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C. Chung
SAIC
M. Greene
Independent Contractor
(Editor)
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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
              1710 Goodridge Drive
              Mail Stop 1-4-7
              McLean, VA 22102
      Tel:      +1 703 448 6485
      Fax:      +1 703 356 2160
      E-mail:   cchung@tieo.saic.com

      Editor:  Maria Greene
      Postal:  Independent Contractor
      E-mail:  maria@xedia.com
    "
```

```
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,
    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.

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,
            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

```

```

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 indicates 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.

7. Authors' Addresses

Chris Chung
Science Applications International Corp. (SAIC)
1710 Goodridge Drive
Mail Stop 1-4-7
McLean, VA 22102
Phone: (703) 448-6485
EMail: cchung@tieo.saic.com

Maria Greene (editor)
Independent Contractor
E-mail: maria@xedia.com

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