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## Multicast Group Membership Discovery 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 objects used for managing the Internet Group Management Protocol (IGMP) and the Multicast Listener Discovery (MLD) protocol.

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## 1. Introduction

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 objects used for managing the Internet Group Management Protocol (IGMP) version 1 [RFC1112], version 2 [RFC2236], or version 3 [RFC3376] and the Multicast Listener Discovery (MLD) protocol version 1 [RFC2710] or version 2 [RFC3810]. Both protocols provide multicast membership discovery capability. IGMP pertains to IP version 4 clients, and MLD to IP version 6 clients. This version of the MIB obsoletes both RFC 2933 [RFC2933] and RFC 3019 [RFC3019], incorporating a generic interface for both IGMP and MLD implementations and incorporating changes to enable "source filtering" in multicast clients. The MIB encompasses both router and host nodes with relevant management objects defined for each.

## 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. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

### 4. Overview

This Multicast Group Membership Discovery (MGMD) MIB module contains eight tables:

1. the MGMD Host Interface Table, which contains one row for each interface on which IGMP or MLD is enabled on a host,
2. the MGMD Router Interface Table, which contains one row for each interface on which MGMD is enabled on a router,
3. the MGMD Host Cache Table, which contains one row for each IP multicast group for which there are members on a particular interface on a host,
4. the MGMD Router Cache Table, which contains one row for each IP multicast group for which there are members on a particular interface on a router,
5. the reverse MGMD Host Table, which contains one row for each interface for which there are active multicast groups on a host,
6. the reverse MGMD Router Table, which contains one row for each interface for which there are active multicast groups on a router,
7. the MGMD HostSrcList Table, which contains one row for each entry in the source filter record for an interface and multicast group pair on a host, and
8. the MGMD RouterSrcList Table, which contains one row for each entry in the source filter record for an interface and multicast group pair on a router.

All tables are intended for EITHER router OR host functionality as indicated by the name and corresponding description, although it is anticipated that there will be scenarios where both terms might apply to a device, e.g., a router that joins a multicast group also as a host for measurement purposes. The source list tables provide an extension to the cache tables to indicate the source-specific

includes or excludes associated with each IP multicast group on each specific interface. This functionality is only supported in IGMPv3- and MLDv2-capable nodes.

Incorporated within the MGMD MIB tables are objects for the management of IGMP and MLD proxy devices as described in RFC 4605 [RFC4605]. Proxy devices can be used in simple topologies where it is not necessary to run a full multicast routing protocol. A proxy device can make forwarding decisions based on IGMP or MLD group membership activity.

The MIB references InterfaceIndex and InterfaceIndexOrZero objects as defined in RFC 2863 [RFC2863], the MIB that describes generic objects for network interface sub-layers.

Extensive references to the InetAddress and InetAddressType objects are made as defined in RFC 4001 [RFC4001].

## 5. Definitions

MGMD-STD-MIB DEFINITIONS ::= BEGIN

### IMPORTS

```
MODULE-IDENTITY, OBJECT-TYPE, mib-2, Counter32, Gauge32,
Unsigned32, TimeTicks          FROM SNMPv2-SMI
InetAddress, InetAddressType   FROM INET-ADDRESS-MIB
RowStatus                      FROM SNMPv2-TC
MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF
InterfaceIndexOrZero,
InterfaceIndex                  FROM IF-MIB;
```

mgmdStdMIB MODULE-IDENTITY

```
LAST-UPDATED "200903300000Z" -- March 30, 2009
ORGANIZATION "INTERNET ENGINEERING TASK FORCE MULTICAST and
ANYCAST GROUP MEMBERSHIP Working
Group.
www: http://www.ietf.org/html.charters/magma-charter.html
Email: magma@ietf.org"
```

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```

## DESCRIPTION

"The MIB module for MGMD management.

A new version of MGMD combining RFC 2933 and RFC 3019.

Includes IGMPv3 and MLDv2 source filtering changes.

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OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE,  
EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This version of this MIB module is part of RFC 5519;  
see the RFC itself for full legal notices."

REVISION "200903300000Z" -- March 30, 2009

## DESCRIPTION

"This MIB obsoletes both RFC 2933 and RFC 3019."

::= { mib-2 185 }

```
mgmdMIBObjects      OBJECT IDENTIFIER ::= { mgmdStdMIB 1 }
```

```
--
-- The MGMD Host Interface Table
--
```

```
mgmdHostInterfaceTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MgmdHostInterfaceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the interfaces on which
        IGMP or MLD is enabled."

    ::= { mgmdMIBObjects 1 }
```

```
mgmdHostInterfaceEntry OBJECT-TYPE
    SYNTAX      MgmdHostInterfaceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) representing an interface on
        which IGMP or MLD is enabled."
    INDEX       { mgmdHostInterfaceIfIndex,
                  mgmdHostInterfaceQuerierType }

    ::= { mgmdHostInterfaceTable 1 }
```

```
MgmdHostInterfaceEntry ::= SEQUENCE {
    mgmdHostInterfaceIfIndex      InterfaceIndex,
    mgmdHostInterfaceQuerierType  InetAddressType,
    mgmdHostInterfaceQuerier      InetAddress,
    mgmdHostInterfaceStatus       RowStatus,
    mgmdHostInterfaceVersion      Unsigned32,
    mgmdHostInterfaceVersion1QuerierTimer  TimeTicks,
    mgmdHostInterfaceVersion2QuerierTimer  TimeTicks,
    mgmdHostInterfaceVersion3Robustness    Unsigned32
}
```

```
mgmdHostInterfaceIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ifIndex value of the interface for which IGMP or MLD is
        enabled. The table is indexed by the ifIndex value and the
        InetAddressType to allow for interfaces that may be
        configured in both IPv4 and IPv6 modes."
```

```
::= { mgmdHostInterfaceEntry 1 }
```

mgmdHostInterfaceQuerierType OBJECT-TYPE

SYNTAX InetAddressType { ipv4(1), ipv6(2) }

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address type of this interface. This entry along with the ifIndex value acts as an index to the mgmdHostInterface table. A physical interface may be configured in multiple modes concurrently, e.g., in IPv4 and IPv6 modes connected to the same interface; however, the traffic is considered to be logically separate."

```
::= { mgmdHostInterfaceEntry 2 }
```

mgmdHostInterfaceQuerier OBJECT-TYPE

SYNTAX InetAddress (SIZE(4|16))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address of the IGMP or MLD Querier on the IP subnet to which this interface is attached. The InetAddressType, e.g., IPv4 or IPv6, is identified by the mgmdHostInterfaceQuerierType variable in the mgmdHostInterface table."

```
::= { mgmdHostInterfaceEntry 3 }
```

mgmdHostInterfaceStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The activation of a row enables the host side of IGMP or MLD on the interface. The destruction of a row disables the host side of IGMP or MLD on the interface."

```
::= { mgmdHostInterfaceEntry 4 }
```

mgmdHostInterfaceVersion OBJECT-TYPE

SYNTAX Unsigned32 (1..3)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum version of MGMD that the host can run on this interface. A value of 1 is only applicable for IPv4, and indicates that the host only supports IGMPv1 on the

interface. A value of 2 indicates that the host also supports IGMPv2 (for IPv4) or MLDv1 (for IPv6). A value of 3 indicates that the host also supports IGMPv3 (for IPv4) or MLDv2 (for IPv6)."

