

IPv6 MIB Revision Design Team
INTERNET-DRAFT
Expires: January 2002

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July 2001

**Management Information Base
for the User Datagram Protocol (UDP)
draft-ietf-ipngwg-rfc2013-update-00.txt**

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects used for implementations of the User Datagram Protocol (UDP) [[4](#)] in an IP version independent manner.

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[1. The SNMP Management Framework](#)

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#) [[5](#)].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in STD 16, [RFC 1155](#) [[6](#)], STD 16, [RFC 1212](#) [[7](#)] and [RFC 1215](#) [[8](#)]. The second version, called SMIV2, is described in STD 58, [RFC 2578](#) [[9](#)], STD 58, [RFC 2579](#) [[10](#)] and STD 58, [RFC 2580](#) [[11](#)].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, [RFC 1157](#) [[12](#)]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [[13](#)] and [RFC 1906](#) [[14](#)]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [[14](#)], [RFC 2572](#) [[15](#)] and [RFC 2574](#) [[16](#)].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, [RFC 1157](#) [[12](#)]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [[17](#)].
- o A set of fundamental applications described in [RFC 2573](#) [[18](#)] and the view-based access control mechanism described in [RFC 2575](#) [[19](#)].

A more detailed introduction to the current SNMP Management Framework can be found in [RFC 2570](#) [[20](#)].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

2. Revision History

Changes from [draft-ops-rfc2013-update-00.txt](#)

12 Jul 2001

Turned into IPNG WG document

Changes from first draft posted to v6mib mailing list:

23 Feb 2001

Made threshold for HC packet counters 1Mpps

Added copyright statements and table of contents

21 Feb 2001 -- Juergen's changes

Renamed udpInetTable to udpListenerTable

Updated Conformance info

6 Feb 2001

Removed v6-only objects.

Removed remote and instance objects, turning the table back into a listener-only table.

Renamed inetUdp* to udpInet*

Added HC in and out datagram counters

Added SIZE restriction to udpListenerLocalAddress. (36 = 32-byte addresses plus 4-byte scope, but it's just a strawman)

Used InetPortNumber TC from updated INET-ADDRESS-MIB

Updated compliance statements.

Added Keith to authors

Added open issues section.

3. Definitions

UDP-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, Counter32, Counter64,
IpAddress, mib-2 FROM SNMPv2-SMI
MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF
InetAddress, InetAddressType,
InetPortNumber FROM INET-ADDRESS-MIB;

udpMIB MODULE-IDENTITY

LAST-UPDATED "200102210000Z"
ORGANIZATION "IETF IPv6 MIB Revision Team"
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DESCRIPTION

"The MIB module for managing UDP implementations."

REVISION "200102210000Z"

DESCRIPTION

"IP version neutral revision, published as RFC XXXX."

REVISION "9411010000Z"

DESCRIPTION

"Initial SMIPv2 version, published as [RFC 2013](#)."

REVISION "9103310000Z"

DESCRIPTION

"The initial revision of this MIB module was part of MIB-II."

::= { mib-2 50 }

-- the UDP group

udp OBJECT IDENTIFIER ::= { mib-2 7 }

udpInDatagrams OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of UDP datagrams delivered to UDP users."

::= { udp 1 }

udpNoPorts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of received UDP datagrams for which there
was no application at the destination port."

::= { udp 2 }

udpInErrors OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of received UDP datagrams that could not be
delivered for reasons other than the lack of an application
at the destination port."

::= { udp 3 }

udpOutDatagrams OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of UDP datagrams sent from this entity."

::= { udp 4 }

udpHCInDatagrams OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of UDP datagrams delivered to UDP users,
for devices which can receive more than 1 million UDP
packets per second."

::= { udp 26 }

udpHCOutDatagrams OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of UDP datagrams sent from this entity, for devices which can transmit more than 1 million UDP packets per second."

::= { udp 27 }

-- The UDP Listener table

-- The UDP listener table contains information about this
-- entity's UDP end-points on which a local application is
-- currently accepting datagrams.

udpListenerTable OBJECT-TYPE

SYNTAX SEQUENCE OF UdpListenerEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing UDP listener information."

