same, it indicates that the
         size of multi-group block is 1, a single IP group."
    ::= { marsMcsVcEntry 3 }

marsMcsVcMaxGrpAddr OBJECT-TYPE


    SYNTAX  IpAddress
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "Maximum IP multicast group address - the min
         and max multicast forms a multi-group block
         which is associated with a VC. If the MinGrpAddr
         and MaxGrpAddr are the same, it indicates that the
         size of multi-group block is 1, a single IP group."
    ::= { marsMcsVcEntry 4 }

marsMcsVcPartyAddr OBJECT-TYPE
    SYNTAX  AtmAddr
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "An ATM party address in which this VC is linked.
         The party type is identified by the
         marsMcsVcPartyAddrType."
    ::= { marsMcsVcEntry 5 }

marsMcsVcPartyAddrType OBJECT-TYPE
    SYNTAX  INTEGER {
          called (1),
          calling (2)
        }
    MAX-ACCESS read-create
    STATUS  current
    DESCRIPTION
        "The party type is associated with the party address.
         The called (1) indicates that the party address is
```

```
        a destination address which implies that VC is
        originated from this MCS.  The calling (2) indicates
        the VC was initiated externally to this MCS.  In this
        case, the party address is the source address."
    ::= { marsMcsVcEntry 6 }

marsMcsVcType OBJECT-TYPE
    SYNTAX   INTEGER {
         pvc (1),
         svc (2)
       }
    MAX-ACCESS read-create
    STATUS   current
    DESCRIPTION
        "Circuit Connection type: permanent virtual circuit or
         switched virtual circuit."
    ::= { marsMcsVcEntry 7 }


marsMcsVcCtrlType OBJECT-TYPE
    SYNTAX   INTEGER {
          pointToPointVC (1),
          serverControlVC (2),
          pointToMultiPointVC (3)
        }
    MAX-ACCESS read-create
    STATUS   current
    DESCRIPTION
        "Control VC type used to specify a particular connection.
           pointToPointVC (1):
             used by the ATM Clients for the registration and
             queries.  This VC or the initial signalling path is
             set up from the source MCS to a MARS. It is
             bi-directional.
           serverControlVC (2):
             used by a MARS to issue asynchronous updates to an
             ATM Client.  This VC is established from the MARS
             to the MCS.
           pointToMultiPointVC (3):
             used by the client to transfer multicast data
             packets from layer 3.  This VC is established from
             this VC to a cluster member."
    ::= { marsMcsVcEntry 8 }

marsMcsVcIdleTimer OBJECT-TYPE
    SYNTAX   INTEGER (1..2147483647)
    UNITS    "minutes"
    MAX-ACCESS read-create
```

```
        STATUS  current
        DESCRIPTION
            "The idle timer associated with this VC. The minimum
             suggested value is 1 minute and the recommended
             default value is 20 minutes."
        DEFVAL { 20 }
        ::= { marsMcsVcEntry 9 }

    marsMcsVcRevalidate OBJECT-TYPE
        SYNTAX  TruthValue
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "A flag associated with an open and active multipoint
             VC. It is checked every time a packet is queued for
             transmission on that VC. The object has the value of
             true (1) if revalidate is required and the value
             false (2) otherwise."
        ::= { marsMcsVcEntry 10 }

    marsMcsVcEncapsType OBJECT-TYPE
        SYNTAX  INTEGER {
              other (1),
              llcSnap (2)
            }
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The encapsulation type used when communicating over
             this VC."
        ::= { marsMcsVcEntry 11 }

    marsMcsVcNegotiatedMtu OBJECT-TYPE
        SYNTAX  INTEGER (1..65535)
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The negotiated MTU when communicating over this VC."
        ::= { marsMcsVcEntry 12 }

    marsMcsVcRowStatus OBJECT-TYPE
        SYNTAX  RowStatus
        MAX-ACCESS read-create
        STATUS  current
        DESCRIPTION
            "The object is used to create, delete or modify a
             row in this table.
```

             A row cannot be made 'active' until instances of
             all corresponding columns in the row of this table
             are appropriately configured.

             While objects: marsMcsVcIdleTimer and
             marsMcsVcRevalidate in this conceptual row can
             be modified irrespective of the value of this
             object, all other objects in the row can not be
             modified when this object has a value of 'active'.

             It is possible for an SNMP management station
             to set the row to 'notInService' and modify
             the entry and then set it back to 'active'
             with the following exception. That is, rows
             for which the corresponding instance of
             marsMcsVcType has a value of 'svc' can not
             be modified or deleted."
        ::= { marsMcsVcEntry 13 }

    --***
    -- IP ATM MARS MCS Statistics Definition Table
    --***

    marsMcsStatTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF MarsMcsStatEntry
        MAX-ACCESS   not-accessible
        STATUS current
        DESCRIPTION
            "The table contains statistics collected at MARS MCSs."
        ::= {   marsMcsObjects 5 }

    marsMcsStatEntry OBJECT-TYPE
        SYNTAX   MarsMcsStatEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "Each entry contains statistics collected at one
             MARS MCS."
        INDEX { marsMcsIndex, marsMcsIfIndex }
        ::= { marsMcsStatTable 1 }

    MarsMcsStatEntry ::=
        SEQUENCE {
            marsMcsStatTxReqMsgs   Counter32,
            marsMcsStatTxMservMsgs   Counter32,
            marsMcsStatTxUnservMsgs   Counter32,
            marsMcsStatRxMultiMsgs   Counter32,
            marsMcsStatRxSjoinMsgs   Counter32,