DEFVAL { 3 }

::= { mgmdHostInterfaceEntry 5 }

mgmdHostInterfaceVersion1QuerierTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining until the host assumes that there are no IGMPv1 routers present on the interface. While this is non-zero, the host will reply to all queries with version 1 membership reports. This variable applies to IGMPv2 or 3 hosts that are forced to run in v1 for compatibility with v1 routers present on the interface. This object may only be present when the corresponding value of mgmdHostInterfaceQuerierType is ipv4."

REFERENCE "RFC 2236, Section 4 and RFC 3376, Section 7.2.1"

DEFVAL { 0 }

::= { mgmdHostInterfaceEntry 6 }

mgmdHostInterfaceVersion2QuerierTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining until the host assumes that there are no MGMDv2 routers present on the interface. While this is non-zero, the host will reply to all queries with version 1 or 2 membership reports. This variable applies to MGMDv3 hosts that are forced to run in v2 for compatibility with v2 hosts or routers present on the interface."

REFERENCE "RFC 3376, Section 7.2.1 and RFC 3810, Section 8.2.1"

DEFVAL { 0 }

::= { mgmdHostInterfaceEntry 7 }

mgmdHostInterfaceVersion3Robustness OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current



## DESCRIPTION

"The robustness variable utilised by an MGMDv3 host in sending state-change reports for multicast routers. To ensure the state-change report is not missed, the host retransmits the state-change report [mgmdHostInterfaceVersion3Robustness - 1] times. The variable must be a non-zero value."

REFERENCE "RFC 3376, Section 8.1 and RFC 3810, Section 9.14.1"

DEFVAL { 2 }

::= { mgmdHostInterfaceEntry 8 }

--

-- The MGMD Router Interface Table

--

mgmdRouterInterfaceTable OBJECT-TYPE

SYNTAX SEQUENCE OF MgmdRouterInterfaceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The (conceptual) table listing the interfaces on which IGMP or MLD is enabled."

::= { mgmdMIBObjects 2 }

mgmdRouterInterfaceEntry OBJECT-TYPE

SYNTAX MgmdRouterInterfaceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) representing an interface on which IGMP or MLD is enabled."

INDEX { mgmdRouterInterfaceIfIndex,  
mgmdRouterInterfaceQuerierType }

::= { mgmdRouterInterfaceTable 1 }

MgmdRouterInterfaceEntry ::= SEQUENCE {

|   |                  |
|---|------------------|
| mgmdRouterInterfaceIfIndex              | InterfaceIndex,  |
| mgmdRouterInterfaceQuerierType          | InetAddressType, |
| mgmdRouterInterfaceQuerier              | InetAddress,     |
| mgmdRouterInterfaceQueryInterval        | Unsigned32,      |
| mgmdRouterInterfaceStatus               | RowStatus,       |
| mgmdRouterInterfaceVersion              | Unsigned32,      |
| mgmdRouterInterfaceQueryMaxResponseTime | Unsigned32,      |
| mgmdRouterInterfaceQuerierUpTime        | TimeTicks,       |
| mgmdRouterInterfaceQuerierExpiryTime    | TimeTicks,       |

```

mgmdRouterInterfaceWrongVersionQueries Counter32,
mgmdRouterInterfaceJoins Counter32,
mgmdRouterInterfaceProxyIfIndex InterfaceIndexOrZero,
mgmdRouterInterfaceGroups Gauge32,
mgmdRouterInterfaceRobustness Unsigned32,
mgmdRouterInterfaceLastMemberQueryInterval Unsigned32,
mgmdRouterInterfaceLastMemberQueryCount Unsigned32,
mgmdRouterInterfaceStartupQueryCount Unsigned32,
mgmdRouterInterfaceStartupQueryInterval Unsigned32
}

mgmdRouterInterfaceIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ifIndex value of the interface for which IGMP or MLD
        is enabled. The table is indexed by the ifIndex value and
        the InetAddressType to allow for interfaces that may be
        configured in both IPv4 and IPv6 modes."

    ::= { mgmdRouterInterfaceEntry 1 }

mgmdRouterInterfaceQuerierType OBJECT-TYPE
    SYNTAX      InetAddressType { ipv4(1), ipv6(2) }
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of this interface. This entry along with
        the ifIndex value acts as the index to the
        mgmdRouterInterface table. A physical interface may be
        configured in multiple modes concurrently, e.g., in IPv4
        and IPv6 modes connected to the same interface; however,
        the traffic is considered to be logically separate."

    ::= { mgmdRouterInterfaceEntry 2 }

mgmdRouterInterfaceQuerier OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The address of the IGMP or MLD Querier on the IP subnet to
        which this interface is attached. The InetAddressType,
        e.g., IPv4 or IPv6, is identified by the
        mgmdRouterInterfaceQuerierType variable in the
        mgmdRouterInterface table."

```

```
::= { mgmdRouterInterfaceEntry 3 }
```

mgmdRouterInterfaceQueryInterval OBJECT-TYPE

SYNTAX Unsigned32 (1..31744)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The frequency at which IGMP or MLD Host-Query packets are transmitted on this interface."

DEFVAL { 125 }

```
::= { mgmdRouterInterfaceEntry 4 }
```

mgmdRouterInterfaceStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The activation of a row enables the router side of IGMP or MLD on the interface. The destruction of a row disables the router side of IGMP or MLD on the interface."

```
::= { mgmdRouterInterfaceEntry 5 }
```

mgmdRouterInterfaceVersion OBJECT-TYPE

SYNTAX Unsigned32 (1..3)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The version of MGMD that is running on this interface. Value 1 applies to IGMPv1 routers only. Value 2 applies to IGMPv2 and MLDv1 routers, and value 3 applies to IGMPv3 and MLDv2 routers.

