Multicast Address Allocation MIB

Status of this Memo

   This document specifies an Internet standards track protocol for the
   Internet community, and requests discussion and suggestions for
   improvements. Please refer to the current edition of the "Internet
   Official Protocol Standards" (STD 1) for the standardization state
   and status of this protocol. Distribution of this memo is unlimited.

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Abstract

   This memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it describes managed objects used for managing
   multicast address allocation.

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1. Introduction

   This document defines a Management Information Base (MIB) module for
   managing multicast address allocation in a protocol-independent
   manner, as well as for managing specific protocols used in allocating
   multicast addresses. The protocol-independent objects in this MIB
   apply to all multicast address allocation servers (MAASs) and
   clients, as described in [ARCH], including those that allocate
   source-specific multicast addresses for the local machine.

   The protocol-specific objects in this MIB include objects related to
   the Multicast Address Dynamic Client Allocation Protocol (MADCAP)
   [MADCAP]. Interactions with the Multicast-scope Zone Announcement
   Protocol (MZAP) [MZAP] are also noted where appropriate.

2. The Internet-Standard Management Framework

   For a detailed overview of the documents that describe the current
   Internet-Standard Management Framework, please refer to section 7 of
   RFC 3410 [RFC3410].

   Managed objects are accessed via a virtual information store, termed
   the Management Information Base or MIB. MIB objects are generally
   accessed through the Simple Network Management Protocol (SNMP).

   Objects in the MIB are defined using the mechanisms defined in the
   Structure of Management Information (SMI). This memo specifies a MIB
   module that is compliant to the SMIv2, which is described in STD 58,
   RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580
   [RFC2580].

3. Overview

   The purpose of this MIB module is to provide the ability to configure
   and monitor the status of multicast address allocation within the
   local domain.

   Some important monitoring questions which can be answered by this MIB
   module include:

      o How full is scope X?

      o Who's using up the space?

      o Who allocated a given address A?

      o Are requests being met?

This MIB module is divided into two primary sections:

o Protocol-independent objects relevant to all multicast address
   allocation servers and clients.

o Protocol-specific objects related to the MADCAP client-server
   protocol.

3.1. Protocol-independent objects

The protocol-independent objects consist of one "capabilities" scalar
and five tables. The tables are:

o The Scope Table contains information on the multicast scopes
   known to a multicast address allocation server. This table
   allows configuring scopes, and viewing what scopes are known to
   the local system after being configured elsewhere.

o The Scope Name Table contains the names of the multicast
   scopes. This table logically extends the Scope Table with the
   list of scope names in various languages for each scope.

o The Allocation Range Table contains the address ranges out of
   which the device may allocate addresses. It also allows
   answering the questions "How full is scope X?" and "Are
   requests being met?"

o The Request Table contains the requests for address
   allocations, and allows answering the question "Who's using up
   the space?"

o The Address Table contains the blocks of addresses which have
   been allocated, and together with the Request Table, allows
   answering the question "Who allocated a given address A?"

3.2. Protocol-specific objects

The MADCAP objects consist of a group of (scalar) configuration
parameters, and a group of (scalar) statistics.

4. Definitions

```
MALLOC-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY, mib-2,
    Unsigned32, Gauge32, Counter32          FROM SNMPv2-SMI

    RowStatus, TruthValue, StorageType      FROM SNMPv2-TC

    MODULE-COMPLIANCE, OBJECT-GROUP         FROM SNMPv2-CONF

    InetAddress, InetAddressType            FROM INET-ADDRESS-MIB

    LanguageTag                             FROM IPMROUTE-STD-MIB

    SnmpAdminString                         FROM SNMP-FRAMEWORK-MIB

    IANAscopeSource, IANAmallocRangeSource FROM IANA-MALLOC-MIB;

mallocMIB MODULE-IDENTITY
    LAST-UPDATED "200306090000Z" -- June 9, 2003
    ORGANIZATION "IETF MALLOC Working Group"
    CONTACT-INFO
            " WG-EMail:   malloc@catarina.usc.edu
              Subscribe:  malloc-request@catarina.usc.edu
              Archive:    catarina.usc.edu/pub/multicast/malloc/

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    DESCRIPTION
            "The MIB module for management of multicast address
            allocation.

            Copyright (C) The Internet Society (2003).  This version of
            this MIB module is part of RFC 3559; see the RFC itself for
            full legal notices."
```

```
    -- revision log

    REVISION        "200306090000Z" -- June 9, 2003
    DESCRIPTION
            "Initial version, published as RFC 3559."
    ::= { mib-2 101 }

mallocMIBObjects OBJECT IDENTIFIER ::= { mallocMIB 1 }

malloc      OBJECT IDENTIFIER ::= { mallocMIBObjects 1 }

madcap      OBJECT IDENTIFIER ::= { mallocMIBObjects 2 }

--
-- scalars
--

mallocCapabilities OBJECT-TYPE
    SYNTAX      BITS {
                    startTime(0),
                    serverMobility(1),
                    retryAfter(2)
                }
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "This object describes the capabilities which a client or
            server supports.  The startTime bit indicates that
            allocations with a future start time are supported.  The
            serverMobility bit indicates that allocations can be renewed
            or released from a server other than the one granting the
            original allocation.  The retryAfter bit indicates support
            for a waiting state where the client may check back at a
            later time to get the status of its request."
    ::= { malloc 1 }

--
-- the Scope Table
--

mallocScopeTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MallocScopeEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
            "The (conceptual) table containing information on multicast
            scopes from which addresses may be allocated.  Entries in
            this table may be dynamically discovered via some other
```

