

IDMR Working Group  
Internet Draft

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Experimental

## Protocol Independent Multicast MIB for IP

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### [1.](#) 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 managing the Protocol Independent Multicast (PIM) protocol for IPv4 and IPv6.

### [2.](#) Introduction

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 managing the

Protocol Independent Multicast (PIM) protocol [1,2,3,4,5]. This MIB module is applicable to IPv4 and IPv6 multicast routers which implement PIM. This MIB extends the MIB proposed in [6]. This MIB does not support management of PIM for other address families. Such management may be supported by other MIBs.

### 3. The SNMP Network Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2271](#) [7].
- 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 [RFC 1155](#) [8], [RFC 1212](#) [9] and [RFC 1215](#) [10]. The second version, called SMIV2, is described in [RFC 2578](#) [11], [RFC 2579](#) [12] and [RFC 2580](#) [13].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in [RFC 1157](#) [14]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [15] and [RFC 1906](#) [16]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [16], [RFC 2572](#) [17] and [RFC 2574](#) [18].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in [RFC 1157](#) [14]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [19].
- o A set of fundamental applications described in [RFC 2573](#) [20] and the view-based access control mechanism described in [RFC 2575](#) [21].

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.

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#### [4.](#) Overview

This MIB module contains one scalar and eight tables. Some of the objects in these tables are deprecated. This MIB contains deprecated objects since they are necessary for managing PIMv1 routers, but PIMv1 itself is obsoleted by PIMv2 [3,4].

The tables contained in this MIB are:

- (1) The PIM Interface Table contains one row for each of the router's PIM interfaces.
- (2) The PIM Neighbor Table contains one row for each of the router's PIM neighbors.
- (3) The PIM IP Multicast Route Table contains one row for each multicast routing entry whose incoming interface is running PIM.
- (4) The PIM Next Hop Table contains one row for each outgoing interface list entry in the multicast routing table whose interface is running PIM, and whose state is pruned.
- (5) The (deprecated) PIM RP Table contains the PIM (version 1) information for IP multicast groups which is common to all RPs of a group.
- (6) The PIM RP-Set Table contains the PIM (version 2) information for sets of candidate Rendezvous Points (RPs) for multicast group addresses with particular address prefixes.
- (7) The PIM Candidate-RP Table contains the multicast groups for which the local router is to advertise itself as a Candidate-RP. If this table is empty, then the local router advertises itself as a Candidate-RP for all groups.

(8) The PIM Component Table contains one row for each of the PIM domains to which the router is connected.

## 5. Definitions

PIMG-MIB DEFINITIONS ::= BEGIN

### IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, experimental,  
NOTIFICATION-TYPE,  
Integer32, TimeTicks FROM SNMPv2-SMI  
RowStatus, TruthValue FROM SNMPv2-TC  
MODULE-COMPLIANCE, OBJECT-GROUP,  
NOTIFICATION-GROUP FROM SNMPv2-CONF  
inetMRouteGroupType, inetMRouteGroup, inetMRouteGroupMaskLen,  
inetMRouteSourceType, inetMRouteSource, inetMRouteSourceMaskLen,

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inetMRouteNextHopGroupType, inetMRouteNextHopGroup,  
inetMRouteNextHopSourceType, inetMRouteNextHopSource,  
inetMRouteNextHopSourceMaskLen,  
inetMRouteNextHopIfIndex, inetMRouteNextHopAddressType,  
inetMRouteNextHopAddress FROM INETMROUTE-STD-MIB  
InterfaceIndex FROM IF-MIB  
InetAddress, InetAddressType FROM INET-ADDRESS-MIB;

### pimgMIB MODULE-IDENTITY

LAST-UPDATED "200003091200Z" -- March 9, 2000

ORGANIZATION "IETF IDMR Working Group."

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DESCRIPTION

"The MIB module for management of PIM routers."

REVISION "200003091200Z" -- March 9, 2000

DESCRIPTION

"Initial version, published as RFC xxxx (to be filled in  
by RFC-Editor)."

::= { experimental XX }

pimgMIBObjects OBJECT IDENTIFIER ::= { pimgMIB 1 }

pimgTraps OBJECT IDENTIFIER ::= { pimgMIBObjects 0 }

pimg OBJECT IDENTIFIER ::= { pimgMIBObjects 1 }

pimgJoinPruneInterval OBJECT-TYPE

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SYNTAX Integer32

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The default interval at which periodic PIM-SM

Join/Prune

messages are to be sent."

::= { pimg 1 }

-- The PIM Interface Table

pimgInterfaceTable OBJECT-TYPE

SYNTAX SEQUENCE OF PimgInterfaceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The (conceptual) table listing the router's PIM  
interfaces. IGMP and PIM are enabled on all interfaces  
listed in this table."

