IDMR Working Group
INTERNET-DRAFT
Expires August 1995

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4 February 1995

Internet Group Management Protocol MIB

<draft-ietf-idmr-igmp-mib-01.txt>

Status of this Memo

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1. Introduction

This memo defines an experimental 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 the Internet Group Management Protocol (IGMP). All of this MIB module is applicable to IP multicast routers [6,7]; a subset is applicable to hosts implementing IGMP [5].

2. The SNMPv2 Network Management Framework

The SNMPv2 Network Management Framework consists of four major components. They are:

- o RFC 1442 [1] which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management.
- o STD 17, RFC 1213 [2] defines MIB-II, the core set of managed objects for the Internet suite of protocols.
- o RFC 1445 [3] which defines the administrative and other architectural aspects of the framework.
- o RFC 1448 [4] which defines the protocol used for network access to managed objects.

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

3. Overview

This MIB module contains two tables:

(1) the IGMP Interface Table which contains one row for each interface on which IGMP is enabled, and

(2) the IGMP Cache Table which contains one row for each IP multicast group for which there are members on a particular interface.

Both tables are intended to be implemented by hosts and routers, but some columnar objects in each table apply only to routers.

4. Definitions

```
IGMP-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, experimental,
    Integer32, IpAddress, TimeTicks  FROM SNMPv2-SMI
    RowStatus, TruthValue            FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP  FROM SNMPv2-CONF;


igmpMIB MODULE-IDENTITY
    LAST-UPDATED "9502042359Z"
    ORGANIZATION "IETF IDMR Working Group."
    CONTACT-INFO
            " Keith McCloghrie
              cisco Systems, Inc.
              1525 O'Brien Dr.
              Menlo Park, CA 94025
              EMail: kzm@cisco.com"
    DESCRIPTION
            "The MIB module for IGMP Management."
    ::= { experimental xx }   -- to be assigned by IANA


igmpMIBObjects     OBJECT IDENTIFIER ::= { igmpMIB 1 }

igmp      OBJECT IDENTIFIER ::= { igmpMIBObjects 1 }
```

```
--
--  The IGMP Interface Table
--

igmpInterfaceTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF IgmpInterfaceEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "The (conceptual) table listing the interfaces on which IGMP
            is enabled."
    ::= { igmp 1 }

igmpInterfaceEntry OBJECT-TYPE
    SYNTAX     IgmpInterfaceEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "An entry (conceptual row) representing an interface on
            which IGMP is enabled."
    INDEX      { igmpInterfaceIfIndex }
    ::= { igmpInterfaceTable 1 }

IgmpInterfaceEntry ::= SEQUENCE {
    igmpInterfaceIfIndex        Integer32,
    igmpInterfaceQueryInterval  Integer32,
    igmpInterfaceStatus         RowStatus
}

igmpInterfaceIfIndex OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "The interface for which IGMP is enabled."
    ::= { igmpInterfaceEntry 1 }

igmpInterfaceQueryInterval OBJECT-TYPE
    SYNTAX     Integer32
    UNITS      "seconds"
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The frequency at which IGMP Host-Query packets are
            transmitted on this interface."
```

```
    DEFVAL     { 60 }
    ::= { igmpInterfaceEntry 2 }

igmpInterfaceStatus OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The activation of a row enables IGMP on the interface.  The
            destruction of a row disables IGMP on the interface."
    ::= { igmpInterfaceEntry 3 }


--
--  The IGMP Cache Table
--

igmpCacheTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF IgmpCacheEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "The (conceptual) table listing the IP multicast groups for
            which there are members on a particular interface."
    ::= { igmp 2 }

igmpCacheEntry OBJECT-TYPE
    SYNTAX     IgmpCacheEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "An entry (conceptual row) in the igmpCacheTable."
    INDEX      { igmpCacheAddress, igmpCacheIfIndex }
    ::= { igmpCacheTable 1 }
```

```
IgmpCacheEntry ::= SEQUENCE {