                protocol, such as MZAP, or may be statically configured,
                such as in an isolated network environment. Each scope is
                associated with a range of multicast addresses, and ranges
                for different rows must be disjoint."
        ::= { malloc 2 }

mallocScopeEntry OBJECT-TYPE
        SYNTAX   MallocScopeEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
                "An entry (conceptual row) containing the information on a
                particular multicast scope."
        INDEX   { mallocScopeAddressType, mallocScopeFirstAddress }
        ::= { mallocScopeTable 1 }

MallocScopeEntry ::= SEQUENCE {
        mallocScopeAddressType   InetAddressType,
        mallocScopeFirstAddress   InetAddress,
        mallocScopeLastAddress   InetAddress,
        mallocScopeHopLimit   Unsigned32,
        mallocScopeStatus   RowStatus,
        mallocScopeSource   IANAscopeSource,
        mallocScopeDivisible   TruthValue,
        mallocScopeServerAddressType   InetAddressType,
        mallocScopeServerAddress   InetAddress,
        mallocScopeSSM   TruthValue,
        mallocScopeStorage   StorageType
}

mallocScopeAddressType OBJECT-TYPE
        SYNTAX   InetAddressType
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
                "The type of the addresses in the multicast scope range.
                Legal values correspond to the subset of address families
                for which multicast address allocation is supported."
        ::= { mallocScopeEntry 1 }

mallocScopeFirstAddress OBJECT-TYPE
        SYNTAX   InetAddress (SIZE(0..20))
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
                "The first address in the multicast scope range. The type
                of this address is determined by the value of the
                mallocScopeAddressType object."

```
    ::= { mallocScopeEntry 2 }

mallocScopeLastAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(0..20))
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The last address in the multicast scope range.  The type of
            this address is determined by the value of the
            mallocScopeAddressType object."
    ::= { mallocScopeEntry 3 }

mallocScopeHopLimit OBJECT-TYPE
    SYNTAX      Unsigned32 (0..255)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The default IPv4 TTL or IPv6 hop limit which applications
            should use for groups within the scope."
    DEFVAL      { 255 }
    ::= { mallocScopeEntry 4 }

mallocScopeStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The status of this row, by which new entries may be
            created, or old entries deleted from this table.  If write
            access is supported, the other writable objects in this
            table may be modified even while the status is `active'."
    ::= { mallocScopeEntry 5 }

mallocScopeSource OBJECT-TYPE
    SYNTAX      IANAscopeSource
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The method by which this entry was learned."
    ::= { mallocScopeEntry 6 }

mallocScopeDivisible OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "If false, the server may allocate addresses out of the
            entire range.  If true, the server must not allocate
```

                addresses out of the entire range, but may only allocate
                addresses out of a subrange learned via another method.
                Creating or deleting a scope which is not divisible has the
                side effect of creating or deleting the corresponding entry
                in the mallocAllocRangeTable. Deleting a scope which is
                divisible has the side effect of deleting any corresponding
                entries in the mallocAllocRangeTable, and the
                mallocRequestTable."
        DEFVAL   { false }
        ::= { mallocScopeEntry 7 }

mallocScopeServerAddressType OBJECT-TYPE
        SYNTAX   InetAddressType
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
                "The type of the address of a multicast address allocation
                server to which a request may be sent."
        DEFVAL { unknown }
        ::= { mallocScopeEntry 8 }

mallocScopeServerAddress OBJECT-TYPE
        SYNTAX   InetAddress
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
                "The address of a multicast address allocation server to
                which a request may be sent. The default value is an zero-
                length address, indicating that no server is known. The
                type of this address is determined by the value of the
                mallocScopeServerAddressType object."
        DEFVAL { ''h } -- the empty string
        ::= { mallocScopeEntry 9 }

mallocScopeSSM OBJECT-TYPE
        SYNTAX   TruthValue
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
                "Indicates whether the scope is a Source-Specific Multicast
                (SSM) range."
        DEFVAL   { false }
        ::= { mallocScopeEntry 10 }