This object can be used to configure a router capable of running either version. For IGMP and MLD to function correctly, all routers on a LAN must be configured to run the same version on that LAN."

DEFVAL { 3 }

```
::= { mgmdRouterInterfaceEntry 6 }
```

mgmdRouterInterfaceQueryMaxResponseTime OBJECT-TYPE

SYNTAX Unsigned32 (0..31744)

UNITS "tenths of seconds"

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The maximum query response interval advertised in MGMDv2 or IGMPv3 queries on this interface."

REFERENCE "RFC 3810, Section 9.3"

DEFVAL { 100 }

::= { mgmdRouterInterfaceEntry 7 }

## mgmdRouterInterfaceQuerierUpTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The time since mgmdRouterInterfaceQuerier was last changed."

::= { mgmdRouterInterfaceEntry 8 }

## mgmdRouterInterfaceQuerierExpiryTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The amount of time remaining before the Other Querier Present Timer expires. If the local system is the querier, the value of this object is zero."

::= { mgmdRouterInterfaceEntry 9 }

## mgmdRouterInterfaceWrongVersionQueries OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of general queries received whose IGMP or MLD version does not match the equivalent mgmdRouterInterfaceVersion, over the lifetime of the row entry. Both IGMP and MLD require that all routers on a LAN be configured to run the same version. Thus, if any general queries are received with the wrong version, this indicates a configuration error."

::= { mgmdRouterInterfaceEntry 10 }

## mgmdRouterInterfaceJoins OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times a group membership has been added on this interface, that is, the number of times an entry for this interface has been added to the Cache Table. This object can give an indication of the amount of activity between samples over time."

::= { mgmdRouterInterfaceEntry 11 }

mgmdRouterInterfaceProxyIfIndex OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Some devices implement a form of IGMP or MLD proxying whereby memberships learned on the interface represented by this row cause Host Membership Reports to be sent on the interface whose ifIndex value is given by this object. Such a device would implement the mgmdV2RouterBaseMIBGroup only on its router interfaces (those interfaces with non-zero mgmdRouterInterfaceProxyIfIndex). Typically, the value of this object is 0, indicating that no proxying is being done."

DEFVAL { 0 }

::= { mgmdRouterInterfaceEntry 12 }

mgmdRouterInterfaceGroups OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current number of entries for this interface in the mgmdRouterCacheTable."

::= { mgmdRouterInterfaceEntry 13 }

mgmdRouterInterfaceRobustness OBJECT-TYPE

SYNTAX Unsigned32 (1..255)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Robustness Variable allows tuning for the expected packet loss on a subnet. If a subnet is expected to be lossy, the Robustness Variable may be increased. IGMP and MLD are robust to (Robustness Variable-1) packet losses."

DEFVAL { 2 }

```
::= { mgmdRouterInterfaceEntry 14 }
```

mgmdRouterInterfaceLastMemberQueryInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..31744)

UNITS "tenths of seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Last Member Query Interval is the Max Query Response Interval inserted into group-specific queries sent in response to leave group messages, and is also the amount of time between group-specific query messages. This value may be tuned to modify the leave latency of the network. A reduced value results in reduced time to detect the loss of the last member of a group. The value of this object is irrelevant if mgmdRouterInterfaceVersion is 1."

DEFVAL { 10 }

```
::= { mgmdRouterInterfaceEntry 15 }
```

mgmdRouterInterfaceLastMemberQueryCount OBJECT-TYPE

SYNTAX Unsigned32 (1..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Represents the number of group-specific and group-and-source-specific queries sent by the router before it assumes there are no local members."

```
::= { mgmdRouterInterfaceEntry 16 }
```

mgmdRouterInterfaceStartupQueryCount OBJECT-TYPE

SYNTAX Unsigned32 (1..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Represents the number of Queries sent out on startup, separated by the Startup Query Interval."

```
::= { mgmdRouterInterfaceEntry 17 }
```

mgmdRouterInterfaceStartupQueryInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..31744)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This variable represents the interval between General Queries sent by a Querier on startup."

::= { mgmdRouterInterfaceEntry 18 }

--

-- The MGMD Host Cache Table

--

## mgmdHostCacheTable OBJECT-TYPE

SYNTAX SEQUENCE OF MgmdHostCacheEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The (conceptual) table listing the IP multicast groups for which the host is a member on a particular interface."

::= { mgmdMIBObjects 3 }

## mgmdHostCacheEntry OBJECT-TYPE

SYNTAX MgmdHostCacheEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry (conceptual row) in the mgmdHostCacheTable."

INDEX { mgmdHostCacheAddressType, mgmdHostCacheAddress,  
mgmdHostCacheIfIndex }

::= { mgmdHostCacheTable 1 }

## MgmdHostCacheEntry ::= SEQUENCE {

mgmdHostCacheAddressType InetAddressType,

mgmdHostCacheAddress InetAddress ,

mgmdHostCacheIfIndex InterfaceIndex,

mgmdHostCacheUpTime TimeTicks,

mgmdHostCacheLastReporter InetAddress,

mgmdHostCacheSourceFilterMode INTEGER

}

## mgmdHostCacheAddressType OBJECT-TYPE

SYNTAX InetAddressType { ipv4(1), ipv6(2) }

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The address type of the mgmdHostCacheTable entry. This value applies to both the mgmdHostCacheAddress and the mgmdHostCacheLastReporter entries."

```
::= { mgmdHostCacheEntry 1 }
```

mgmdHostCacheAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE(4|16))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP multicast group address for which this entry contains information. The InetAddressType, e.g., IPv4 or IPv6, is identified by the mgmdHostCacheAddressType variable in the mgmdHostCache table."

```
::= { mgmdHostCacheEntry 2 }
```

mgmdHostCacheIfIndex OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The interface for which this entry contains information for an IP multicast group address."

```
::= { mgmdHostCacheEntry 3 }
```

mgmdHostCacheUpTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time elapsed since this entry was created."

```
::= { mgmdHostCacheEntry 4 }
```