```
        marsMcsStatRxSleaveMsgs     Counter32,
        marsMcsStatRxNakMsgs        Counter32,
        marsMcsStatRxMigrateMsgs    Counter32,
        marsMcsStatFailMultiMsgs    Counter32
    }

marsMcsStatTxReqMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_REQUEST messages transmitted
         from this MCS."
    ::= { marsMcsStatEntry 1 }

marsMcsStatTxMservMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_MSERV messages transmitted from
         this MCS."
    ::= { marsMcsStatEntry 2 }

marsMcsStatTxUnservMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_UNSERV messages transmitted from
         this MCS."
    ::= { marsMcsStatEntry 3 }

marsMcsStatRxMultiMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_MULTI messages received by
         this MCS."
    ::= { marsMcsStatEntry 4 }

marsMcsStatRxSjoinMsgs OBJECT-TYPE
    SYNTAX   Counter32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "Total number of MARS_SJOIN messages received by
```

```
             this MCS."
        ::= { marsMcsStatEntry 5 }

    marsMcsStatRxSleaveMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_SLEAVE messages received
             by this MCS."
        ::= { marsMcsStatEntry 6 }

    marsMcsStatRxNakMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_NAK messages received
             by this MCS."
        ::= { marsMcsStatEntry 7 }

    marsMcsStatRxMigrateMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of MARS_MIGRATE messages received
             by this MCS."
        ::= { marsMcsStatEntry 8 }

    marsMcsStatFailMultiMsgs OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
            "Total number of timeouts occurred indicating
             failure of the last MARS_MULTI to arrive."
        ::= { marsMcsStatEntry 9 }

    --*************************************************************
    --   IP ATM MARS Notification Definitions
    --*************************************************************

    marsTrapInfo OBJECT IDENTIFIER ::= { marsMIB 0 }

    marsFaultTrap NOTIFICATION-TYPE
        OBJECTS {
            marsAddr,
```

```
         marsServStatus
            }
      STATUS  current
      DESCRIPTION
          "This trap/inform is sent to the manager whenever
           there is a fault condition occurred on a MARS."
      ::= { marsTrapInfo 1 }


   --*************************************************************
   --  IP ATM MARS Conformance Definitions
   --*************************************************************

   marsConformance       OBJECT IDENTIFIER ::= { marsMIB 4 }
   marsClientConformance OBJECT IDENTIFIER ::= { marsConformance 1 }
   marsServerConformance OBJECT IDENTIFIER ::= { marsConformance 2 }
   marsMcsConformance    OBJECT IDENTIFIER ::= { marsConformance 3 }

   marsClientCompliances OBJECT IDENTIFIER ::= { marsClientConformance 1 }
   marsClientGroups      OBJECT IDENTIFIER ::= { marsClientConformance 2 }

   marsServerCompliances OBJECT IDENTIFIER ::= { marsServerConformance 1 }


   marsServerGroups      OBJECT IDENTIFIER ::= { marsServerConformance 2 }

   marsMcsCompliances    OBJECT IDENTIFIER ::= { marsMcsConformance 1 }
   marsMcsGroups         OBJECT IDENTIFIER ::= { marsMcsConformance 2 }

   --*************************************************************
   -- MARS Client Compliance Statements
   --*************************************************************

   marsClientCompliance MODULE-COMPLIANCE
      STATUS  current
      DESCRIPTION
          "The compliance statement for entities that are required
           for the management of MARS clients."
      MODULE
          MANDATORY-GROUPS {
           marsClientGroup
           }

      OBJECT marsClientAddr
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsClientDefaultMarsAddr
```

```
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientHsn
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientRegistration
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientCmi
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientDefaultMtu
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."


        OBJECT marsClientFailureTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientRetranDelayTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientRdmMulReqAddRetrTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientRdmVcRevalidateTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsClientJoinLeaveRetrInterval
        MIN-ACCESS read-only
        DESCRIPTION
```

```
          "Write access is not required."


