Management Information Base for IP Version 6: ICMPv6 Group

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.

Copyright Notice

Copyright (C) The Internet Society (1998). All Rights Reserved.

Abstract

This document is one in the series of documents that define various MIB object groups for IPv6. Specifically, the ICMPv6 group is defined in this document.

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the IPv6-based internets.

This document specifies a MIB module in a manner that is both compliant to the SNMPv2 SMI, and semantically identical to the peer SNMPv1 definitions.

Table of Contents

1. The SNMPv2 Network Management Framework ..............  2
1.1 Object Definitions ......................................  2
2. Overview ....................................................  2
3. The ICMPv6 Group ...........................................  3
4. Acknowledgments .............................................  14
5. References ...................................................  14
6. Security Considerations ....................................  15
7. Authors’ Addresses...........................................  15
8. Full Copyright Statement....................................  16
1. The SNMPv2 Network Management Framework

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

- the SMI, described in RFC 1902 [1] - the mechanisms used for describing and naming objects for the purpose of management.

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

1.1. Object Definitions

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

2. Overview

This document is the one in the series of documents that define various MIB object groups for IPv6. These groups are the basic unit of conformance: if the semantics of a group is applicable to an implementation, then it must implement all objects in that group. For example, an implementation must implement the TCP group if and only if it implements the TCP over IPv6 protocol. At minimum, implementations must implement the IPv6 General group [9] as well as the ICMPv6 group defined in this document.

This document defines the ICMPv6 group of the IPv6 MIB.
3. The ICMPv6 Group

IPV6-ICMP-MIB DEFINITIONS ::= BEGIN

IMPORTS
  MODULE-IDENTITY, OBJECT-TYPE,
  Counter32, mib-2 FROM SNMPv2-SMI
  MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF
  ipv6IfEntry FROM IPV6-MIB;

ipv6IcmpMIB MODULE-IDENTITY
  LAST-UPDATED "9801082155Z"
  ORGANIZATION "IETF IPv6 Working Group"
  CONTACT-INFO
    Dimitry Haskin
    Postal: Bay Networks, Inc.
    660 Technology Park Drive.
    Billerica, MA 01821
    US
    Tel: +1-978-916-8124
    E-mail: dhaskin@baynetworks.com

    Steve Onishi
    Postal: Bay Networks, Inc.
    3 Federal Street
    Billerica, MA 01821
    US
    Tel: +1-978-916-3816
    E-mail: sonishi@baynetworks.com"
DESCRIPTION
  "The MIB module for entities implementing
   the ICMPv6."
 ::= { mib-2 56 }

-- the ICMPv6 group

ipv6IcmpMIBObjects OBJECT IDENTIFIER ::= { ipv6IcmpMIB 1 }

-- Per-interface ICMPv6 statistics table

ipv6IfIcmpTable OBJECT-TYPE
  SYNTAX     SEQUENCE OF Ipv6IfIcmpEntry
  MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"IPv6 ICMP statistics. This table contains statistics of ICMPv6 messages that are received and sourced by the entity."
 ::= { ipv6IcmpMIBObjects 1 }

ipv6IfIcmpEntry OBJECT-TYPE
SYNTAX Ipv6IfIcmpEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An ICMPv6 statistics entry containing objects at a particular IPv6 interface."

Note that a receiving interface is the interface to which a given ICMPv6 message is addressed which may not be necessarily the input interface for the message.

Similarly, the sending interface is the interface that sources a given ICMP message which is usually but not necessarily the output interface for the message."
AUGMENTS { ipv6IfEntry }
 ::= { ipv6IfIcmpTable 1 }