mgmdHostCacheLastReporter OBJECT-TYPE

SYNTAX InetAddress (SIZE(4|16))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address of the source of the last membership report received for this IP multicast group address on this interface. If no membership report has been received, this object has a value of 0. The InetAddressType, e.g., IPv4 or IPv6, is identified by the mgmdHostCacheAddressType variable in the mgmdHostCache table."

```
::= { mgmdHostCacheEntry 5 }
```

mgmdHostCacheSourceFilterMode OBJECT-TYPE



```

SYNTAX      INTEGER {include (1),
                      exclude (2) }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The state in which the interface is currently set.  The
    value indicates the relevance of the corresponding source
    list entries in the mgmdHostSecListTable for MGMDv3
    interfaces."

 ::= { mgmdHostCacheEntry 6 }

--
-- The MGMD Router Cache Table
--

mgmdRouterCacheTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MgmdRouterCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the IP multicast groups for
        which there are members on a particular router interface."

    ::= { mgmdMIBObjects 4 }

mgmdRouterCacheEntry OBJECT-TYPE
    SYNTAX      MgmdRouterCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the mgmdRouterCacheTable."

    INDEX      { mgmdRouterCacheAddressType, mgmdRouterCacheAddress,
                  mgmdRouterCacheIfIndex }

    ::= { mgmdRouterCacheTable 1 }

MgmdRouterCacheEntry ::= SEQUENCE {
    mgmdRouterCacheAddressType      InetAddressType,
    mgmdRouterCacheAddress          InetAddress,
    mgmdRouterCacheIfIndex          InterfaceIndex,
    mgmdRouterCacheLastReporter     InetAddress,
    mgmdRouterCacheUpTime            TimeTicks,
    mgmdRouterCacheExpiryTime        TimeTicks,
    mgmdRouterCacheExcludeModeExpiryTimer
                                    TimeTicks,
    mgmdRouterCacheVersion1HostTimer TimeTicks,

```

```
mgmdRouterCacheVersion2HostTimer  TimeTicks,
mgmdRouterCacheSourceFilterMode    INTEGER
}

mgmdRouterCacheAddressType OBJECT-TYPE
    SYNTAX      InetAddressType { ipv4(1), ipv6(2) }
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of the mgmdRouterCacheTable entry.  This
        value applies to both the mgmdRouterCacheAddress and the
        mgmdRouterCacheLastReporter entries."

    ::= { mgmdRouterCacheEntry 1 }

mgmdRouterCacheAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The IP multicast group address for which this entry
        contains information.  The InetAddressType, e.g., IPv4 or
        IPv6, is identified by the mgmdRouterCacheAddressType
        variable in the mgmdRouterCache table."

    ::= { mgmdRouterCacheEntry 2 }

mgmdRouterCacheIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The interface for which this entry contains information
        for an IP multicast group address."

    ::= { mgmdRouterCacheEntry 3 }

mgmdRouterCacheLastReporter OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The IP address of the source of the last membership report
        received for this IP multicast group address on this
        interface.  If no membership report has been received, this
        object has the value 0.  The InetAddressType, e.g., IPv4 or
        IPv6, is identified by the mgmdRouterCacheAddressType
        variable in the mgmdRouterCache table."
```

```
::= { mgmdRouterCacheEntry 4 }
```

mgmdRouterCacheUpTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time elapsed since this entry was created."

```
::= { mgmdRouterCacheEntry 5 }
```

mgmdRouterCacheExpiryTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This value represents the time remaining before the Group Membership Interval state expires. The value must always be greater than or equal to 1."

```
::= { mgmdRouterCacheEntry 6 }
```

mgmdRouterCacheExcludeModeExpiryTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This value is applicable only to MGMDv3-compatible nodes and represents the time remaining before the interface EXCLUDE state expires and the interface state transitions to INCLUDE mode. This value can never be greater than mgmdRouterCacheExpiryTime."

```
::= { mgmdRouterCacheEntry 7 }
```

mgmdRouterCacheVersion1HostTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining until the local router will assume that there are no longer any MGMD version 1 members on the IP subnet attached to this interface. This entry only applies to IGMPv1 hosts, and is not implemented for MLD. Upon hearing any MGMDv1 Membership Report (IGMPv1 only), this value is reset to the group membership timer. While this

time remaining is non-zero, the local router ignores any MGMDv2 Leave messages (IGMPv2 only) for this group that it receives on this interface."

::= { mgmdRouterCacheEntry 8 }

mgmdRouterCacheVersion2HostTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining until the local router will assume that there are no longer any MGMD version 2 members on the IP subnet attached to this interface. This entry applies to both IGMP and MLD hosts. Upon hearing any MGMDv2 Membership Report, this value is reset to the group membership timer. Assuming no MGMDv1 hosts have been detected, the local router does not ignore any MGMDv2 Leave messages for this group that it receives on this interface."

::= { mgmdRouterCacheEntry 9 }

mgmdRouterCacheSourceFilterMode OBJECT-TYPE

SYNTAX INTEGER {include (1),  
exclude (2) }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current cache state, applicable to MGMDv3-compatible nodes. The value indicates whether the state is INCLUDE or EXCLUDE."

::= { mgmdRouterCacheEntry 10 }

--

-- The MGMD Inverse Host interface/cache lookup Table

--

mgmdInverseHostCacheTable OBJECT-TYPE

SYNTAX SEQUENCE OF MgmdInverseHostCacheEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The (conceptual) table listing the interfaces that are members of a particular group. This is an inverse lookup table for entries in the mgmdHostCacheTable."