::= { udp 7 }

udpListenerEntry OBJECT-TYPE

SYNTAX UdpListenerEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about a particular current UDP listener."

INDEX { udpListenerLocalAddressType,
udpListenerLocalAddress,
udpListenerLocalPort }

::= { udpListenerTable 1 }

UdpListenerEntry ::= SEQUENCE {
udpListenerLocalAddressType InetAddressType,
udpListenerLocalAddress InetAddress,
udpListenerLocalPort InetPortNumber
}

udpListenerLocalAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address type of udpListenerLocalAddress"


```
::= { udpListenerEntry 1 }
```

udpListenerLocalAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE(0..36))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The local IP address for this UDP listener. In the case of a UDP listener which is willing to accept datagrams for any IP interface associated with the node, a value of all zeroes is used."

```
::= { udpListenerEntry 2 }
```

udpListenerLocalPort OBJECT-TYPE

SYNTAX InetPortNumber

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The local port number for this UDP listener."

```
::= { udpListenerEntry 3 }
```

-- The deprecated UDP Listener table

-- The UDP listener table contains information about this
-- entity's IPv4 UDP end-points on which a local application is
-- currently accepting datagrams.

udpTable OBJECT-TYPE

SYNTAX SEQUENCE OF UdpEntry

MAX-ACCESS not-accessible

STATUS deprecated

DESCRIPTION

"A table containing IPv4-specific UDP listener information. It contains information about all local IPv4 UDP end-points on which an application is currently accepting datagrams. This table has been deprecated in favor of the version neutral udpListenerTable."

```
::= { udp 5 }
```

udpEntry OBJECT-TYPE

SYNTAX UdpEntry

MAX-ACCESS not-accessible

STATUS deprecated

DESCRIPTION

"Information about a particular current UDP listener."

INDEX { udpLocalAddress, udpLocalPort }


```
::= { udpTable 1 }
```

```
UdpEntry ::= SEQUENCE {  
    udpLocalAddress  IpAddress,  
    udpLocalPort     INTEGER  
}
```

udpLocalAddress OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS deprecated

DESCRIPTION

"The local IP address for this UDP listener. In the case of a UDP listener which is willing to accept datagrams for any IP interface associated with the node, the value 0.0.0.0 is used."

```
::= { udpEntry 1 }
```

udpLocalPort OBJECT-TYPE

SYNTAX INTEGER (0..65535)

MAX-ACCESS read-only

STATUS deprecated

DESCRIPTION

"The local port number for this UDP listener."

```
::= { udpEntry 2 }
```

-- conformance information

udpMIBConformance OBJECT IDENTIFIER ::= { udpMIB 2 }

udpMIBCompliances OBJECT IDENTIFIER ::= { udpMIBConformance 1 }

udpMIBGroups OBJECT IDENTIFIER ::= { udpMIBConformance 2 }

-- compliance statements

udpMIBCompliance2 MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for systems which implement UDP."

MODULE -- this module

MANDATORY-GROUPS { udpBaseGroup, udpListenerGroup }

GROUP udpHCGroup

DESCRIPTION

"This group is mandatory for those systems which are capable of receiving or transmitting more than 1 million UDP


```
        packets per second. 1 million packets per second will
        cause a Counter32 to wrap in just over an hour."
 ::= { udpMIBCompliances 2 }
```

udpMIBCompliance MODULE-COMPLIANCE

STATUS deprecated

DESCRIPTION

"The compliance statement for IPv4-only systems which implement UDP. For IP version independence, this compliance statement is deprecated in favor of udpMIBCompliance2."

MODULE -- this module

MANDATORY-GROUPS { udpGroup }

::= { udpMIBCompliances 1 }

-- units of conformance

udpGroup OBJECT-GROUP

OBJECTS { udpInDatagrams, udpNoPorts,
 udpInErrors, udpOutDatagrams,
 udpLocalAddress, udpLocalPort }

STATUS deprecated

DESCRIPTION

"The deprecated group of objects providing for management of UDP over IPv4."