mallocScopeStorage OBJECT-TYPE
        SYNTAX   StorageType
        MAX-ACCESS read-create
        STATUS   current

```
        DESCRIPTION
                "The storage type for this conceptual row.  Conceptual rows
                having the value 'permanent' need not allow write-access to
                any columnar objects in the row."
        DEFVAL     { nonVolatile }
        ::= { mallocScopeEntry 11 }

--
-- the Scope Name Table
--

mallocScopeNameTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MallocScopeNameEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
            "The (conceptual) table containing information on multicast
            scope names.  Entries in this table may be dynamically
            discovered via some other protocol, such as MZAP, or may be
            statically configured, such as in an isolated network
            environment."
    ::= { malloc 3 }

mallocScopeNameEntry OBJECT-TYPE
    SYNTAX      MallocScopeNameEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
            "An entry (conceptual row) containing the information on a
            particular multicast scope name."
    INDEX      { mallocScopeAddressType, mallocScopeFirstAddress,
                 IMPLIED mallocScopeNameLangName }
    ::= { mallocScopeNameTable 1 }

MallocScopeNameEntry ::= SEQUENCE {
    mallocScopeNameLangName           LanguageTag,
    mallocScopeNameScopeName          SnmpAdminString,
    mallocScopeNameDefault            TruthValue,
    mallocScopeNameStatus             RowStatus,
    mallocScopeNameStorage            StorageType
}

mallocScopeNameLangName OBJECT-TYPE
    SYNTAX      LanguageTag (SIZE(1..94))
    MAX-ACCESS not-accessible
    STATUS      current
```

```
    DESCRIPTION
            "The RFC 3066 language tag for the language of the scope
            name."
    ::= { mallocScopeNameEntry 1 }

mallocScopeNameScopeName OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The textual name associated with the multicast scope.  The
            value of this object should be suitable for displaying to
            end-users, such as when allocating a multicast address in
            this scope.  If the scope is an IPv4 scope, and no name is
            specified, the default value of this object should be the
            string 239.x.x.x/y with x and y replaced appropriately to
            describe the address and mask length associated with the
            scope.  If the scope is an IPv6 scope, and no name is
            specified, the default value of this object should
            generically describe the scope level (e.g., site)."
    ::= { mallocScopeNameEntry 2 }

mallocScopeNameDefault OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "If true, indicates a preference that the name in the
            associated language should be used by applications if no
            name is available in a desired language."
    DEFVAL      { false }
    ::= { mallocScopeNameEntry 3 }

mallocScopeNameStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The status of this row, by which new entries may be
            created, or old entries deleted from this table.  If write
            access is supported, the other writable objects in this
            table may be modified even while the status is `active'."
    ::= { mallocScopeNameEntry 4 }

mallocScopeNameStorage OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
```

```
        DESCRIPTION
                "The storage type for this conceptual row.  Conceptual rows
                having the value 'permanent' need not allow write-access to
                any columnar objects in the row."
        DEFVAL      { nonVolatile }
        ::= { mallocScopeNameEntry 5 }

--
-- the Allocation Range Table
--
mallocAllocRangeTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MallocAllocRangeEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
                "The (conceptual) table containing information on subranges
                of addresses from which the device may allocate addresses,
                if it is a MAAS.  If the device is a Prefix Coordinator, any
                ranges which the device is advertising to MAAS's will be in
                this table.  Note that the device may be both a MAAS and a
                Prefix Coordinator.

                Address ranges for different rows must be disjoint, and must
                be contained with the address range of the corresponding row
                of the mallocScopeTable.

                Deleting an allocation range has the side effect of deleting
                any entries within that range from the mallocAddressTable."
        ::= { malloc 4 }

mallocAllocRangeEntry OBJECT-TYPE
    SYNTAX      MallocAllocRangeEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
                "An entry (conceptual row) containing the information on a
                particular allocation range."
        INDEX      { mallocScopeAddressType, mallocScopeFirstAddress,
                    mallocAllocRangeFirstAddress }
        ::= { mallocAllocRangeTable 1 }

MallocAllocRangeEntry ::= SEQUENCE {
    mallocAllocRangeFirstAddress            InetAddress,
    mallocAllocRangeLastAddress             InetAddress,
    mallocAllocRangeStatus                  RowStatus,
    mallocAllocRangeSource                  IANAmallocRangeSource,
    mallocAllocRangeLifetime                Unsigned32,
    mallocAllocRangeMaxLeaseAddrs           Unsigned32,
```

```
    mallocAllocRangeMaxLeaseTime          Unsigned32,
    mallocAllocRangeNumAllocatedAddrs     Gauge32,
    mallocAllocRangeNumOfferedAddrs       Gauge32,
    mallocAllocRangeNumWaitingAddrs       Gauge32,
    mallocAllocRangeNumTryingAddrs        Gauge32,
    mallocAllocRangeAdvertisable          TruthValue,
    mallocAllocRangeTotalAllocatedAddrs Gauge32,
    mallocAllocRangeTotalRequestedAddrs Gauge32,
    mallocAllocRangeStorage               StorageType
}

mallocAllocRangeFirstAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(0..20))
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
            "The first address in the allocation range.  The type of
            this address is determined by the value of the
            mallocScopeAddressType object."
    ::= { mallocAllocRangeEntry 1 }

mallocAllocRangeLastAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(0..20))
    MAX-ACCESS read-create
    STATUS      current
    DESCRIPTION
            "The last address in the allocation range.  The type of this
            address is determined by the value of the
            mallocScopeAddressType object."
    ::= { mallocAllocRangeEntry 2 }

mallocAllocRangeStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS read-create
    STATUS      current
    DESCRIPTION
            "The status of this row, by which new entries may be
            created, or old entries deleted from this table.  If write
            access is supported, the other writable objects in this
            table may be modified even while the status is `active'."
    ::= { mallocAllocRangeEntry 3 }

mallocAllocRangeSource OBJECT-TYPE
    SYNTAX      IANAmallocRangeSource
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The means by which this entry was learned."
```

```
     ::= { mallocAllocRangeEntry 4 }

mallocAllocRangeLifetime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS read-create
    STATUS      current
    DESCRIPTION
            "The number of seconds remaining in the lifetime of the
            (sub)range out of which addresses are being allocated.  A
            value of 0 indicates that the range is not subject to
            aging."
    DEFVAL      { 0 }
    ::= { mallocAllocRangeEntry 5 }

mallocAllocRangeMaxLeaseAddrs OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS read-create
    STATUS      current
    DESCRIPTION
            "The maximum number of addresses which the server is willing
            to grant for each future request in this range.  A value of
            0 means that no specific limit is enforced, as long as the
            server has valid addresses to allocate."
    DEFVAL { 0 }
    ::= { mallocAllocRangeEntry 6 }

mallocAllocRangeMaxLeaseTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS read-create
    STATUS      current
    DESCRIPTION
            "The maximum lifetime which the server will grant for future
            requests in this range.  A value of 0 means that no
            additional limit is enforced beyond that of
            mallocAllocRangeLifetime."
    DEFVAL { 0 }
    ::= { mallocAllocRangeEntry 7 }

mallocAllocRangeNumAllocatedAddrs OBJECT-TYPE
    SYNTAX      Gauge32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of addresses in the range which have been
            allocated.  This value can be used to determine the current
            address space utilization within the scoped range.  This
```