::= { mgmdMIBObjects 5 }

```
mgmdInverseHostCacheEntry OBJECT-TYPE
    SYNTAX      MgmmdInverseHostCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the
        mgmdInverseHostCacheTable."
    INDEX       { mgmdInverseHostCacheIfIndex,
                  mgmdInverseHostCacheAddressType,
                  mgmdInverseHostCacheAddress }

    ::= { mgmdInverseHostCacheTable 1 }

MgmmdInverseHostCacheEntry ::= SEQUENCE {
    mgmdInverseHostCacheIfIndex      InterfaceIndex,
    mgmdInverseHostCacheAddressType  InetAddressType,
    mgmdInverseHostCacheAddress      InetAddress
}

mgmdInverseHostCacheIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The interface for which this entry contains information."

    ::= { mgmdInverseHostCacheEntry 1 }

mgmdInverseHostCacheAddressType OBJECT-TYPE
    SYNTAX      InetAddressType { ipv4(1), ipv6(2) }
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of the mgmdInverseHostCacheTable entry."

    ::= { mgmdInverseHostCacheEntry 2 }

mgmdInverseHostCacheAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The IP multicast group address for which this entry
        contains information about an interface. The
        InetAddressType, e.g., IPv4 or IPv6, is identified by the
        mgmdInverseHostCacheAddressType variable in the
        mgmdInverseHostCache table."
```

```

 ::= { mgmdInverseHostCacheEntry 3 }

--
-- The MGMD Inverse Router interface/cache lookup Table
--

mgmdInverseRouterCacheTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MgmdInverseRouterCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the interfaces that
        are members of a particular group. This is an inverse
        lookup table for entries in the mgmdRouterCacheTable."

    ::= { mgmdMIBObjects 6 }

mgmdInverseRouterCacheEntry OBJECT-TYPE
    SYNTAX      MgmdInverseRouterCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the
        mgmdInverseRouterCacheTable."
    INDEX       { mgmdInverseRouterCacheIfIndex,
                  mgmdInverseRouterCacheAddressType,
                  mgmdInverseRouterCacheAddress }

    ::= { mgmdInverseRouterCacheTable 1 }

MgmdInverseRouterCacheEntry ::= SEQUENCE {
    mgmdInverseRouterCacheIfIndex      InterfaceIndex,
    mgmdInverseRouterCacheAddressType  InetAddressType,
    mgmdInverseRouterCacheAddress      InetAddress
}

mgmdInverseRouterCacheIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The interface for which this entry contains information
        for an IP multicast group address."

    ::= { mgmdInverseRouterCacheEntry 1 }

mgmdInverseRouterCacheAddressType OBJECT-TYPE
    SYNTAX      InetAddressType { ipv4(1), ipv6(2) }

```

```

MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "The address type of the mgmdInverseRouterCacheTable entry."

```

```
 ::= { mgmdInverseRouterCacheEntry 2 }
```

```
mgmdInverseRouterCacheAddress OBJECT-TYPE
```

```

SYNTAX      InetAddress (SIZE(4|16))
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
    "The IP multicast group address for which this entry
    contains information.  The InetAddressType, e.g., IPv4 or
    IPv6, is identified by the mgmdInverseRouterCacheAddressType
    variable in the mgmdInverseRouterCache table."

```

```
 ::= { mgmdInverseRouterCacheEntry 3 }
```

```
--
```

```
-- The MGMD Host Source list Table
```

```
--
```

```
mgmdHostSrcListTable OBJECT-TYPE
```

```

SYNTAX      SEQUENCE OF MgmdHostSrcListEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "The (conceptual) table listing the Source List entries
    corresponding to each interface and multicast group pair
    on a host."

```

```
 ::= { mgmdMIBObjects 7 }
```

```
mgmdHostSrcListEntry OBJECT-TYPE
```

```

SYNTAX      MgmdHostSrcListEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "An entry (conceptual row) in the mgmdHostSrcListTable."
INDEX       { mgmdHostSrcListAddressType, mgmdHostSrcListAddress,
              mgmdHostSrcListIfIndex, mgmdHostSrcListHostAddress }

```

```
 ::= { mgmdHostSrcListTable 1 }
```

```
MgmdHostSrcListEntry ::= SEQUENCE {
```

```

    mgmdHostSrcListAddressType  InetAddressType,
    mgmdHostSrcListAddress      InetAddress,

```

```
mgmdHostSrcListIfIndex      InterfaceIndex,
mgmdHostSrcListHostAddress  InetAddress,
mgmdHostSrcListExpire       TimeTicks
}

mgmdHostSrcListAddressType OBJECT-TYPE
    SYNTAX      InetAddressType { ipv4(1), ipv6(2) }
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of the InetAddress variables in this
        table.  This value applies to the mgmdHostSrcListHostAddress
        and mgmdHostSrcListAddress entries."

    ::= { mgmdHostSrcListEntry 1 }

mgmdHostSrcListAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The IP multicast group address for which this entry
        contains information."

    ::= { mgmdHostSrcListEntry 2 }

mgmdHostSrcListIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The interface for which this entry contains information
        for an IP multicast group address."

    ::= { mgmdHostSrcListEntry 3 }

mgmdHostSrcListHostAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The host address to which this entry corresponds.  The
        mgmdHostCacheSourceFilterMode value for this group address
        and interface indicates whether this host address is
        included or excluded."

    ::= { mgmdHostSrcListEntry 4 }
```



## mgmdHostSrcListExpire OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This value indicates the relevance of the SrcList entry, whereby a non-zero value indicates this is an INCLUDE state value, and a zero value indicates this to be an EXCLUDE state value."

```
::= { mgmdHostSrcListEntry 5 }
```

--

-- The MGMD Router Source list Table

--

## mgmdRouterSrcListTable OBJECT-TYPE

SYNTAX SEQUENCE OF MgmdRouterSrcListEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The (conceptual) table listing the Source List entries corresponding to each interface and multicast group pair on a Router."

```
::= { mgmdMIBObjects 8 }
```

## mgmdRouterSrcListEntry OBJECT-TYPE

SYNTAX MgmdRouterSrcListEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry (conceptual row) in the mgmdRouterSrcListTable."

```
INDEX { mgmdRouterSrcListAddressType,
        mgmdRouterSrcListAddress,
        mgmdRouterSrcListIfIndex,
        mgmdRouterSrcListHostAddress }
```

```
::= { mgmdRouterSrcListTable 1 }
```

## MgmdRouterSrcListEntry ::= SEQUENCE {

mgmdRouterSrcListAddressType InetAddressType,

mgmdRouterSrcListAddress InetAddress,

mgmdRouterSrcListIfIndex InterfaceIndex,

mgmdRouterSrcListHostAddress InetAddress,

mgmdRouterSrcListExpire TimeTicks

}

## mgmdRouterSrcListAddressType OBJECT-TYPE

SYNTAX InetAddressType { ipv4(1), ipv6(2) }

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The address type of the InetAddress variables in this table. This value applies to the mgmdRouterSrcListHostAddress and mgmdRouterSrcListAddress entries."

::= { mgmdRouterSrcListEntry 1 }

## mgmdRouterSrcListAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE(4|16))

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The IP multicast group address for which this entry contains information."

::= { mgmdRouterSrcListEntry 2 }

## mgmdRouterSrcListIfIndex OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The interface for which this entry contains information for an IP multicast group address."

::= { mgmdRouterSrcListEntry 3 }

## mgmdRouterSrcListHostAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE(4|16))

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The host address to which this entry corresponds. The mgmdRouterCacheSourceFilterMode value for this group address and interface indicates whether this host address is included or excluded."