     OBJECT marsClientJoinLeaveRetrLimit
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientRegWithMarsRdmTimer
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientForceWaitTimer
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientLmtToMissRedirMapTimer
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientIdleTimer
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientRowStatus
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientMcGrpRowStatus
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientBackupMarsRowStatus
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientVcType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."


     OBJECT marsClientVcCtrlType
```

```
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsClientVcIdleTimer
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsClientVcRevalidate
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsClientVcEncapsType
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsClientVcNegotiatedMtu
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsClientVcRowStatus
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         ::= { marsClientCompliances 1 }

   marsClientGroup OBJECT-GROUP
         OBJECTS {
             marsClientAddr,
             marsClientDefaultMarsAddr,
             marsClientHsn,
             marsClientRegistration,
             marsClientCmi,
             marsClientDefaultMtu,
             marsClientFailureTimer,
             marsClientRetranDelayTimer,
             marsClientRdmMulReqAddRetrTimer,
             marsClientRdmVcRevalidateTimer,
             marsClientJoinLeaveRetrInterval,
             marsClientJoinLeaveRetrLimit,
             marsClientRegWithMarsRdmTimer,
             marsClientForceWaitTimer,
             marsClientIdleTimer,
```

```
        marsClientLmtToMissRedirMapTimer,
        marsClientRowStatus,
        marsClientMcGrpRowStatus,
        marsClientBackupMarsRowStatus,
        marsClientVcPartyAddrType,
        marsClientVcType,
        marsClientVcCtrlType,
        marsClientVcIdleTimer,
        marsClientVcRevalidate,
        marsClientVcEncapsType,
        marsClientVcNegotiatedMtu,
        marsClientVcRowStatus,
        marsClientStatTxReqMsgs,
        marsClientStatTxJoinMsgs,
        marsClientStatTxLeaveMsgs,
        marsClientStatTxGrpLstReqMsgs,
        marsClientStatRxJoinMsgs,
        marsClientStatRxLeaveMsgs,
        marsClientStatRxMultiMsgs,
        marsClientStatRxNakMsgs,
        marsClientStatRxGrpLstRplyMsgs,
        marsClientStatRxMigrateMsgs,
        marsClientStatFailMultiMsgs
        }
    STATUS  current
    DESCRIPTION
        "A collection of objects to be implemented in a MIB
         for the management of MARS clients."
    ::= { marsClientGroups 1 }


--***************************************************************
-- MARS Server Compliance Statements
--***************************************************************

marsServerCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
        "The compliance statement for entities that are required
         for the management of MARS servers."
    MODULE -- this module
        MANDATORY-GROUPS {
         marsServerGroup,
         marsServerEventGroup
         }

    OBJECT marsAddr
    MIN-ACCESS read-only
    DESCRIPTION
```

          "Write access is not required."

      OBJECT marsLocal
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsServStatus
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsServType
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsServPriority
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsRedirMapMsgTimer
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsCsn
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsSsn
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsRowStatus
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsMcGrpAddrUsage
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsMcGrpRowStatus

```
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsHostMapRowType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsHostMapRowStatus
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsServerMapRowType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsServerMapRowStatus
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsVcPartyAddrType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsVcType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsVcCtrlType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsVcIdleTimer
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsVcCmi
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."
```

```
      OBJECT marsVcEncapsType
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsVcNegotiatedMtu
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      OBJECT marsVcRowStatus
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

      ::= { marsServerCompliances 1 }

   marsServerGroup OBJECT-GROUP
        OBJECTS {
          marsAddr,
          marsLocal,
          marsServStatus,
          marsServType,
          marsServPriority,
          marsRedirMapMsgTimer,
          marsCsn,
          marsSsn,
          marsRowStatus,
          marsMcGrpAddrUsage,
          marsMcGrpRxLayer3GrpSets,
          marsMcGrpRxLayer3GrpResets,
          marsMcGrpRowStatus,
          marsHostMapRowType,
          marsHostMapRowStatus,
          marsServerMapRowType,
          marsServerMapRowStatus,
          marsVcPartyAddrType,
          marsVcType,
          marsVcCtrlType,
          marsVcIdleTimer,
          marsVcCmi,
          marsVcEncapsType,
          marsVcNegotiatedMtu,
          marsVcRowStatus,
          marsRegClientAtmAddr,
          marsRegMcsAtmAddr,
          marsStatTxMultiMsgs,
          marsStatTxGrpLstRplyMsgs,
```

