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SNMPv2 Management Information Base for the Internet Protocol using SMIv2

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.

IESG Note:

The IP, UDP, and TCP MIB modules currently support only IPv4. These three modules use the IpAddress type defined as an OCTET STRING of length 4 to represent the IPv4 32-bit internet addresses. (See RFC 1902, SMI for SNMPv2.) They do not support the new 128-bit IPv6 internet addresses.

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1. Introduction

A management system contains: several (potentially many) nodes, each with a processing entity, termed an agent, which has access to management instrumentation; at least one management station; and, a management protocol, used to convey management information between the agents and management stations. Operations of the protocol are carried out under an administrative framework which defines authentication, authorization, access control, and privacy policies.

Management stations execute management applications which monitor and control managed elements. Managed elements are devices such as hosts, routers, terminal servers, etc., which are monitored and controlled via access to their management information.

Management information is viewed as a collection of managed objects, residing in a virtual information store, termed the Management Information Base (MIB). Collections of related objects are defined in MIB modules. These modules are written using a subset of OSI's Abstract Syntax Notation One (ASN.1) [1], termed the Structure of Management Information (SMI) [2].

This document is the MIB module which defines managed objects for managing implementations of the Internet Protocol (IP) [3] and its associated Internet Control Message Protocol (ICMP) [4].

The managed objects in this MIB module were originally defined using the SNMPv1 framework as a part of MIB-II [5]. Since then, the managed objects related to managing routes in an IP internet were updated by RFC 1354 [6]. This document takes the remaining MIB-II objects for these protocols, and defines them using the SNMPv2 framework.

2. Definitions

```
IP-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, Integer32,
    Counter32, IpAddress, mib-2        FROM SNMPv2-SMI
    PhysAddress                        FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP    FROM SNMPv2-CONF;


ipMIB MODULE-IDENTITY
    LAST-UPDATED "9411010000Z"
    ORGANIZATION "IETF SNMPv2 Working Group"
    CONTACT-INFO
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```

```
    DESCRIPTION
            "The MIB module for managing IP and ICMP implementations,
            but excluding their management of IP routes."
    REVISION      "9103310000Z"
    DESCRIPTION
            "The initial revision of this MIB module was part of MIB-
            II."
    ::= { mib-2 48}

-- the IP group

ip       OBJECT IDENTIFIER ::= { mib-2 4 }

ipForwarding OBJECT-TYPE
    SYNTAX      INTEGER {
                    forwarding(1),    -- acting as a router
                    notForwarding(2)  -- NOT acting as a router
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The indication of whether this entity is acting as an IP
            router in respect to the forwarding of datagrams received
            by, but not addressed to, this entity.  IP routers forward
            datagrams.  IP hosts do not (except those source-routed via
            the host)."
    ::= { ip 1 }

ipDefaultTTL OBJECT-TYPE
    SYNTAX      INTEGER (1..255)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The default value inserted into the Time-To-Live field of
            the IP header of datagrams originated at this entity,
            whenever a TTL value is not supplied by the transport layer
            protocol."
    ::= { ip 2 }

ipInReceives OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of input datagrams received from
            interfaces, including those received in error."
    ::= { ip 3 }
```

```
ipInHdrErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of input datagrams discarded due to errors in
            their IP headers, including bad checksums, version number
            mismatch, other format errors, time-to-live exceeded, errors
            discovered in processing their IP options, etc."
    ::= { ip 4 }

ipInAddrErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of input datagrams discarded because the IP
            address in their IP header's destination field was not a
            valid address to be received at this entity.  This count
            includes invalid addresses (e.g., 0.0.0.0) and addresses of
            unsupported Classes (e.g., Class E).  For entities which are
            not IP routers and therefore do not forward datagrams, this
            counter includes datagrams discarded because the destination
            address was not a local address."
    ::= { ip 5 }

ipForwDatagrams OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of input datagrams for which this entity was not
            their final IP destination, as a result of which an attempt
            was made to find a route to forward them to that final
            destination.  In entities which do not act as IP routers,
            this counter will include only those packets which were
            Source-Routed via this entity, and the Source-Route option
            processing was successful."
    ::= { ip 6 }

ipInUnknownProtos OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of locally-addressed datagrams received
            successfully but discarded because of an unknown or
            unsupported protocol."
```

