                     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 represents 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

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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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