Ipv6IfIcmpEntry ::= SEQUENCE {
  ipv6IfIcmpInMsgs Counter32 ,
  ipv6IfIcmpInErrors Counter32 ,
  ipv6IfIcmpInDestUnreachs Counter32 ,
  ipv6IfIcmpInAdminProhibs Counter32 ,
  ipv6IfIcmpInTimeExcds Counter32 ,
  ipv6IfIcmpInParmProblems Counter32 ,
  ipv6IfIcmpInPktTooBigs Counter32 ,
  ipv6IfIcmpInEchos Counter32 ,
  ipv6IfIcmpInEchoReplies Counter32 ,
  ipv6IfIcmpInRouterSolicits Counter32 ,}
ipv6IfIcmpInRouterAdvertisements
Counter32,
ipv6IfIcmpInNeighborSolicits
Counter32,
ipv6IfIcmpInNeighborAdvertisements
Counter32,
ipv6IfIcmpInRedirects
Counter32,
ipv6IfIcmpInGroupMembQueries
Counter32,
ipv6IfIcmpInGroupMembResponses
Counter32,
ipv6IfIcmpInGroupMembReductions
Counter32,
ipv6IfIcmpOutMsgs
Counter32,
ipv6IfIcmpOutErrors
Counter32,
ipv6IfIcmpOutDestUnreachs
Counter32,
ipv6IfIcmpOutAdminProhibs
Counter32,
ipv6IfIcmpOutTimeExcds
Counter32,
ipv6IfIcmpOutParmProblems
Counter32,
ipv6IfIcmpOutPktTooBigs
Counter32,
ipv6IfIcmpOutEchos
Counter32,
ipv6IfIcmpOutEchoReplies
Counter32,
ipv6IfIcmpOutRouterSolicits
Counter32,
ipv6IfIcmpOutRouterAdvertisements
Counter32,
ipv6IfIcmpOutNeighborSolicits
Counter32,
ipv6IfIcmpOutNeighborAdvertisements
Counter32,
ipv6IfIcmpOutRedirects
Counter32,
ipv6IfIcmpOutGroupMembQueries
Counter32,
ipv6IfIcmpOutGroupMembResponses
Counter32,
ipv6IfIcmpOutGroupMembReductions
Counter32
ipv6IfIcmpInMsgs OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of ICMP messages received
by the interface which includes all those
counted by ipv6IfIcmpInErrors. Note that this
interface is the interface to which the
ICMP messages were addressed which may not be
necessarily the input interface for the messages."
::= { ipv6IfIcmpEntry 1 }

ipv6IfIcmpInErrors OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP messages which the interface
received but determined as having ICMP-specific
errors (bad ICMP checksums, bad length, etc.)."
::= { ipv6IfIcmpEntry 2 }

ipv6IfIcmpInDestUnreachs OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Destination Unreachable
messages received by the interface."
::= { ipv6IfIcmpEntry 3 }

ipv6IfIcmpInAdminProhibs OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP destination
unreachable/communication administratively
prohibited messages received by the interface."
::= { ipv6IfIcmpEntry 4 }

ipv6IfIcmpInTimeExcds OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Time Exceeded messages received by the interface."
::= { ipv6IfIcmpEntry 5 }

ipv6IfIcmpInParmProblems OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of ICMP Parameter Problem messages received by the interface."
::= { ipv6IfIcmpEntry 6 }

ipv6IfIcmpInPktTooBigs OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of ICMP Packet Too Big messages received by the interface."
::= { ipv6IfIcmpEntry 7 }

ipv6IfIcmpInEchos OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of ICMP Echo (request) messages received by the interface."
::= { ipv6IfIcmpEntry 8 }

ipv6IfIcmpInEchoReplies OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of ICMP Echo Reply messages received by the interface."
::= { ipv6IfIcmpEntry 9 }

ipv6IfIcmpInRouterSolicits OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of ICMP Router Solicit messages received by the interface."
::= { ipv6IfIcmpEntry 10 }

ipv6IfIcmpInRouterAdvertisements OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMP Router Advertisement messages received by the interface."
::= { ipv6IfIcmpEntry 11 }

ipv6IfIcmpInNeighborSolicits OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMP Neighbor Solicit messages received by the interface."
::= { ipv6IfIcmpEntry 12 }

ipv6IfIcmpInNeighborAdvertisements OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMP Neighbor Advertisement messages received by the interface."
::= { ipv6IfIcmpEntry 13 }

ipv6IfIcmpInRedirects OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of Redirect messages received by the interface."
::= { ipv6IfIcmpEntry 14 }