    igmpCacheAddress        IpAddress,
    igmpCacheIfIndex        Integer32,
    igmpCacheSelf           TruthValue,
    igmpCacheLastReporter   IpAddress,
    igmpCacheUpTime         TimeTicks,
    igmpCacheExpiryTime     TimeTicks,
    igmpCacheStatus         RowStatus
}

igmpCacheAddress OBJECT-TYPE
    SYNTAX     IpAddress
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "The IP multicast group address for which this entry
            contains information."
    ::= { igmpCacheEntry 1 }

igmpCacheIfIndex OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "The interface for which this entry contains information for
            an IP multicast group address."
    ::= { igmpCacheEntry 2 }

igmpCacheSelf OBJECT-TYPE
    SYNTAX     TruthValue
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "An indication of whether the local system is a member of
            this group address on this interface."
    DEFVAL     { true }
    ::= { igmpCacheEntry 3 }

igmpCacheLastReporter OBJECT-TYPE
    SYNTAX     IpAddress
    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 0.0.0.0."
    ::= { igmpCacheEntry 4 }

igmpCacheUpTime OBJECT-TYPE
    SYNTAX     TimeTicks
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The time since the system joined this group address, or
            zero if the system is not currently a member."
    ::= { igmpCacheEntry 5 }

igmpCacheExpiryTime OBJECT-TYPE
    SYNTAX     TimeTicks
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The minimum amount of time remaining before this entry will
            be aged out."
    ::= { igmpCacheEntry 6 }

igmpCacheStatus OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The status of this entry."
    ::= { igmpCacheEntry 7 }
```

```
-- conformance information

igmpMIBConformance
               OBJECT IDENTIFIER ::= { igmpMIB 2 }
igmpMIBCompliances
               OBJECT IDENTIFIER ::= { igmpMIBConformance 1 }
igmpMIBGroups  OBJECT IDENTIFIER ::= { igmpMIBConformance 2 }


-- compliance statements

igmpHostMIBCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for hosts implementing the IGMP
            MIB."
    MODULE  -- this module
        MANDATORY-GROUPS { igmpBaseMIBGroup }

    ::= { igmpMIBCompliances 1 }


igmpRouterMIBCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for routers implementing the IGMP
            MIB."
    MODULE  -- this module
        MANDATORY-GROUPS { igmpBaseMIBGroup,
                           igmpRouterMIBGroup
                         }
    ::= { igmpMIBCompliances 2 }


-- units of conformance

igmpBaseMIBGroup OBJECT-GROUP
    OBJECTS { igmpCacheSelf, igmpCacheLastReporter,
              igmpCacheStatus, igmpInterfaceStatus
            }
    STATUS  current
    DESCRIPTION
            "The basic collection of objects providing management of
            IGMP."
    ::= { igmpMIBGroups 1 }
```

```
igmpRouterMIBGroup OBJECT-GROUP
    OBJECTS { igmpCacheUpTime, igmpCacheExpiryTime,
              igmpInterfaceQueryInterval
            }
    STATUS  current
    DESCRIPTION
            "A collection of additional objects for management of IGMP
            in routers."
    ::= { igmpMIBGroups 2 }

END
```

5. References

[1] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1442, SNMP Research,Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.

[2] McCloghrie, K., and M. Rose, Editors, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, RFC 1213, Hughes LAN Systems, Performance Systems International, March 1991.

[3] Galvin, J., and K. McCloghrie, "Administrative Model for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1445, Trusted Information Systems, Hughes LAN Systems, April 1993.

[4] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1448, SNMP Research,Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.

[5] Deering, S., "Host Extensions for IP Multicasting", RFC 1112, August 1989.

[6] Waitzman, D., Partridge, C., and S.E. Deering, "Distance Vector Multicast Routing Protocol", RFC 1075, November 1988.

[7] Deering, S., Estrin, D., Farinacci, D., Jacobson, V., Liu, G., and L. Wei, "Protocol Independent Multicast (PIM): Protocol Specification", January 1995.

6. Security Considerations

Security issues are not discussed in this memo.

7. Author's Address

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