

Network Working Group
Request for Comments: 2417
Obsoletes: 2366
Category: Standards Track

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September 1998

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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IANA Note

Due to a clerical error in the assignment of the snmpModules in this memo, this RFC provides the corrected number assignment for this protocol. This memo obsoletes RFC 2366.

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.

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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 STD 15, 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 "9809010000Z" -- 01 September 1998
    ORGANIZATION "Internetworking Over NBMA (ion) Working Group"
    CONTACT-INFO
        "          Chris Chung (chihschung@aol.com)
          Independent Consultant
```

```
    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).
    "
```

```
REVISION      "9809010000Z" -- 01 September 1998
```

```
DESCRIPTION   "Published as RFC 2417. Changes/fixes:
    - reroot this MIB from snmpModules to mib-2
      to be consistent with location of other MIBs.
    - obsoletes RFC2366."
```

```
REVISION      "9804150145Z" -- 15 April 1998
```

```
DESCRIPTION   "Initial version, published as RFC 2366"
::= { mib-2 57 }
```

```
--*****
```

```

-- 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_MULTII 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 MarshHostMapEntry
    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 MarshHostMapEntry
    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 }

```

```
MarshHostMapEntry ::=
    SEQUENCE {
        marshHostMapAtmAddr      AtmAddr,
        marshHostMapRowType      INTEGER,
        marshHostMapRowStatus    RowStatus
    }

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

marshHostMapRowType 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."
    ::= { marshHostMapEntry 2 }

marshHostMapRowStatus 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
        marshHostMapRowType 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 }

marsVcEncapType 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_MULTII 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,
    marsMcsVcVcType        INTEGER,
    marsMcsVcCtrlType      INTEGER,
    marsMcsVcIdleTimer     INTEGER,
    marsMcsVcRevalidate    TruthValue,
    marsMcsVcEncapstType   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 }

marsMcsVcEncapType 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_MULTII messages received by
         this MCS."
    ::= { marsMcsStatEntry 4 }

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

```

        this MCS."
 ::= { marsMcsStatEntry 5 }

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

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

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

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

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

marsTrapInfo OBJECT IDENTIFIER ::= { marsMIB 0 }

marsFaultTrap NOTIFICATION-TYPE
    OBJECTS {
        marsAddr,

```

```

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

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

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

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

marsServerCompliances    OBJECT IDENTIFIER ::= { marsServerConformance 1 }

marsServerGroups         OBJECT IDENTIFIER ::= { marsServerConformance 2 }

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

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

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

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

    OBJECT marsClientDefaultMarsAddr

```

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

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

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

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

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

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

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

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

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

OBJECT marsClientJoinLeaveRetrInterval
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientJoinLeaveRetrLimit
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientRegWithMarsRdmTimer
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientForceWaitTimer
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientLmtToMissRedirMapTimer
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientIdleTimer
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientRowStatus
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientMcGrpRowStatus
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientBackupMarsRowStatus
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientVcType
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsClientVcCtrlType

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

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

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

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

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

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

::= { marsClientCompliances 1 }

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


```

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

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

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

OBJECT marsAddr
MIN-ACCESS read-only
DESCRIPTION

```

"Write access is not required."

OBJECT marsLocal

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsServStatus

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsServType

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsServPriority

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsRedirMapMsgTimer

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsCsn

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsSsn

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsRowStatus

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsMcGrpAddrUsage

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsMcGrpRowStatus

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

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

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

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

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

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

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

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

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

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

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

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

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

::= { marsServerCompliances 1 }

marsServerGroup OBJECT-GROUP

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

```

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

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

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

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

OBJECT marsMcsAddr

```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

OBJECT marsMcsVcCtrlType
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

OBJECT marsMcsVcIdleTimer

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsMcsVcRevalidate

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsMcsVcEncapsType

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsMcsVcNegotiatedMtu

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT marsMcsVcRowStatus

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

::= { marsMcsCompliances 1 }

marsMcsGroup OBJECT-GROUP

OBJECTS {

 marsMcsAddr,
 marsMcsDefaultMarsAddr,
 marsMcsRegistration,
 marsMcsSsn ,
 marsMcsDefaultMtu,
 marsMcsFailureTimer,
 marsMcsRetranDelayTimer,
 marsMcsRdmMulReqAddRetrTimer,
 marsMcsRdmVcRevalidateTimer,
 marsMcsRegisterRetrInterval,
 marsMcsRegisterRetrLimit,
 marsMcsRegWithMarsRdmTimer,
 marsMcsForceWaitTimer,
 marsMcsIdleTimer,
 marsMcsLmtToMissRedirMapTimer,
 marsMcsRowStatus,
 marsMcsMcGrpRowStatus,


```

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

```
 ::= { marsMcsGroups 1 }
```

END

4. Acknowledgments

This document is a product of the IETF's Internetworking Over NBMA Networks (ion) Working Group. The original work of the MARS MIB developement was sponsored by Science Applications International Corporation (SAIC).

The author would like to recognize Grenville Armitage (Bellcore), Ken Carlberg (SAIC), Ramesh Uppuluri (Fore Systems), and Radha Gowda SYNNET), and Bill Willcox (Fujitsu Nexion) for their support and comments in completing the MARS MIB. Also thanks to Bert Wijnen (IBM) for his thorough review of the MARS MIB.

5. References

- [1] Armitage, G., "Support for Multicast over UNI 3.0/3.1 based ATM Networks", RFC 2022, November 1996.

- [2] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Structure of Management Information for Version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1902, January 1996.
- [3] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Textual Conventions for Version 2 of the of the Simple Network Management Protocol (SNMPv2)", RFC 1903, January 1996.
- [4] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Conformance Statements for Version 2 of the of the Simple Network Management Protocol (SNMPv2)", RFC 1904, January 1996.
- [5] Case, J., Fedor, M., Schoffstall, M., and J. Davin, "Simple Network Management Protocol", STD 15, RFC 1157, May 1990.
- [6] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1905, January 1996.
- [7] McCloghrie, K., and M. Rose, Editors, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, RFC 1213, March 1991.
- [8] SNMPv3 Working Group, Blumenthal, U., and B. Wijnen, "User-based Security Model (USM) for version 3 of Simple Network Management Protocol (SNMPv3)", RFC 2274, January 1998.
- [9] SNMPv3 Working Group, Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", RFC 2275, January 1998.

6. Security Considerations

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

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

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

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

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

7. Authors' Addresses

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