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

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


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


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:

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

- MARS Client Multicast Group Table
  A list of IP multicast address blocks associated with a MARS client.

- MARS Client Backup MARS Group Table
  A list of backup MARS’s associated with a MARS client.

- MARS Client VC Table
  Information about VCs opened by a client.

- 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:

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

- MARS Multicast Group Table
  A list of IP multicast address blocks associated with a MARS.

- MARS VC Table
  Information about VCs opened by a MARS.

- MARS Registered Client Table
A list of clients registered with a MARS.

- MARS Registered Multicast Server Table

A list of MCSs registered with a MARS.

- MARS Statistics Table
  Statistics collected by a MARS.

- MARS Host Map Table
  Mappings between multicast groups and clients maintained by a MARS.

- 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:

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

- MARS MCS Multicast Group Table
  A list of IP multicast address blocks associated with a MARS MCS.

- MARS MCS Backup Mars Group Table
  A list of backup MARS’s associated with a MARS MCS.

- MARS Multicast Server VC Table
  Information about VCs opened by a MCS.

- 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"
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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
--*************************************************************

Chung & Greene              Standards Track                     [Page 6]
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,
- marsClientRegistration,
- 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 indicates 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.

<table>
<thead>
<tr>
<th>Client</th>
<th>VPI/VCI</th>
<th>Grp Addr1/Addr2</th>
<th>Part Addr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0,1</td>
<td>g1,g2</td>
<td>p1</td>
</tr>
<tr>
<td>1</td>
<td>0,1</td>
<td>g1,g2</td>
<td>p2</td>
</tr>
<tr>
<td>1</td>
<td>0,1</td>
<td>g1,g2</td>
<td>p3</td>
</tr>
</tbody>
</table>

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
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
RFC 2366  Multicast MIB  July 1998

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 }
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
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 and 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.

<table>
<thead>
<tr>
<th>MARS</th>
<th>VPI/VCI</th>
<th>MARS Addr</th>
<th>Party Addr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0,1</td>
<td>m1</td>
<td>p1</td>
</tr>
<tr>
<td>1</td>
<td>0,1</td>
<td>m1</td>
<td>p2</td>
</tr>
<tr>
<td>1</td>
<td>0,1</td>
<td>m1</td>
<td>p3</td>
</tr>
</tbody>
</table>

::= { 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)
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 }

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,
marsStatRxGrpLstRqMsgs     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
::= { 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 ‘reRegisteringRedirMap
(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,
marsMcsRegistration,
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
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.
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.

<table>
<thead>
<tr>
<th>MCS</th>
<th>VPI/VCI</th>
<th>Grp Addr1/Addr2</th>
<th>Part Addr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0,1</td>
<td>g1,g2</td>
<td>p1</td>
</tr>
<tr>
<td>1</td>
<td>0,1</td>
<td>g1,g2</td>
<td>p2</td>
</tr>
<tr>
<td>1</td>
<td>0,1</td>
<td>g1,g2</td>
<td>p3</td>
</tr>
</tbody>
</table>

::= { 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.

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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 }
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 marsVcCtrlrType
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 OCTET-STRING
OBJECT-IDENTITY
OBJECTS {
  marsAddr,
  marsLocal,
  marsServStatus,
  marsServType,
  marsServPriority,
  marsRedirMapMsgTimer,
  marsCsn,
  marsSsn,
  marsRowStatus,
  marsMcGrpAddrUsage,
  marsMcGrpRxLayer3GrpSets,
  marsMcGrpRxLayer3GrpResets,
  marsMcGrpRowStatus,
  marsHostMapRowType,
  marsHostMapRowStatus,
  marsServerMapRowType,
  marsServerMapRowStatus,
  marsVcPartyAddrType,
  marsVcType,
  marsVcCtrl1Type,
  marsVcIdleTimer,
  marsVcCmi,
  marsVcEncapsType,
  marsVcNegotiatedMtu,
  marsVcRowStatus,
  marsRegClientAtmAddr,
  marsRegMcsAtmAddr,
  marsStatTxMultiMsgs,
  marsStatTxGrpLstRplyMsgs,
marsStatTxRedirectMapMsgs,
marsStatTxMigrateMsgs,
marsStatTxNakMsgs,
marsStatTxJoinMsgs,
marsStatTxLeaveMsgs,
marsStatTxSjoinMsgs,
marsStatTxSleaveMsgs,
marsStatTxMservMsgs,
marsStatTxUnservMsgs,
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,
marsMcsVcCtrlrType,
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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5. References

Networks.", RFC 2022, November 1996.

Waldbusser, "Structure of Management Information for Version 2 of the
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.

7. Authors’ Addresses

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