                should match the total number of addresses for this scope
                covered by entries in the mallocAddressTable."
        ::= { mallocAllocRangeEntry 8 }

mallocAllocRangeNumOfferedAddrs OBJECT-TYPE
        SYNTAX   Gauge32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
                "The number of addresses in the range which have been
                offered. This number should match the sum of
                mallocRequestNumAddrs for all entries in the
                mallocRequestTable in the offered state. Together with
                mallocAllocRangeNumAllocatedAddrs and
                mallocAllocRangeNumTryingAddrs, this can be used to
                determine the address space utilization within the scoped
                range in the immediate future."
        ::= { mallocAllocRangeEntry 9 }

mallocAllocRangeNumWaitingAddrs OBJECT-TYPE
        SYNTAX   Gauge32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
                "The number of addresses in the range which have been
                requested, but whose state is waiting, while the server
                attempts to acquire more address space."
        ::= { mallocAllocRangeEntry 10 }

mallocAllocRangeNumTryingAddrs OBJECT-TYPE
        SYNTAX   Gauge32
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
                "The number of addresses in the scope covered by entries in
                the mallocRequestTable in the trying state."
        ::= { mallocAllocRangeEntry 11 }

mallocAllocRangeAdvertisable OBJECT-TYPE
        SYNTAX   TruthValue
        MAX-ACCESS read-create
        STATUS   current
        DESCRIPTION
                "The value of this object is true if the range is eligible
                to be advertised to other MAASs. When the row is first
                created, the default value of this object is true if the
                scope is divisible, and is false otherwise."
        ::= { mallocAllocRangeEntry 12 }

mallocAllocRangeTotalAllocatedAddrs OBJECT-TYPE
    SYNTAX   Gauge32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The approximate number of addresses in the range which have
            been allocated by any MAAS, as determined by a Prefix
            Coordinator. This object need only be present if
            mallocAllocRangeAdvertisable is true. If the number is
            unknown, a value of 0 may be reported."
    ::= { mallocAllocRangeEntry 13 }

mallocAllocRangeTotalRequestedAddrs OBJECT-TYPE
    SYNTAX   Gauge32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The approximate number of addresses in the range for which
            there is potential demand among MAASs, as determined by a
            Prefix Coordinator. This object need only be present if
            mallocAllocRangeAdvertisable is true. If the number is
            unknown, a value of 0 may be reported."
    ::= { mallocAllocRangeEntry 14 }

mallocAllocRangeStorage OBJECT-TYPE
    SYNTAX   StorageType
    MAX-ACCESS read-create
    STATUS   current
    DESCRIPTION
            "The storage type for this conceptual row. Conceptual rows
            having the value 'permanent' need not allow write-access to
            any columnar objects in the row."
    DEFVAL   { nonVolatile }
    ::= { mallocAllocRangeEntry 15 }

--
-- the Request Table
--

mallocRequestTable OBJECT-TYPE
    SYNTAX   SEQUENCE OF MallocRequestEntry
    MAX-ACCESS not-accessible
    STATUS   current
    DESCRIPTION
            "The (conceptual) table containing information on allocation
            requests, whether allocated or in progress. This table may
            also be used to determine which clients are responsible for
            high address space utilization within a given scope.

```
            Entries in this table reflect requests dynamically received
            by an address allocation protocol."
    ::= { malloc 5 }

mallocRequestEntry OBJECT-TYPE
    SYNTAX      MallocRequestEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "An entry (conceptual row) containing the information on a
            particular allocation request."
    INDEX       { mallocRequestId }
    ::= { mallocRequestTable 1 }

MallocRequestEntry ::= SEQUENCE {
    mallocRequestId                     Unsigned32,
    mallocRequestScopeAddressType       InetAddressType,
    mallocRequestScopeFirstAddress      InetAddress,
    mallocRequestStartTime              Unsigned32,
    mallocRequestEndTime                Unsigned32,
    mallocRequestNumAddrs               Unsigned32,
    mallocRequestState                  INTEGER,
    mallocRequestClientAddressType      InetAddressType,
    mallocRequestClientAddress          InetAddress,
    mallocRequestServerAddressType      InetAddressType,
    mallocRequestServerAddress          InetAddress,
    mallocRequestLeaseIdentifier        OCTET STRING
}

mallocRequestId OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "An arbitrary value identifying this row."
    ::= { mallocRequestEntry 1 }

mallocRequestScopeAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The type of the first address of the scope to which the
            request applies.  Legal values correspond to the subset of
            address families for which multicast address allocation is
            supported."
    ::= { mallocRequestEntry 2 }
```