::= { udpMIBGroups 1 }

udpBaseGroup OBJECT-GROUP

OBJECTS { udpInDatagrams, udpNoPorts, udpInErrors, udpOutDatagrams }

STATUS current

DESCRIPTION

"The group of objects providing for counters of UDP statistics."

::= { udpMIBGroups 2 }

udpHCGroup OBJECT-GROUP

OBJECTS { udpHCInDatagrams, udpHCOutDatagrams }

STATUS current

DESCRIPTION

"The group of objects providing for counters of high speed UDP implementations."

::= { udpMIBGroups 3 }

udpListenerGroup OBJECT-GROUP

OBJECTS { udpListenerLocalPort }

STATUS current

DESCRIPTION

"The group of objects providing for the IP version independent management of UDP listeners."


```
::= { udpMIBGroups 4 }
```

END

4. Open Issues

[optional] connection table to more fully specify sockets?

Per-connection/listener datagram / octet count objects in an optional conformance group?

IPV6_V6ONLY?

5. Acknowledgements

This document contains a modified subset of [RFC 1213](#) and updates RFC [2013](#) and [RFC 2454](#).

6. References

- [1] Rose, M. and K. McCloghrie, "Management Information Base for Network Management of TCP/IP-based internets", [RFC 1213](#), March 1991.
- [2] K. McCloghrie, "SNMPv2 Management Information Base for the User Datagram Protocol using SMIV2", [RFC 2013](#), November 1996.
- [3] Haskin, D. and S. Onishi, "IP Version 6 Management Information Base for the User Datagram Protocol", [RFC 2454](#), December 1998.
- [4] Postel, J., "User Datagram Protocol", STD 6, [RFC 768](#), DARPA, August 1980.
- [5] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing SNMP Management Frameworks", [RFC 2571](#), April 1999.
- [6] Rose, M., and K. McCloghrie, "Structure and Identification of Management Information for TCP/IP-based Internets", STD 16, [RFC 1155](#), May 1990.
- [7] Rose, M., and K. McCloghrie, "Concise MIB Definitions", STD 16, [RFC 1212](#), March 1991.
- [8] Rose, M., "A Convention for Defining Traps for use with the SNMP", [RFC 1215](#), March 1991.

- [9] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [10] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [11] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.
- [12] Case, J., Fedor, M., Schoffstall, M., and J. Davin, "Simple Network Management Protocol", STD 15, [RFC 1157](#), May 1990.
- [13] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Introduction to Community-based SNMPv2", [RFC 1901](#), January 1996.
- [14] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1906](#), January 1996.
- [15] Case, J., Harrington D., Presuhn R., and B. Wijnen, "Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)", [RFC 2572](#), April 1999.
- [16] Blumenthal, U., and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", [RFC 2574](#), April 1999.
- [17] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1905](#), January 1996.
- [18] Levi, D., Meyer, P., and B. Stewart, "SNMPv3 Applications", [RFC 2573](#), April 1999.
- [19] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", [RFC 2575](#), April 1999.
- [20] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction to Version 3 of the Internet-standard Network Management Framework", [RFC 2570](#), April 1999.

7. Security Considerations

There are no management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. So, if this MIB is implemented correctly, then there is no risk that an intruder can alter or create any management objects of this MIB via direct SNMP SET operations.

There are a number of managed objects in this MIB that may contain sensitive information. These are:

- o The udpListenerLocalPort and udpLocalPort objects can be used to identify what ports are open on the machine and can thus what attacks are likely to succeed, without the attacker having to run a port scanner.

It is thus important to control even GET access to these objects and possibly to even encrypt the values of these object when sending them over the network via SNMP. Not all versions of SNMP provide features for such a secure environment.

SNMPv1 by itself is not a secure environment. 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.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [16] and the View-based Access Control Model [RFC 2575](#) [19] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, 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.

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[9.](#) Full Copyright Statement

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