```
    ::= { ip 7 }

ipInDiscards OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of input IP datagrams for which no problems were
            encountered to prevent their continued processing, but which
            were discarded (e.g., for lack of buffer space).  Note that
            this counter does not include any datagrams discarded while
            awaiting re-assembly."
    ::= { ip 8 }

ipInDelivers OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of input datagrams successfully delivered
            to IP user-protocols (including ICMP)."
    ::= { ip 9 }

ipOutRequests OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of IP datagrams which local IP user-
            protocols (including ICMP) supplied to IP in requests for
            transmission.  Note that this counter does not include any
            datagrams counted in ipForwDatagrams."
    ::= { ip 10 }

ipOutDiscards OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of output IP datagrams for which no problem was
            encountered to prevent their transmission to their
            destination, but which were discarded (e.g., for lack of
            buffer space).  Note that this counter would include
            datagrams counted in ipForwDatagrams if any such packets met
            this (discretionary) discard criterion."
    ::= { ip 11 }

ipOutNoRoutes OBJECT-TYPE
```

```
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of IP datagrams discarded because no route could
            be found to transmit them to their destination.  Note that
            this counter includes any packets counted in ipForwDatagrams
            which meet this `no-route' criterion.  Note that this
            includes any datagrams which a host cannot route because all
            of its default routers are down."
    ::= { ip 12 }

ipReasmTimeout OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The maximum number of seconds which received fragments are
            held while they are awaiting reassembly at this entity."
    ::= { ip 13 }

ipReasmReqds OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of IP fragments received which needed to be
            reassembled at this entity."
    ::= { ip 14 }

ipReasmOKs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of IP datagrams successfully re-assembled."
    ::= { ip 15 }

ipReasmFails OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of failures detected by the IP re-assembly
            algorithm (for whatever reason: timed out, errors, etc).
            Note that this is not necessarily a count of discarded IP
            fragments since some algorithms (notably the algorithm in
            RFC 815) can lose track of the number of fragments by
```

```
            combining them as they are received."
    ::= { ip 16 }

ipFragOKs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of IP datagrams that have been successfully
            fragmented at this entity."
    ::= { ip 17 }

ipFragFails OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of IP datagrams that have been discarded because
            they needed to be fragmented at this entity but could not
            be, e.g., because their Don't Fragment flag was set."
    ::= { ip 18 }

ipFragCreates OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of IP datagram fragments that have been
            generated as a result of fragmentation at this entity."
    ::= { ip 19 }

-- the IP address table

ipAddrTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IpAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The table of addressing information relevant to this
            entity's IP addresses."
    ::= { ip 20 }

ipAddrEntry OBJECT-TYPE
    SYNTAX      IpAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The addressing information for one of this entity's IP
```

```
            addresses."
    INDEX       { ipAdEntAddr }
    ::= { ipAddrTable 1 }

IpAddrEntry ::= SEQUENCE {
        ipAdEntAddr          IpAddress,
        ipAdEntIfIndex       INTEGER,
        ipAdEntNetMask       IpAddress,
        ipAdEntBcastAddr     INTEGER,
        ipAdEntReasmMaxSize  INTEGER
    }

ipAdEntAddr OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The IP address to which this entry's addressing information
            pertains."
    ::= { ipAddrEntry 1 }

ipAdEntIfIndex OBJECT-TYPE
    SYNTAX      INTEGER (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The index value which uniquely identifies the interface to
            which this entry is applicable.  The interface identified by
            a particular value of this index is the same interface as
            identified by the same value of RFC 1573's ifIndex."
    ::= { ipAddrEntry 2 }

ipAdEntNetMask OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The subnet mask associated with the IP address of this
            entry.  The value of the mask is an IP address with all the
            network bits set to 1 and all the hosts bits set to 0."
    ::= { ipAddrEntry 3 }

ipAdEntBcastAddr OBJECT-TYPE
    SYNTAX      INTEGER (0..1)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The value of the least-significant bit in the IP broadcast
```

```
            address used for sending datagrams on the (logical)
            interface associated with the IP address of this entry.  For
            example, when the Internet standard all-ones broadcast
            address is used, the value will be 1.  This value applies to
            both the subnet and network broadcasts addresses used by the
            entity on this (logical) interface."
    ::= { ipAddrEntry 4 }

ipAdEntReasmMaxSize OBJECT-TYPE
    SYNTAX      INTEGER (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The size of the largest IP datagram which this entity can
            re-assemble from incoming IP fragmented datagrams received
            on this interface."
    ::= { ipAddrEntry 5 }