mallocRequestScopeFirstAddress OBJECT-TYPE
    SYNTAX   InetAddress
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The first address of the scope to which the request
            applies. This must match mallocScopeFirstAddress for some
            row in the mallocScopeTable. The type of this address is
            determined by the value of the mallocRequestScopeAddressType
            object."
    ::= { mallocRequestEntry 3 }

mallocRequestStartTime OBJECT-TYPE
    SYNTAX   Unsigned32
    UNITS   "seconds"
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The number of seconds remaining before the start time of
            the request. A value of 0 means that the allocation is
            currently in effect."
    ::= { mallocRequestEntry 4 }

mallocRequestEndTime OBJECT-TYPE
    SYNTAX   Unsigned32
    UNITS   "seconds"
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The number of seconds remaining before the end time of the
            request."
    ::= { mallocRequestEntry 5 }

mallocRequestNumAddrs OBJECT-TYPE
    SYNTAX   Unsigned32
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The number of addresses requested. If the addresses have
            been allocated, this number should match the total number of
            addresses for this request covered by entries in the
            mallocAddressTable."
    ::= { mallocRequestEntry 6 }

mallocRequestState OBJECT-TYPE
    SYNTAX   INTEGER {
                allocated(1),
                offered(2),   -- tentatively allocated

                        waiting(3),   -- waiting for more space
                        trying(4)   -- working on allocating
                    }
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The state of the request. A value of allocated(1)
            indicates that one or more entries for this request are
            present in the mallocAddressTable. A value of offered(2)
            indicates that addresses have been offered to the client
            (e.g. via a MADCAP OFFER message), but the allocation has
            not been committed. A value of waiting(3) indicates that
            the allocation is blocked while the server attempts to
            acquire more space from which it can allocate addresses. A
            value of trying(4) means that no addresses have been offered
            to the client, but that an attempt to allocate is in
            progress."
    ::= { mallocRequestEntry 7 }

mallocRequestClientAddressType OBJECT-TYPE
    SYNTAX   InetAddressType
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The type of the address of the client that (last) requested
            this allocation."
    ::= { mallocRequestEntry 8 }

mallocRequestClientAddress OBJECT-TYPE
    SYNTAX   InetAddress
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The address of the client that (last) requested this
            allocation. The type of this address is determined by the
            value of the mallocRequestClientAddressType object."
    ::= { mallocRequestEntry 9 }