ipv6IfIcmpInGroupMembQueries OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMPv6 Group Membership Query messages received by the interface."
::= { ipv6IfIcmpEntry 15 }

ipv6IfIcmpInGroupMembResponses OBJECT-TYPE
SYNTAX  Counter32  
MAX-ACCESS read-only  
STATUS  current  
DESCRIPTION  
"The number of ICMPv6 Group Member Response messages received by the interface."  
::= { ipv6IfIcmpEntry 16}  

ipv6IfIcmpInGroupMembReductions OBJECT-TYPE  
SYNTAX  Counter32  
MAX-ACCESS read-only  
STATUS  current  
DESCRIPTION  
"The number of ICMPv6 Group Membership Reduction messages received by the interface."  
::= { ipv6IfIcmpEntry 17}  

ipv6IfIcmpOutMsgs OBJECT-TYPE  
SYNTAX  Counter32  
MAX-ACCESS read-only  
STATUS  current  
DESCRIPTION  
"The total number of ICMP messages which this interface attempted to send. Note that this counter includes all those counted by icmpOutErrors."  
::= { ipv6IfIcmpEntry 18}  

ipv6IfIcmpOutErrors OBJECT-TYPE  
SYNTAX  Counter32  
MAX-ACCESS read-only  
STATUS  current  
DESCRIPTION  
"The number of ICMP messages which this interface did not send due to problems discovered within ICMP such as a lack of buffers. This value should not include errors discovered outside the ICMP layer such as the inability of IPv6 to route the resultant datagram. In some implementations there may be no types of error which contribute to this counter’s value."  
::= { ipv6IfIcmpEntry 19}  

ipv6IfIcmpOutDestUnreachs OBJECT-TYPE  
SYNTAX  Counter32  
MAX-ACCESS read-only  
STATUS  current  
DESCRIPTION  
"The number of ICMP Destination Unreachable
messages sent by the interface." ::= { ipv6IfIcmpEntry 20 }

ipv6IfIcmpOutAdminProhibs OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of ICMP dest unreachable/communication administratively prohibited messages sent."
 ::= { ipv6IfIcmpEntry 21 }

ipv6IfIcmpOutTimeExcds OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Time Exceeded messages sent by the interface."
 ::= { ipv6IfIcmpEntry 22 }

ipv6IfIcmpOutParmProblems OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Parameter Problem messages sent by the interface."
 ::= { ipv6IfIcmpEntry 23 }

ipv6IfIcmpOutPktTooBigs OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Packet Too Big messages sent by the interface."
 ::= { ipv6IfIcmpEntry 24 }

ipv6IfIcmpOutEchos OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Echo (request) messages sent by the interface."
 ::= { ipv6IfIcmpEntry 25 }
ipv6IfIcmpOutEchoReplies OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Echo Reply messages sent
by the interface."
::= { ipv6IfIcmpEntry 26 }

ipv6IfIcmpOutRouterSolicits OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Router Solicitation messages
sent by the interface."
::= { ipv6IfIcmpEntry 27 }

ipv6IfIcmpOutRouterAdvertisements OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Router Advertisement messages
sent by the interface."
::= { ipv6IfIcmpEntry 28 }

ipv6IfIcmpOutNeighborSolicits OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Neighbor Solicitation
messages sent by the interface."
::= { ipv6IfIcmpEntry 29 }

ipv6IfIcmpOutNeighborAdvertisements OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of ICMP Neighbor Advertisement
messages sent by the interface."
::= { ipv6IfIcmpEntry 30 }

ipv6IfIcmpOutRedirects OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
The number of Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.