```
        marsStatTxRedirectMapMsgs,
        marsStatTxMigrateMsgs,
        marsStatTxNakMsgs,
        marsStatTxJoinMsgs,
        marsStatTxLeaveMsgs,
        marsStatTxSjoinMsgs,
        marsStatTxSleaveMsgs,
        marsStatTxMservMsgs,
        marsStatTxUnservMsgs,
        marsStatRxReqMsgs,
        marsStatRxGrpLstReqMsgs,
        marsStatRxJoinMsgs,
        marsStatRxLeaveMsgs,
        marsStatRxMservMsgs,
        marsStatRxUnservMsgs,
        marsStatRxBlkJoinMsgs,
        marsStatRegMemGroups,
        marsStatRegMcsGroups
        }
    STATUS  current
    DESCRIPTION
        "A collection of objects to be implemented in a MIB
         for the management of MARS servers."
    ::= { marsServerGroups 1 }

marsServerEventGroup NOTIFICATION-GROUP
    NOTIFICATIONS { marsFaultTrap }
    STATUS  current
    DESCRIPTION
        "A collection of events that can be generated from
         a MARS server."
    ::= { marsServerGroups 2 }

--***************************************************************
-- MARS Multicast Server (MCS) Compliance Statements
--***************************************************************

marsMcsCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
        "The compliance statement for entities that are required
         for the management of MARS multicast servers (MCS)."
    MODULE
        MANDATORY-GROUPS {
         marsMcsGroup
         }

    OBJECT marsMcsAddr
```

```
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsDefaultMarsAddr
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsRegistration
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsSsn
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsDefaultMtu
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsFailureTimer
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsRetranDelayTimer
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsRdmMulReqAddRetrTimer
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsRdmVcRevalidateTimer
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."

         OBJECT marsMcsRegisterRetrInterval
         MIN-ACCESS read-only
         DESCRIPTION
           "Write access is not required."
```

```
        OBJECT marsMcsRegisterRetrLimit
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsForceWaitTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsLmtToMissRedirMapTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsIdleTimer
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsRowStatus
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsMcGrpRowStatus
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsBackupMarsRowStatus
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsVcPartyAddrType
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsVcType
        MIN-ACCESS read-only
        DESCRIPTION
          "Write access is not required."

        OBJECT marsMcsVcCtrlType
        MIN-ACCESS read-only
        DESCRIPTION
```

```
         "Write access is not required."

     OBJECT marsMcsVcIdleTimer
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsMcsVcRevalidate
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsMcsVcEncapsType
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsMcsVcNegotiatedMtu
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     OBJECT marsMcsVcRowStatus
     MIN-ACCESS read-only
     DESCRIPTION
       "Write access is not required."

     ::= { marsMcsCompliances 1 }

   marsMcsGroup OBJECT-GROUP
       OBJECTS {
           marsMcsAddr,
           marsMcsDefaultMarsAddr,
           marsMcsRegistration,
           marsMcsSsn ,
           marsMcsDefaultMtu,
           marsMcsFailureTimer,
           marsMcsRetranDelayTimer,
           marsMcsRdmMulReqAddRetrTimer,
           marsMcsRdmVcRevalidateTimer,
           marsMcsRegisterRetrInterval,
           marsMcsRegisterRetrLimit,
           marsMcsRegWithMarsRdmTimer,
           marsMcsForceWaitTimer,
           marsMcsIdleTimer,
           marsMcsLmtToMissRedirMapTimer,
           marsMcsRowStatus,
           marsMcsMcGrpRowStatus,
```

```
            marsMcsVcPartyAddrType,
            marsMcsBackupMarsRowStatus,
            marsMcsVcType,
            marsMcsVcCtrlType,
            marsMcsVcIdleTimer,
            marsMcsVcRevalidate,
            marsMcsVcEncapsType,
            marsMcsVcNegotiatedMtu,
            marsMcsVcRowStatus,
            marsMcsStatTxReqMsgs,
            marsMcsStatTxMservMsgs,
            marsMcsStatTxUnservMsgs,
            marsMcsStatRxMultiMsgs,
            marsMcsStatRxSjoinMsgs,
            marsMcsStatRxSleaveMsgs,
            marsMcsStatRxNakMsgs,
            marsMcsStatRxMigrateMsgs,
            marsMcsStatFailMultiMsgs
          }
      STATUS  current
      DESCRIPTION
          "A collection of objects to be implemented in a MIB
           for the management of MARS multicast servers (MCS)."
      ::= { marsMcsGroups 1 }

        END
```

4. Acknowledgments

    This document is a product of the IETF's Internetworking Over NBMA
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    for his thorough review of the MARS MIB.

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6. Security Considerations

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

   SNMPv1 by itself is such an insecure environment. Even if the network
   itself is secure (for example by using IPSec), even then, there is no
   control as to who on the secure network is allowed to access and SET
   (change/create/delete) the objects in this MIB.

   It is recommended that the implementers consider the security
   features as provided by the SNMPv3 framework. Specifically, the use
   of the User-based Security Model RFC 2274 [8] and the View-based
   Access Control Model RFC 2275 [9] is recommended.

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

Note: read-access in fact may also need access-control.

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