mallocRequestServerAddressType OBJECT-TYPE
    SYNTAX   InetAddressType
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
            "The type of the address of the server to which the request
            was (last) sent."
    ::= { mallocRequestEntry 10 }

```
mallocRequestServerAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The address of the server to which the request was (last)
            sent.  The type of this address is determined by the value
            of the mallocRequestServerAddressType object."
    ::= { mallocRequestEntry 11 }

mallocRequestLeaseIdentifier OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..255))
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The Lease Identifier of this request.  If the allocation
            mechanism in use does not use Lease Identifiers, then the
            value is a 0-length string."
    ::= { mallocRequestEntry 12 }

--
-- the Address Table
--

mallocAddressTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MallocAddressEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
            "The (conceptual) table containing information on blocks of
            allocated addresses.  This table may be used to map a given
            multicast group address to the associated request."
    ::= { malloc 6 }

mallocAddressEntry OBJECT-TYPE
    SYNTAX      MallocAddressEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
            "An entry (conceptual row) containing the information on a
            particular block of allocated addresses.  The block of
            addresses covered by each entry in this table must fall
            within a range corresponding to an entry in the
            mallocAllocRangeTable."
    INDEX      { mallocAddressAddressType, mallocAddressFirstAddress }
    ::= { mallocAddressTable 1 }
```

```
MallocAddressEntry ::= SEQUENCE {
    mallocAddressAddressType                InetAddressType,
    mallocAddressFirstAddress               InetAddress,
    mallocAddressNumAddrs                   Unsigned32,
    mallocAddressRequestId                  Unsigned32
}

mallocAddressAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The type of the first address in the allocated block.
            Legal values correspond to the subset of address families
            for which multicast address allocation is supported."
    ::= { mallocAddressEntry 1 }

mallocAddressFirstAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(0..20))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The first address in the allocated block.  The type of this
            address is determined by the value of the
            mallocAddressAddressType object."
    ::= { mallocAddressEntry 2 }

mallocAddressNumAddrs OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of addresses in the allocated block."
    ::= { mallocAddressEntry 3 }

mallocAddressRequestId OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The index of the request which caused this block of
            addresses to be allocated.  This value must match the value
            of mallocRequestId for some entry in the
            mallocRequestTable."
    ::= { mallocAddressEntry 4 }

--
-- MADCAP-specific objects
```

```
--

madcapConfig OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
            "Group of objects that count various MADCAP events."
    ::= { madcap 1 }

madcapConfigExtraAllocationTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS read-write
    STATUS      current
    DESCRIPTION
            "The amount of extra time on either side of a lease which
            the MADCAP server allocates to allow for clock skew among
            clients."
    ::= { madcapConfig 1 }

madcapConfigNoResponseDelay OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS read-write
    STATUS      current
    DESCRIPTION
            "The amount of time the MADCAP client allows for receiving a
            response from a MADCAP server."
    ::= { madcapConfig 2 }

madcapConfigOfferHold OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS read-write
    STATUS      current
    DESCRIPTION
            "The amount of time the MADCAP server will reserve an
            address for after sending an OFFER message in anticipation
            of receiving a REQUEST message."
    ::= { madcapConfig 3 }

madcapConfigResponseCacheInterval OBJECT-TYPE
    SYNTAX      Unsigned32 (0..300)
    UNITS       "seconds"
    MAX-ACCESS read-write
    STATUS      current
    DESCRIPTION
            "The amount of time the MADCAP server uses to detect
            duplicate messages."
```

```
     ::= { madcapConfig 4 }

madcapConfigClockSkewAllowance OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS read-write
    STATUS      current
    DESCRIPTION
            "The clock skew threshold used by the MADCAP server to
            generate Excessive Clock Skew errors."
    ::= { madcapConfig 5 }

madcapCounters OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
            "A group of objects that count various MADCAP events."
    ::= { madcap 2 }

madcapTotalErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The total number of transactions for which the MADCAP
            server has detected an error of any type, regardless of
            whether the server ignored the request or generated a NAK."
    ::= { madcapCounters 1 }

madcapRequestsDenied OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of valid requests for which the MADCAP server
            could not complete an allocation, regardless of whether NAKs
            were sent.  This corresponds to the Valid Request Could Not
            Be Completed error code in MADCAP."
    ::= { madcapCounters 2 }

madcapInvalidRequests OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of invalid requests received by the MADCAP
            server, regardless of whether NAKs were sent.  This
            corresponds to the Invalid Request error code in MADCAP."
    ::= { madcapCounters 3 }
```

```
madcapExcessiveClockSkews OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of requests received by the MADCAP server with
            an excessive clock skew, regardless of whether NAKs were
            sent.  This corresponds to the Excessive Clock Skew error
            code in MADCAP."
    ::= { madcapCounters 4 }

madcapBadLeaseIds OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of requests received by the MADCAP server with
            an unrecognized Lease Identifier, regardless of whether NAKs
            were sent.  This corresponds to the Lease Identifier Not
            Recognized error code in MADCAP."
    ::= { madcapCounters 5 }

madcapDiscovers OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of DISCOVER messages received by the MADCAP
            server."
    ::= { madcapCounters 6 }

madcapInforms OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of INFORM messages received by the MADCAP
            server."
    ::= { madcapCounters 7 }

madcapRequests OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
            "The number of REQUEST messages received by the MADCAP
            server."
    ::= { madcapCounters 8 }
```

```
madcapRenews OBJECT-TYPE
     SYNTAX      Counter32
     MAX-ACCESS read-only
     STATUS      current
     DESCRIPTION
             "The number of RENEW messages received by the MADCAP
             server."
     ::= { madcapCounters 9 }

madcapReleases OBJECT-TYPE
     SYNTAX      Counter32
     MAX-ACCESS read-only
     STATUS      current
     DESCRIPTION
             "The number of RELEASE messages received by the MADCAP
             server."
     ::= { madcapCounters 10 }


-- conformance information

mallocConformance  OBJECT IDENTIFIER ::= { mallocMIB 2 }
mallocCompliances  OBJECT IDENTIFIER ::= { mallocConformance 1 }
mallocGroups       OBJECT IDENTIFIER ::= { mallocConformance 2 }

-- compliance statements

mallocServerReadOnlyCompliance MODULE-COMPLIANCE
     STATUS  current
     DESCRIPTION
             "The compliance statement for multicast address allocation
             servers implementing the MALLOC MIB without support for
             read-create (i.e., in read-only mode).  Such a server can
             then be monitored but can not be configured with this MIB."
     MODULE  -- this module
     MANDATORY-GROUPS { mallocBasicGroup,
                        mallocServerGroup }

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

        GROUP   madcapServerGroup
        DESCRIPTION
                "This group is mandatory for servers which implement the
                MADCAP client-server protocol."

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

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

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

```
        OBJECT          madcapConfigClockSkewAllowance
        MIN-ACCESS  read-only
        DESCRIPTION
            "Write access is not required."
    ::= { mallocCompliances 1 }

mallocClientReadOnlyCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for clients implementing the
            MALLOC MIB without support for read-create (i.e., in read-
            only mode).  Such clients can then be monitored but can not
            be configured with this MIB."
    MODULE  -- this module
    MANDATORY-GROUPS { mallocBasicGroup,
                       mallocClientGroup }

    GROUP   mallocClientScopeGroup
    DESCRIPTION
            "This group is mandatory for clients which maintain a list
            of multicast scopes."

