

**IP Version 6 Management Information Base  
for the User Datagram Protocol**

[<draft-ietf-ipngwg-ipv6-udp-mib-01.txt>](mailto:draft-ietf-ipngwg-ipv6-udp-mib-01.txt)

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Abstract

This document is one in the series of documents that define various MIB objects for IPv6. Specifically, this document is the MIB module which defines managed objects for implementations of the User Datagram Protocol (UDP) over IP Version 6 (IPv6).

This document also recommends a specific policy with respect to the applicability of [RFC 2013](#) for implementations of IPv6. Namely, that most of managed objects defined in [RFC 2013](#) are independent of which IP versions underlie UDP, and only the UDP listener information is IP version-specific.

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

**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].

## **2. Overview**

This document is one in the series of documents that define various MIB objects, and statements of conformance, for IPv6. This document defines the required instrumentation for implementations of UDP over IPv6.

## **3. Transparency of IP versions to UDP**

The fact that UDP is carried over IPv6 as opposed to IPv4, is largely invisible to a UDP implementation. A "UDPng" did not need to be defined, implementations simply need to support IPv6 addresses.

As such, the managed objects already defined in [UDP MIB] are sufficient for managing UDP in the presence of IPv6. These objects are equally applicable whether the managed node supports IPv4 only, IPv6 only, or both IPv4 and IPv6.

For example, `udpInDatagrams` counts "The total number of UDP datagrams delivered to UDP users", regardless of which version of IP is used to deliver any of those datagrams.

Stated differently, UDP implementations don't need separate counters for IPv4 and for IPv6.

## **4. Representing UDP Listeners**

The exception to the statements in [section 3](#) is the `udpTable`. Since IPv6 addresses cannot be represented with the `IpAddress` syntax, not all UDP endpoints can be represented in the `udpTable` defined in [UDP MIB].

This memo defines a new, separate table to represent only those UDP endpoints that utilize an IPv6 address. UDP endpoints on IPv4 addresses continue to be represented in udpTable [UDP MIB].

A different approach would have been to define a new table to represent all UDP endpoints regardless of IP version. This would require changes to [UDP MIB] and hence to existing (IPv4-only) UDP implementations. The approach suggested in this memo has the advantage of leaving IPv4-only implementations intact.

It is assumed that the objects defined in this memo will eventually be defined in an update to [UDP MIB]. For this reason, the module identity is assigned under the experimental portion of the MIB.

## **5. Conformance**

This memo contains conformance statements to define conformance to this MIB for UDP over IPv6 implementations.

## **6. Definitions**

IPV6-UDP-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF  
MODULE-IDENTITY, OBJECT-TYPE,  
mib-2, experimental FROM SNMPv2-SMI  
Ipv6Address, Ipv6IfIndexOrZero FROM IPV6-TC;

ipv6UdpMIB MODULE-IDENTITY

LAST-UPDATED "9801290000Z"

ORGANIZATION "IETF IPv6 MIB Working Group"

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DESCRIPTION

"The MIB module for entities implementing UDP over IPv6."  
::= { experimental XXX }

-- objects specific to UDP for IPv6

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

-- the UDP over IPv6 Listener table

-- This table contains information about this entity's  
-- UDP/IPv6 endpoints. Only endpoints utilizing IPv6 addresses  
-- are contained in this table. This entity's UDP/IPv4 endpoints  
-- are contained in udpTable.

ipv6UdpTable OBJECT-TYPE

SYNTAX SEQUENCE OF Ipv6UdpEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing UDP listener information for  
UDP/IPv6 endpoints."

::= { udp 6 }

ipv6UdpEntry OBJECT-TYPE

SYNTAX Ipv6UdpEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about a particular current UDP listener.

Note that conceptual rows in this table require an  
additional index object compared to udpTable, since  
IPv6 addresses are not guaranteed to be unique on the  
managed node."

INDEX { ipv6UdpLocalAddress,  
ipv6UdpLocalPort,  
ipv6UdpIfIndex }

::= { ipv6UdpTable 1 }

Ipv6UdpEntry ::= SEQUENCE {

ipv6UdpLocalAddress Ipv6Address,

ipv6UdpLocalPort INTEGER (0..65535),

ipv6UdpIfIndex Ipv6IfIndexOrZero }

ipv6UdpLocalAddress OBJECT-TYPE

SYNTAX Ipv6Address

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The local IPv6 address for this UDP listener.  
In the case of a UDP listener which is willing  
to accept datagrams for any IPv6 address  
associated with the managed node, the value ::0  
is used."

::= { ipv6UdpEntry 1 }

ipv6UdpLocalPort OBJECT-TYPE

SYNTAX INTEGER (0..65535)

MAX-ACCESS not-accessible

```
STATUS      current
DESCRIPTION
    "The local port number for this UDP listener."
::= { ipv6UdpEntry 2 }
```

ipv6UdpIfIndex OBJECT-TYPE

```
SYNTAX      Ipv6IfIndexOrZero
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

"An index object used to disambiguate conceptual rows in the table, since the ipv6UdpLocalAddress/ipv6UdpLocalPort pair may not be unique.

This object identifies the local interface that is associated with ipv6UdpLocalAddress for this UDP listener. If such a local interface cannot be determined, this object should take on the value 0. (A possible example of this would be if the value of ipv6UdpLocalAddress is ::0.)

The interface identified by a particular non-0 value of this index is the same interface as identified by the same value of ipv6IfIndex.

The value of this object must remain constant during the life of this UDP endpoint."

```
::= { ipv6UdpEntry 3 }
```

```
--
-- conformance information
--
```

```
ipv6UdpConformance OBJECT IDENTIFIER ::= { ipv6UdpMIB 2 }
```

```
ipv6UdpCompliances OBJECT IDENTIFIER ::= { ipv6UdpConformance 1 }
```

```
ipv6UdpGroups      OBJECT IDENTIFIER ::= { ipv6UdpConformance 2 }
```

```
-- compliance statements
```

ipv6UdpCompliance MODULE-COMPLIANCE

```
STATUS      current
```

```
DESCRIPTION
```

"The compliance statement for SNMPv2 entities which implement UDP over IPv6."

```
MODULE      -- this module
```

```
MANDATORY-GROUPS { ipv6UdpGroup }
```

```
::= { ipv6UdpCompliances 1 }
```

ipv6UdpGroup OBJECT-GROUP

```
OBJECTS      { -- these are defined in this module
                -- ipv6UdpLocalAddress (not-accessible)
                -- ipv6UdpLocalPort (not-accessible)
```

```

        ipv6UdpIfIndex }
STATUS      current
DESCRIPTION
    "The group of objects providing management of
      UDP over IPv6."
 ::= { ipv6UdpGroups 1 }

```

END

## 7. Acknowledgments

This memo is a product of the IPng work group, and benefited especially from the contributions of the following working group members:

Dimitry Haskin	Bay Networks
Margaret Forsythe	Epilogue
Tim Hartrick	Mentat
Frank Solensky	FTP
Jack McCann	DEC

## 8. 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.

### [UDP MIB]

SNMPv2 Working Group, McCloghrie, K., Editor,  
 "SNMPv2 Management Information Base for the User  
 Datagram Protocol using SMIPv2", [RFC 2013](#), November 1996.

### [IPv6 MIB TC]

Haskin, D., and S. Onishi, "Management Information Base for IP Version 6: Textual Conventions and General Group", Work in progress.

### [IPv6]

Deering, S., and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", [RFC 1883](#), December 1995.

## 9. 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.

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Expires July, 1998