::= { ipv6IfIcmpEntry 31 }

ipv6IfIcmpOutGroupMemb Queries OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMPv6 Group Membership Query messages sent."
::= { ipv6IfIcmpEntry 32 }

ipv6IfIcmpOutGroupMemb Responses OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMPv6 Group Membership Response messages sent."
::= { ipv6IfIcmpEntry 33 }

ipv6IfIcmpOutGroupMemb Reductions OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of ICMPv6 Group Membership Reduction messages sent."
::= { ipv6IfIcmpEntry 34 }

-- conformance information
ipv6IcmpConformance OBJECT IDENTIFIER ::= { ipv6IcmpMIB 2 }

ipv6IcmpCompliances
OBJECT IDENTIFIER ::= { ipv6IcmpConformance 1 }
ipv6IcmpGroups
OBJECT IDENTIFIER ::= { ipv6IcmpConformance 2 }

-- compliance statements
ipv6IcmpCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMPv2 entities which implement ICMPv6."

MODULE -- this module
MANDATORY-GROUPS { ipv6IcmpGroup }
::= { ipv6IcmpCompliances 1 }

ipv6IcmpGroup OBJECT-GROUP
OBJECTS {
  ipv6IfIcmpInMsgs,
  ipv6IfIcmpInErrors,
  ipv6IfIcmpInDestUnreaches,
  ipv6IfIcmpInAdminProhibs,
  ipv6IfIcmpInTimeExcds,
  ipv6IfIcmpInParmProblems,
  ipv6IfIcmpInPktTooBigs,
  ipv6IfIcmpInEchos,
  ipv6IfIcmpInEchoReplies,
  ipv6IfIcmpInRouterSolicits,
  ipv6IfIcmpInRouterAdvertisements,
  ipv6IfIcmpInNeighborSolicits,
  ipv6IfIcmpInNeighborAdvertisements,
  ipv6IfIcmpInRedirects,
  ipv6IfIcmpInGroupMemberQueries,
  ipv6IfIcmpInGroupMemberResponses,
  ipv6IfIcmpInGroupMemberReductions,
  ipv6IfIcmpOutMsgs,
  ipv6IfIcmpOutErrors,
  ipv6IfIcmpOutDestUnreaches,
  ipv6IfIcmpOutAdminProhibs,
  ipv6IfIcmpOutTimeExcds,
  ipv6IfIcmpOutParmProblems,
  ipv6IfIcmpOutPktTooBigs,
  ipv6IfIcmpOutEchos,
  ipv6IfIcmpOutEchoReplies,
  ipv6IfIcmpOutRouterSolicits,
  ipv6IfIcmpOutRouterAdvertisements,
  ipv6IfIcmpOutNeighborSolicits,
  ipv6IfIcmpOutNeighborAdvertisements,
  ipv6IfIcmpOutRedirects,
  ipv6IfIcmpOutGroupMemberQueries,
  ipv6IfIcmpOutGroupMemberResponses,
  ipv6IfIcmpOutGroupMemberReductions
}

STATUS current
DESCRIPTION
"The ICMPv6 group of objects providing information specific to ICMPv6."
::= { ipv6IcmpGroups 1 }
END

4. Acknowledgments

This document borrows from MIB works produced by IETF for IPv4-based internets.

We would like to thanks the following people for constructive and valuable comments:

Mike Daniele,
Margaret Forsythe,
Jean-Pierre Roch,
Juergen Schoenwaelder,
Vivek Venkatraman.

5. References

[1] SNMPv2 Working Group, Case, J., McCloghrie, K., Rose, M.,
and S.  Waldbusser, "Structure of Management Information for
Version 2 of the Simple Network Management Protocol (SNMPv2)",
RFC 1902, January 1996.

Waldbusser, "Textual Conventions for Version 2 of the Simple

Base for Network Management of TCP/IP-based internets: MIB-II",


Waldbusser, "Protocol Operations for Version 2 of the Simple


6. Security Considerations

Certain management information defined in this MIB may be considered sensitive in some network environments.

Therefore, authentication of received SNMP requests and controlled access to management information should be employed in such environments.

7. Authors' Addresses

Dimitry Haskin
Bay Networks, Inc.
600 Technology Park Drive
Billerica, MA 01821

EMail: dhaskin@baynetworks.com

Steve Onishi
Bay Networks, Inc.
3 Federal Street
Billerica, MA 01821

EMail: sonishi@baynetworks.com
8. Full Copyright Statement

Copyright (C) The Internet Society (1998). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.