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

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

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

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

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

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

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

      GROUP   madcapClientGroup
      DESCRIPTION
                "This group is mandatory for clients which implement the
                MADCAP client-server protocol."

            OBJECT        madcapConfigNoResponseDelay
            MIN-ACCESS    read-only
            DESCRIPTION
                "Write access is not required."
     ::= { mallocCompliances 2 }

mallocPrefixCoordinatorReadOnlyCompliance MODULE-COMPLIANCE
      STATUS  current
      DESCRIPTION
                "The compliance statement for prefix coordinators
                implementing the MALLOC MIB without support for read-create
                (i.e., in read-only mode).  Such devices can then be
                monitored but can not be configured with this MIB."
      MODULE  -- this module
      MANDATORY-GROUPS { mallocBasicGroup,
                         mallocPrefixCoordinatorGroup }

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

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

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

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

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

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

            OBJECT       mallocAllocRangeStorage
            MIN-ACCESS   read-only
            DESCRIPTION
                "Write access is not required."
      ::= { mallocCompliances 3 }

mallocServerFullCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
                "The compliance statement for multicast address allocation
                servers implementing the MALLOC MIB with support for read-
                create.  Such servers can then be both monitored and
                configured with this MIB."
        MODULE  -- this module
        MANDATORY-GROUPS { mallocBasicGroup,
                           mallocServerGroup }

        GROUP   madcapServerGroup
        DESCRIPTION
                "This group is mandatory for servers which implement the
                MADCAP client-server protocol."
      ::= { mallocCompliances 4 }

mallocClientFullCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
                "The compliance statement for hosts implementing the MALLOC
                MIB with support for read-create.  Such clients can then be
                both monitored and configured with this MIB."
        MODULE  -- this module
        MANDATORY-GROUPS { mallocBasicGroup,
                           mallocClientGroup }
```

        GROUP   mallocClientScopeGroup
        DESCRIPTION
                "This group is mandatory for clients which maintain a list
                of multicast scopes."

        GROUP   madcapClientGroup
        DESCRIPTION
                "This group is mandatory for clients which implement the
                MADCAP client-server protocol."
     ::= { mallocCompliances 5 }

mallocPrefixCoordinatorFullCompliance MODULE-COMPLIANCE
     STATUS current
     DESCRIPTION
             "The compliance statement for prefix coordinators
             implementing the MALLOC MIB with support for read-create.
             Such devices can then be both monitored and configured with
             this MIB."
     MODULE -- this module
     MANDATORY-GROUPS { mallocBasicGroup,
                        mallocPrefixCoordinatorGroup }
     ::= { mallocCompliances 6 }

-- units of conformance

mallocBasicGroup OBJECT-GROUP
        OBJECTS { mallocCapabilities, mallocRequestScopeAddressType,
                mallocRequestScopeFirstAddress,
                mallocRequestStartTime,
                mallocRequestEndTime, mallocRequestNumAddrs,
                mallocRequestState,
                mallocAddressNumAddrs, mallocAddressRequestId
                  }
        STATUS current
        DESCRIPTION
            "The basic collection of objects providing management of IP
            multicast address allocation."
     ::= { mallocGroups 1 }

mallocServerGroup OBJECT-GROUP
        OBJECTS { mallocScopeLastAddress, mallocScopeHopLimit,
                mallocScopeSSM, mallocScopeStatus, mallocScopeStorage,
                mallocAllocRangeLastAddress, mallocAllocRangeLifetime,
                mallocAllocRangeNumAllocatedAddrs,
                mallocAllocRangeNumOfferedAddrs,
                mallocAllocRangeNumWaitingAddrs,
                mallocAllocRangeNumTryingAddrs,
                mallocAllocRangeMaxLeaseAddrs,

```
                    mallocAllocRangeMaxLeaseTime, mallocAllocRangeSource,
                    mallocAllocRangeStatus, mallocAllocRangeStorage,
                    mallocScopeDivisible, mallocScopeSource,
                    mallocScopeNameScopeName, mallocScopeNameDefault,
                    mallocScopeNameStatus, mallocScopeNameStorage,
                    mallocRequestClientAddressType,
                    mallocRequestClientAddress
                  }
         STATUS   current
         DESCRIPTION
             "A collection of objects providing management of multicast
             address allocation in servers."
     ::= { mallocGroups 2 }

mallocClientGroup OBJECT-GROUP
         OBJECTS { mallocRequestServerAddressType,
                    mallocRequestServerAddress }
         STATUS   current
         DESCRIPTION
             "A collection of objects providing management of multicast
             address allocation in clients."
     ::= { mallocGroups 3 }

madcapServerGroup OBJECT-GROUP
         OBJECTS { madcapConfigClockSkewAllowance,
             madcapConfigExtraAllocationTime, madcapConfigOfferHold,
             madcapConfigResponseCacheInterval,
             madcapTotalErrors, madcapRequestsDenied,
             madcapInvalidRequests, madcapBadLeaseIds,
             madcapExcessiveClockSkews, madcapDiscovers,
             madcapInforms, madcapRequests,
             madcapRenews, madcapReleases }
         STATUS   current
         DESCRIPTION
             "A collection of objects providing management of MADCAP
             servers."
     ::= { mallocGroups 4 }

madcapClientGroup OBJECT-GROUP
     OBJECTS { mallocRequestLeaseIdentifier,
             madcapConfigNoResponseDelay }
      STATUS   current
      DESCRIPTION
             "A collection of objects providing management of MADCAP
             clients."
     ::= { mallocGroups 5 }
```