-- ipRouteTable  ::=   { ip 21 }        obsolete

-- the IP Address Translation table

-- The Address Translation tables contain the IpAddress to
-- "physical" address equivalences.  Some interfaces do not
-- use translation tables for determining address
-- equivalences (e.g., DDN-X.25 has an algorithmic method);
-- if all interfaces are of this type, then the Address
-- Translation table is empty, i.e., has zero entries.

ipNetToMediaTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IpNetToMediaEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The IP Address Translation table used for mapping from IP
            addresses to physical addresses."
    ::= { ip 22 }

ipNetToMediaEntry OBJECT-TYPE
    SYNTAX      IpNetToMediaEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Each entry contains one IpAddress to `physical' address
            equivalence."
    INDEX       { ipNetToMediaIfIndex,
                  ipNetToMediaNetAddress }
```

```
    ::= { ipNetToMediaTable 1 }

IpNetToMediaEntry ::= SEQUENCE {
        ipNetToMediaIfIndex      INTEGER,
        ipNetToMediaPhysAddress  PhysAddress,
        ipNetToMediaNetAddress   IpAddress,
        ipNetToMediaType         INTEGER
    }

ipNetToMediaIfIndex OBJECT-TYPE
    SYNTAX      INTEGER (1..2147483647)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The interface on which this entry's equivalence is
            effective.  The interface identified by a particular value
            of this index is the same interface as identified by the
            same value of RFC 1573's ifIndex."
    ::= { ipNetToMediaEntry 1 }

ipNetToMediaPhysAddress OBJECT-TYPE
    SYNTAX      PhysAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The media-dependent `physical' address."
    ::= { ipNetToMediaEntry 2 }

ipNetToMediaNetAddress OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The IpAddress corresponding to the media-dependent
            `physical' address."
    ::= { ipNetToMediaEntry 3 }

ipNetToMediaType OBJECT-TYPE
    SYNTAX      INTEGER {
                other(1),        -- none of the following
                invalid(2),      -- an invalidated mapping
                dynamic(3),
                static(4)
            }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "The type of mapping.
```

```
            Setting this object to the value invalid(2) has the effect
            of invalidating the corresponding entry in the
            ipNetToMediaTable.  That is, it effectively disassociates
            the interface identified with said entry from the mapping
            identified with said entry.  It is an implementation-
            specific matter as to whether the agent removes an
            invalidated entry from the table.  Accordingly, management
            stations must be prepared to receive tabular information
            from agents that corresponds to entries not currently in
            use.  Proper interpretation of such entries requires
            examination of the relevant ipNetToMediaType object."
    ::= { ipNetToMediaEntry 4 }

ipRoutingDiscards OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of routing entries which were chosen to be
            discarded even though they are valid.  One possible reason
            for discarding such an entry could be to free-up buffer
            space for other routing entries."
    ::= { ip 23 }

-- the ICMP group

icmp     OBJECT IDENTIFIER ::= { mib-2 5 }

icmpInMsgs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of ICMP messages which the entity
            received.  Note that this counter includes all those counted
            by icmpInErrors."
    ::= { icmp 1 }