::= { mgmdRouterSrcListEntry 4 }

## mgmdRouterSrcListExpire OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This value indicates the relevance of the SrcList entry, whereby a non-zero value indicates this is an INCLUDE state value, and a zero value indicates this to be an EXCLUDE state value."

::= { mgmdRouterSrcListEntry 5 }

-- conformance information

mgmdMIBConformance OBJECT IDENTIFIER ::= { mgmdStdMIB 2 }  
mgmdMIBCompliance OBJECT IDENTIFIER ::= { mgmdMIBConformance 1 }  
mgmdMIBGroups OBJECT IDENTIFIER ::= { mgmdMIBConformance 2 }

-- Protocol Version Conformance

-- Read Compliance statement for IGMPv1 Hosts  
-- IGMPv1 only supports the IPv4 Address Family

mgmdIgmpV1HostReadMIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"A read-only compliance statement for hosts running IGMPv1 [RFC1112] and implementing the MGMD MIB. IGMPv1 hosts must support the IPv4 address type."

MODULE -- this module

MANDATORY-GROUPS { mgmdHostBaseMIBGroup }

OBJECT mgmdHostInterfaceStatus

SYNTAX RowStatus {active(1)}

MIN-ACCESS read-only

DESCRIPTION

"Read-write or read-create access is not required and only the value 'active(1)' needs to be supported."

OBJECT mgmdHostInterfaceVersion

SYNTAX Unsigned32 (1)

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required. Only version 1 needs to be supported."

GROUP mgmdHostExtendedMIBGroup

DESCRIPTION

"Supporting this group can be especially useful in an environment with a router that does not support the MGMD MIB."

```

 ::= { mgmdMIBCompliance 1 }

-- Read Compliance statement for IGMPv1 Routers
-- IGMPv1 only supports the IPv4 Address Family

mgmdIgmpV1RouterReadMIBCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "A read-only compliance statement for routers running
        IGMPv1 [RFC1112] and implementing the MGMD MIB.  IGMPv1
        routers only support the IPv4 address type.

        Non-accessible index objects that only need IPv4
        support are:

        OBJECT mgmdRouterCacheAddressType
        SYNTAX InetAddressType { ipv4(1) }

        OBJECT mgmdRouterCacheAddress
        SYNTAX InetAddress (SIZE(4))

        OBJECT mgmdRouterInterfaceQuerierType
        SYNTAX InetAddressType { ipv4(1) }

        OBJECT mgmdInverseRouterCacheAddressType
        SYNTAX InetAddressType { ipv4(1) }
        "

MODULE -- this module
MANDATORY-GROUPS { mgmdRouterBaseMIBGroup }

OBJECT mgmdRouterCacheLastReporter
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
    "IGMPv1 routers only support IPv4 addresses."

OBJECT mgmdRouterInterfaceQuerier
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
    "IGMPv1 routers only support IPv4 addresses."

OBJECT mgmdInverseRouterCacheAddress
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
    "IGMPv1 routers only support IPv4 addresses."

OBJECT mgmdRouterInterfaceVersion
SYNTAX Unsigned32 (1)

```

```
MIN-ACCESS read-only
DESCRIPTION
    "Write access is not required.  Only version 1 needs to
    be supported."

OBJECT mgmdRouterInterfaceStatus
SYNTAX RowStatus {active(1)}
MIN-ACCESS read-only
DESCRIPTION
    "Read-write or read-create access is not required and only
    the value 'active(1)' needs to be supported."

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

 ::= { mgmdMIBCompliance 2 }

-- Write Compliance statement for IGMPv1 Routers
-- IGMPv1 only supports the IPv4 Address Family

mgmdIgmpV1RouterWriteMIBCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
    "A read-create compliance statement for routers running
    IGMPv1 [RFC1112] and implementing the MGMD MIB.  IGMPv1
    routers only support the IPv4 address type.

    Non-accessible index objects that only need IPv4
    support are:

    OBJECT mgmdRouterCacheAddressType
    SYNTAX InetAddressType { ipv4(1) }

    OBJECT mgmdRouterCacheAddress
    SYNTAX InetAddress (SIZE(4))

    OBJECT mgmdRouterInterfaceQuerierType
    SYNTAX InetAddressType { ipv4(1) }

    OBJECT mgmdInverseRouterCacheAddressType
    SYNTAX InetAddressType { ipv4(1) }
    "
MODULE -- this module
MANDATORY-GROUPS { mgmdRouterBaseMIBGroup }
```

```
OBJECT mgmdRouterCacheLastReporter
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
    "Only IPv4 addresses needed for IGMPv1 router support."
```

```
OBJECT mgmdRouterInterfaceQuerier
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
    "Only IPv4 addresses needed for IGMPv1 router support."
```

```
OBJECT mgmdInverseRouterCacheAddress
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
    "Only IPv4 addresses needed for IGMPv1 router support."
```

```
OBJECT mgmdRouterInterfaceVersion
SYNTAX Unsigned32 (1)
DESCRIPTION
    "Write access is not required. Only version 1 needs to
    be supported."
```

```
::= { mgmdMIBCompliance 3 }
```

```
-- Read Compliance statement for IGMPv2 and MLDv1 Hosts
-- IGMPv2 only supports the IPv4 Address Family
-- MLDv1 only supports the IPv6 Address Family
```

```
mgmdIgmpV2MldV1HostReadMIBCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
    "A read-only compliance statement for hosts running IGMPv2
    [RFC2236] or MLDv1 [RFC2710] and implementing the MGMD
    MIB. IGMPv2 hosts only support the IPv4 address type and
    MLDv1 hosts only support the IPv6 address type."
MODULE -- this module
MANDATORY-GROUPS { mgmdHostBaseMIBGroup,
                    mgmdV2HostMIBGroup
                  }

OBJECT mgmdHostInterfaceStatus
SYNTAX RowStatus {active(1)}
MIN-ACCESS read-only
DESCRIPTION
    "Read-write or read-create access is not required and only
    the value 'active(1)' needs to be supported."

OBJECT mgmdHostInterfaceVersion
SYNTAX Unsigned32 (1..2)
```

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required. Only versions 1 and 2 need to be supported."

GROUP mgmdHostExtendedMIBGroup

DESCRIPTION

"Supporting this group can be especially useful in an environment with a router that does not support the MGMD MIB."