```
mallocClientScopeGroup OBJECT-GROUP
    OBJECTS { mallocScopeLastAddress, mallocScopeHopLimit,
            mallocScopeStatus, mallocScopeStorage, mallocScopeSource,
            mallocScopeServerAddressType, mallocScopeServerAddress,
            mallocScopeSSM, mallocScopeNameScopeName,
            mallocScopeNameDefault, mallocScopeNameStatus,
            mallocScopeNameStorage }
    STATUS  current
    DESCRIPTION
            "A collection of objects providing management of multicast
            scope information in clients."
    ::= { mallocGroups 6 }

mallocPrefixCoordinatorGroup OBJECT-GROUP
    OBJECTS { mallocAllocRangeLastAddress, mallocAllocRangeLifetime,
            mallocAllocRangeStatus, mallocAllocRangeStorage,
            mallocAllocRangeSource,
            mallocAllocRangeTotalAllocatedAddrs,
            mallocAllocRangeTotalRequestedAddrs,
            mallocAllocRangeAdvertisable, mallocScopeLastAddress,
            mallocScopeDivisible, mallocScopeSource }
    STATUS  current
    DESCRIPTION
            "A collection of objects for managing Prefix Coordinators."
    ::= { mallocGroups 7 }
END
```

5. IANA Considerations

   The IANAscopeSource and IANAmallocRangeSource textual conventions are
   imported from the IANA-MALLOC-MIB. The purpose of defining these
   textual conventions in a separate MIB module is to allow additional
   values to be defined without having to issue a new version of this
   document. The Internet Assigned Numbers Authority (IANA) is
   responsible for the assignment of all Internet numbers, including
   various SNMP-related numbers; it will administer the values
   associated with these textual conventions.

   The rules for additions or changes to the IANA-MALLOC-MIB are
   outlined in the DESCRIPTION clause associated with its MODULE-
   IDENTITY statement.

   The current versions of the IANA-MALLOC-MIB can be accessed from the
   IANA home page at: "http://www.iana.org/".

6. Security Considerations

   There are a number of management objects defined in this MIB module
   with a MAX-ACCESS clause of read-write and/or read-create. Such
   objects 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. These are the tables and objects and their
   sensitivity/vulnerability:

   mallocScopeTable,mallocAllocRangeTable:
      Unauthorized modifications to these tables can result in denial of
      service by not being able to allocate and use multicast addresses,
      allocating too many addresses, allocating addresses that other
      organizations are already using, or causing applications to use a
      hop limit that results in extra bandwidth usage.

   mallocScopeNameTable:
      Unauthorized modifications to this table can result in incorrect
      or misleading scope names being presented to users, resulting in
      potentially using the wrong scope for application data.

   madcapConfigExtraAllocationTime,madcapConfigOfferHold:
      Unauthorized modifications to these objects can result in
      reservations lasting too long, potentially resulting in denial of
      service if allocation ranges are small.

   madcapConfigNoResponseDelay:
      Unauthorized modifications can result in a client not being able
      to allocate multicast addresses.

   Some of the readable objects in this MIB module (i.e., objects with a
   MAX-ACCESS other than not-accessible) may be considered sensitive or
   vulnerable in some network environments. It is thus important to
   control GET and/or NOTIFY access to these objects and possibly to
   encrypt the values of these objects when sending them over the
   network via SNMP. These are the tables and objects and their
   sensitivity/vulnerability:

   mallocRequestLeaseIdentifier:
      If address allocation servers are configured to allow renewal or
      release purely on the basis of knowledge of the Lease Identifier,
      then unauthorized read access to mallocRequestLeaseIdentifier can
      be used in a denial-of-service attack.

   SNMP versions prior to SNMPv3 did not include adequate security.
   Even if the network itself is secure (for example by using IPSec),
   there is no control as to who on the secure network is allowed to

access and GET/SET (read/change/create/delete) the objects in this
MIB module.

It is RECOMMENDED that implementers consider the security features as
provided by the SNMPv3 framework (see [RFC3410], section 8),
including full support for the SNMPv3 cryptographic mechanisms (for
authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT
RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to
enable cryptographic security. It is then a customer/operator
responsibility to ensure that the SNMP entity giving access to an
instance of this MIB module is properly configured for only those
principals (users) with legitimate rights to have access to GET or
SET (change/create/delete) objects.

7. Acknowledgements

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Multicast Address Allocation (MALLOC) Working Group. Lars Viklund,
Frank Strauss, and Mike Heard provided helpful feedback on this
document.

8. Intellectual Property Statement

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11. Full Copyright Statement

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