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

```
icmpInDestUnreachs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Destination Unreachable messages
            received."
    ::= { icmp 3 }

icmpInTimeExcds OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Time Exceeded messages received."
    ::= { icmp 4 }

icmpInParmProbs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Parameter Problem messages received."
    ::= { icmp 5 }

icmpInSrcQuenchs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Source Quench messages received."
    ::= { icmp 6 }

icmpInRedirects OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Redirect messages received."
    ::= { icmp 7 }

icmpInEchos OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Echo (request) messages received."
    ::= { icmp 8 }
```

```
icmpInEchoReps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Echo Reply messages received."
    ::= { icmp 9 }

icmpInTimestamps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Timestamp (request) messages received."
    ::= { icmp 10 }

icmpInTimestampReps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Timestamp Reply messages received."
    ::= { icmp 11 }

icmpInAddrMasks OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Address Mask Request messages received."
    ::= { icmp 12 }

icmpInAddrMaskReps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Address Mask Reply messages received."
    ::= { icmp 13 }

icmpOutMsgs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of ICMP messages which this entity
            attempted to send.  Note that this counter includes all
            those counted by icmpOutErrors."
```

```
    ::= { icmp 14 }

icmpOutErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP messages which this entity 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 IP to route
            the resultant datagram.  In some implementations there may
            be no types of error which contribute to this counter's
            value."
    ::= { icmp 15 }

icmpOutDestUnreachs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Destination Unreachable messages sent."
    ::= { icmp 16 }

icmpOutTimeExcds OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Time Exceeded messages sent."
    ::= { icmp 17 }

icmpOutParmProbs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Parameter Problem messages sent."
    ::= { icmp 18 }

icmpOutSrcQuenchs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Source Quench messages sent."
    ::= { icmp 19 }
```

```
icmpOutRedirects OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Redirect messages sent.  For a host,
            this object will always be zero, since hosts do not send
            redirects."
    ::= { icmp 20 }

icmpOutEchos OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Echo (request) messages sent."
    ::= { icmp 21 }

icmpOutEchoReps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Echo Reply messages sent."
    ::= { icmp 22 }

icmpOutTimestamps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Timestamp (request) messages sent."
    ::= { icmp 23 }

icmpOutTimestampReps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Timestamp Reply messages sent."
    ::= { icmp 24 }

icmpOutAddrMasks OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Address Mask Request messages sent."
```

```
    ::= { icmp 25 }

icmpOutAddrMaskReps OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of ICMP Address Mask Reply messages sent."
    ::= { icmp 26 }

-- conformance information

ipMIBConformance OBJECT IDENTIFIER ::= { ipMIB 2 }

ipMIBCompliances OBJECT IDENTIFIER ::= { ipMIBConformance 1 }
ipMIBGroups      OBJECT IDENTIFIER ::= { ipMIBConformance 2 }


-- compliance statements

ipMIBCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for SNMPv2 entities which
            implement IP."
    MODULE  -- this module
        MANDATORY-GROUPS { ipGroup,
                           icmpGroup }
    ::= { ipMIBCompliances 1 }

-- units of conformance

ipGroup OBJECT-GROUP
    OBJECTS   { ipForwarding, ipDefaultTTL, ipInReceives,
                ipInHdrErrors, ipInAddrErrors,
                ipForwDatagrams, ipInUnknownProtos,
                ipInDiscards, ipInDelivers, ipOutRequests,
                ipOutDiscards, ipOutNoRoutes,
                ipReasmTimeout, ipReasmReqds, ipReasmOKs,
                ipReasmFails, ipFragOKs,
                ipFragFails, ipFragCreates,
                ipAdEntAddr, ipAdEntIfIndex, ipAdEntNetMask,
                ipAdEntBcastAddr, ipAdEntReasmMaxSize,
                ipNetToMediaIfIndex, ipNetToMediaPhysAddress,
                ipNetToMediaNetAddress, ipNetToMediaType,
                ipRoutingDiscards }
    STATUS    current
    DESCRIPTION
```

```
            "The ip group of objects providing for basic management of
            IP entities, exclusive of the management of IP routes."
    ::= { ipMIBGroups 1 }

icmpGroup OBJECT-GROUP
    OBJECTS   { icmpInMsgs, icmpInErrors,
                icmpInDestUnreachs, icmpInTimeExcds,
                icmpInParmProbs, icmpInSrcQuenchs,
                icmpInRedirects, icmpInEchos,
                icmpInEchoReps, icmpInTimestamps,
                icmpInTimestampReps, icmpInAddrMasks,
                icmpInAddrMaskReps, icmpOutMsgs,
                icmpOutErrors, icmpOutDestUnreachs,
                icmpOutTimeExcds, icmpOutParmProbs,
                icmpOutSrcQuenchs, icmpOutRedirects,
                icmpOutEchos, icmpOutEchoReps,
                icmpOutTimestamps, icmpOutTimestampReps,
                icmpOutAddrMasks, icmpOutAddrMaskReps }
    STATUS    current
    DESCRIPTION
            "The icmp group of objects providing ICMP statistics."
    ::= { ipMIBGroups 2 }

END
```

3. Acknowledgements

This document contains a modified subset of RFC 1213.

4. References

[1] Information processing systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1), International Organization for Standardization. International Standard 8824, (December, 1987).

[2] McCloghrie, K., Editor, "Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1902, Cisco Systems, January 1996.

[3] Postel, J., "Internet Protocol - DARPA Internet Program Protocol Specification", STD 5, RFC 791, DARPA, September 1981.

[4] Postel, J., "Internet Control Message Protocol - DARPA Internet Program Protocol Specification", STD 5, RFC 792, USC/Information Sciences Institute, September 1981.

[5] McCloghrie, K., and M. Rose, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, RFC 1213, March 1991.

[6] Baker, F., "IP Forwarding Table MIB", RFC 1354, ACC, July 1992.

5. Security Considerations

Security issues are not discussed in this memo.

6. Editor's Address

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