::= { mgmdMIBCompliance 4 }

-- Write Compliance statement for IGMPv2 and MLDv1 Hosts  
 -- IGMPv2 only supports the IPv4 Address Family  
 -- MLDv1 only supports the IPv6 Address Family

mgmdIgmpV2MldV1HostWriteMIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"A read-create compliance statement for hosts running IGMPv2 [RFC2236] or MLDv1 [RFC2710] and implementing the MGMD MIB. IGMPv2 hosts only support the IPv4 address type and MLDv1 hosts only support the IPv6 address type."

MODULE -- this module

MANDATORY-GROUPS { mgmdHostBaseMIBGroup,  
 mgmdV2HostMIBGroup }

OBJECT mgmdHostInterfaceVersion

SYNTAX Unsigned32 (1..2)

DESCRIPTION

"Only versions 1 and 2 need to be supported."

::= { mgmdMIBCompliance 5 }

-- Read Compliance statement for IGMPv2 and MLDv1 Routers  
 -- IGMPv2 only supports the IPv4 Address Family  
 -- MLDv1 only supports the IPv6 Address Family

mgmdIgmpV2MldV1RouterReadMIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"A read-only compliance statement for routers running IGMPv2 [RFC2236] or MLDv1 [RFC2710] and implementing the MGMD MIB. IGMPv2 routers only support the IPv4 address type and MLDv1 routers only support the IPv6 address type."

MODULE -- this module

MANDATORY-GROUPS { mgmdRouterBaseMIBGroup,

```
        mgmdV2RouterBaseMIBGroup
    }
```

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

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

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

```
OBJECT mgmdRouterInterfaceVersion
SYNTAX Unsigned32 (1..2)
MIN-ACCESS read-only
DESCRIPTION
    "Write access is not required.  Only versions 1 and 2
    need to be supported."
```

```
OBJECT mgmdRouterInterfaceStatus
SYNTAX RowStatus {active(1)}
MIN-ACCESS read-only
DESCRIPTION
    "Read-write or read-create access is not required and only
    the value 'active(1)' needs to be supported."
```

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

```
GROUP    mgmdV2ProxyMIBGroup
DESCRIPTION
    "Write access is not required."
```

```
::= { mgmdMIBCompliance 6 }
```

```
-- Write Compliance statement for IGMPv2, IGMPv3, MLDv1, and MLDv2
-- Routers
-- IGMPv2 and IGMPv3 only support the IPv4 Address Family
-- MLDv1 and MLDv2 only support the IPv6 Address Family
```



```
mgmdIgmpV2V3MldV1V2RouterWriteMIBCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "A read-create compliance statement for routers running
    IGMPv2 [RFC2236], IGMPv3 [RFC3376], MLDv1 [RFC2710], or
    MLDv2 [RFC3810] and implementing the MGMD MIB. IGMPv2 and
    IGMPv3 routers only support the IPv4 address type, while
    MLDv1 and MLDv2 routers only support the IPv6 address type."
  MODULE -- this module
  MANDATORY-GROUPS { mgmdRouterBaseMIBGroup,
                      mgmdV2RouterBaseMIBGroup
                    }

  GROUP mgmdV2ProxyMIBGroup
  DESCRIPTION
    "Read-create access is required."

  ::= { mgmdMIBCompliance 7 }

-- Read Compliance statement for IGMPv2, IGMPv3, MLDv1, and MLDv2 Hosts
-- IGMPv2 and IGMPv3 only support the IPv4 Address Family
-- MLDv1 and MLDv2 only support the IPv6 Address Family

mgmdIgmpV3MldV2HostReadMIBCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for hosts running IGMPv3
    [RFC3376] or MLDv2 [RFC3810] and implementing the
    MGMD MIB. IGMPv3 hosts only support the IPv4 address
    type and MLDv2 hosts only support the IPv6 address type."
  MODULE -- this module
  MANDATORY-GROUPS { mgmdHostBaseMIBGroup,
                      mgmdV2HostMIBGroup,
                      mgmdV3HostMIBGroup
                    }

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

  OBJECT mgmdHostInterfaceStatus
  SYNTAX RowStatus {active(1)}
  MIN-ACCESS read-only
  DESCRIPTION
    "Read-write or read-create access is not required and only
    the value 'active(1)' needs to be supported."
```

OBJECT mgmdHostInterfaceVersion3Robustness

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

GROUP mgmdHostExtendedMIBGroup

DESCRIPTION

"Supporting this group can be especially useful in an environment with a router that does not support the MGMD MIB."

::= { mgmdMIBCompliance 8 }

-- Write Compliance statement for IGMPv2, IGMPv3, MLDv1, and MLDv2 Hosts

-- IGMPv2 and IGMPv3 only support the IPv4 Address Family

-- MLDv1 and MLDv2 only support the IPv6 Address Family

mgmdIgmpV3MldV2HostWriteMIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for hosts running IGMPv3 [RFC3376] or MLDv2 [RFC3810] and implementing the MGMD MIB. IGMPv3 hosts only support the IPv4 address type and MLDv2 hosts only support the IPv6 address type."

MODULE -- this module

MANDATORY-GROUPS { mgmdHostBaseMIBGroup,  
mgmdV2HostMIBGroup,  
  
mgmdV3HostMIBGroup  
}

GROUP mgmdHostExtendedMIBGroup

DESCRIPTION

"Supporting this group can be especially useful in an environment with a router that does not support the MGMD MIB."

::= { mgmdMIBCompliance 9 }

-- Read Compliance statement for IGMPv2, IGMPv3, MLDv1, and MLDv2

-- Routers

-- IGMPv2 and IGMPv3 only support the IPv4 Address Family

-- MLDv1 and MLDv2 only support the IPv6 Address Family

mgmdIgmpV3MldV2RouterReadMIBCompliance MODULE-COMPLIANCE

STATUS current

## DESCRIPTION

"A read-only compliance statement for routers running IGMPv3 [RFC3376] or MLDv2 [RFC3810] and implementing the MGMD MIB. IGMPv3 routers only support the IPv4 address type and MLDv2 routers only support the IPv6 address type."

MODULE -- this module

```
MANDATORY-GROUPS { mgmdRouterBaseMIBGroup,
                    mgmdV2RouterBaseMIBGroup,
                    mgmdV3RouterMIBGroup
                  }
```

OBJECT mgmdRouterInterfaceLastMemberQueryInterval

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT mgmdRouterInterfaceRobustness

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT mgmdRouterInterfaceQueryMaxResponseTime

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT mgmdRouterInterfaceVersion

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT mgmdRouterInterfaceStatus

SYNTAX RowStatus {active(1)}

MIN-ACCESS read-only

DESCRIPTION

"Read-write or read-create access is not required and only the value 'active(1)' needs to be supported."

OBJECT mgmdRouterInterfaceQueryInterval

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

GROUP mgmdV2ProxyMIBGroup

DESCRIPTION

"Write access is not required."

```
 ::= { mgmdMIBCompliance 10 }

-- units of conformance

mgmdHostBaseMIBGroup OBJECT-GROUP
  OBJECTS { mgmdHostInterfaceStatus,
             mgmdHostInterfaceVersion
           }
  STATUS   current
  DESCRIPTION
    "The basic collection of objects providing management of
    MGMD version 1, 2, or 3 for hosts."

 ::= { mgmdMIBGroups 1 }

mgmdRouterBaseMIBGroup OBJECT-GROUP
  OBJECTS { mgmdRouterInterfaceStatus,
             mgmdRouterInterfaceQueryInterval,
             mgmdRouterCacheUpTime, mgmdRouterCacheExpiryTime,
             mgmdRouterInterfaceVersion,
             mgmdRouterInterfaceJoins, mgmdRouterInterfaceGroups,
             mgmdRouterCacheLastReporter,
             mgmdRouterInterfaceQuerierUpTime,
             mgmdRouterInterfaceQuerierExpiryTime,
             mgmdRouterInterfaceQuerier,
             mgmdInverseRouterCacheAddress
           }
  STATUS   current
  DESCRIPTION
    "The basic collection of objects providing management of
    MGMD version 1, 2, or 3 for routers."

 ::= { mgmdMIBGroups 2 }

mgmdV2HostMIBGroup OBJECT-GROUP
  OBJECTS { mgmdHostInterfaceVersion1QuerierTimer
           }
  STATUS   current
  DESCRIPTION
    "A collection of additional read-only objects for management
    of IGMP version 2 in hosts for MGMD version 2 compliance."

 ::= { mgmdMIBGroups 3 }

mgmdHostExtendedMIBGroup OBJECT-GROUP
  OBJECTS { mgmdHostCacheLastReporter, mgmdHostCacheUpTime,
             mgmdHostInterfaceQuerier, mgmdInverseHostCacheAddress }
  STATUS   current
```

## DESCRIPTION

"A collection of optional objects for MGMD hosts."

::= { mgmdMIBGroups 4 }

## mgmdV2RouterBaseMIBGroup OBJECT-GROUP

OBJECTS { mgmdRouterInterfaceWrongVersionQueries,  
mgmdRouterInterfaceLastMemberQueryCount,  
mgmdRouterInterfaceStartupQueryCount,  
mgmdRouterInterfaceStartupQueryInterval,  
mgmdRouterCacheVersion1HostTimer,  
mgmdRouterInterfaceQueryMaxResponseTime,  
mgmdRouterInterfaceRobustness,  
mgmdRouterInterfaceLastMemberQueryInterval  
}

STATUS current

## DESCRIPTION

"A collection of additional read-only objects for management of MGMD version 2 in routers."

::= { mgmdMIBGroups 5 }

## mgmdV2ProxyMIBGroup OBJECT-GROUP

OBJECTS { mgmdRouterInterfaceProxyIfIndex }

STATUS current

## DESCRIPTION

"A collection of additional read-create objects for management of MGMD proxy devices."

::= { mgmdMIBGroups 6 }

## mgmdV3HostMIBGroup OBJECT-GROUP

OBJECTS { mgmdHostInterfaceVersion2QuerierTimer,  
mgmdHostCacheSourceFilterMode,  
mgmdHostInterfaceVersion3Robustness,  
mgmdHostSrcListExpire  
}

STATUS current

## DESCRIPTION

"A collection of additional objects for management of MGMD version 3 in hosts."

::= { mgmdMIBGroups 7 }

## mgmdV3RouterMIBGroup OBJECT-GROUP

OBJECTS { mgmdRouterCacheSourceFilterMode,  
mgmdRouterCacheVersion2HostTimer,  
mgmdRouterCacheExcludeModeExpiryTimer,  
}

```
        mgmdRouterSrcListExpire
    }
    STATUS current
    DESCRIPTION
        "A collection of additional read-only objects for
        management of MGMD version 3 in routers."

    ::= { mgmdMIBGroups 8 }
```

END

## 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:

- o The mgmdRouterInterfaceTable provides read-create access to 2 values: the mgmdRouterInterfaceStatus and the mgmdRouterInterfaceQueryInterval. The mgmdRouterInterfaceStatus presents a remote user with the ability to enable or disable multicast support on a given router interface, and therefore presents a significant denial-of-service vulnerability. The mgmdRouterInterfaceQueryInterval controls the frequency with which host-query packets are sent, providing less of a vulnerability, but still requiring secure access control.
- o The mgmdRouterCacheTable also provides access to read-create objects. The mgmdRouterInterfaceVersion controls the protocol conformance of an interface, and is therefore a potential denial-of-service vulnerability. The mgmdRouterInterfaceQueryMaxResponseTime, the mgmdRouterInterfaceRobustness, and the mgmdRouterInterfaceLastMemberQueryInterval are all tuning parameters to control the characteristic of the host-query packets. Compromise of these objects can potentially be disruptive to local multicast communication.
- o The mgmdHostInterfaceTable provides a read-create object, the mgmdHostInterfaceVersion3Robustness, which controls the robustness of the interface to packet loss. Disabling robustness in the face of packet loss could cause denial of service to hosts; however, in general this presents a low risk.

SNMP versions prior to SNMPv3 did not include adequate security. 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 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 to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

## 7. IANA Considerations

This MIB introduces a new term to refer to two existing multicast protocols: Multicast Group Membership Discovery. It encompasses both the IPv4 Multicast discovery protocol, IGMP, and the IPv6 Multicast discovery protocol, MLD, as defined in RFCs 2933 [RFC2933] and 3019 [RFC3019], respectively.

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER value recorded in the SMI Numbers registry:

| Descriptor | OBJECT IDENTIFIER value |
|------------|-------------------------|
| -----      | -----                   |
| mgmdStdMIB | { mib-2 185 }           |

## 8. Contributors

The authors of RFC 2933 [RFC2933] and RFC 3019 [RFC3019] from which this document is derived are:

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