::= { pimg 2 }

```

pimInterfaceEntry OBJECT-TYPE
    SYNTAX      PimInterfaceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the pimInterfaceTable."
    INDEX       { pimInterfaceIfIndex }
    ::= { pimInterfaceTable 1 }

```

```

PimInterfaceEntry ::= SEQUENCE {
    pimInterfaceIfIndex      InterfaceIndex,
    pimInterfaceAddressType  InetAddressType,
    pimInterfaceAddress      InetAddress,
    pimInterfaceNetMaskLen   INTEGER,
    pimInterfaceMode         INTEGER,
    pimInterfaceDRType       InetAddressType,
    pimInterfaceDR           InetAddress,
    pimInterfaceHelloInterval Integer32,
    pimInterfaceStatus       RowStatus,
    pimInterfaceJoinPruneInterval Integer32,
    pimInterfaceCBSRPreference Integer32
}

```

```

pimInterfaceIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ifIndex value of this PIM interface."
    ::= { pimInterfaceEntry 1 }

```

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```

pimInterfaceAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A value indicating the address family of the address
        contained in pimInterfaceAddress. Legal values
        correspond to the subset of address families for which
        PIM routing is supported."
    ::= { pimInterfaceEntry 2 }

```

```

pimInterfaceAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current

```

DESCRIPTION

"The IP address of the PIM interface."

::= { pimInterfaceEntry 3 }

pimInterfaceNetMaskLen OBJECT-TYPE

SYNTAX INTEGER (0..128)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The length in bits of the network mask which when combined with the corresponding value of pimInterfaceAddress identifies the address of the

network

to which the PIM interface is attached."

::= { pimInterfaceEntry 4 }

pimInterfaceMode OBJECT-TYPE

SYNTAX INTEGER { dense(1), sparse(2), sparseDense(3) }

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The configured mode of this PIM interface. A value of sparseDense is only valid for PIMv1."

DEFVAL { dense }

::= { pimInterfaceEntry 5 }

pimInterfaceDRType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A value indicating the address family of the address contained in pimInterfaceDR. The value MUST be the same

as

the value of pimInterfaceAddressType."

::= { pimInterfaceEntry 6 }

pimInterfaceDR OBJECT-TYPE

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SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Designated Router on this PIM interface. For point-to-point interfaces, pimInterfaceDR will be

0.0.0.0

in the case of an IPv4 entry, and 0:0:0:0:0:0:0:0 in the

```

        case of an IPv6 entry."
 ::= { pimInterfaceEntry 7 }

pimInterfaceHelloInterval OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The frequency at which PIM Hello messages are
transmitted
        on this interface."
    DEFVAL      { 30 }
 ::= { pimInterfaceEntry 8 }

pimInterfaceStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The status of this entry.  Creating the entry enables
PIM
        on the interface; destroying the entry disables PIM on
the
        interface."
 ::= { pimInterfaceEntry 9 }

pimInterfaceJoinPruneInterval OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The frequency at which PIM Join/Prune messages are
transmitted on this PIM interface.  The default value of
this object is the pimJoinPruneInterval."
 ::= { pimInterfaceEntry 10 }

pimInterfaceCBSRPreference OBJECT-TYPE
    SYNTAX      Integer32 (-1..255)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The preference value for the local interface as a
candidate bootstrap router.  The value of -1 is used to

```



```

        interface."
    DEFVAL      { 0 }
    ::= { pimInterfaceEntry 11 }

-- The PIM Neighbor Table

pimNeighborTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimNeighborEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the router's PIM
        neighbors."
    ::= { pim 3 }

pimNeighborEntry OBJECT-TYPE
    SYNTAX      PimNeighborEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the pimNeighborTable."
    INDEX       { pimNeighborAddressType, pimNeighborAddress }
    ::= { pimNeighborTable 1 }

PimNeighborEntry ::= SEQUENCE {
    pimNeighborAddressType  InetAddressType,
    pimNeighborAddress      InetAddress,
    pimNeighborIfIndex      InterfaceIndex,
    pimNeighborUpTime       TimeTicks,
    pimNeighborExpiryTime   TimeTicks,
    pimNeighborMode          INTEGER
}

pimNeighborAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A value indicating the address family of the address
        contained in pimNeighborAddress.  Legal values
        correspond
        to the subset of
        address families for which PIM routing is supported."
    ::= { pimNeighborEntry 1 }

pimNeighborAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The IP address of the PIM neighbor for which this entry

```

contains information."

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```
 ::= { pingNeighborEntry 2 }

pingNeighborIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of ifIndex for the interface used to reach
this
        PIM neighbor."
 ::= { pingNeighborEntry 3 }

pingNeighborUpTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The time since this PIM neighbor (last) became a
neighbor
        of the local router."
 ::= { pingNeighborEntry 4 }

pingNeighborExpiryTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The minimum time remaining before this PIM neighbor
will
        be aged out."
 ::= { pingNeighborEntry 5 }

pingNeighborMode OBJECT-TYPE
    SYNTAX      INTEGER { dense(1), sparse(2) }
    MAX-ACCESS  read-only
    STATUS      deprecated
    DESCRIPTION
        "The active PIM mode of this neighbor. This object is
        deprecated for PIMv2 routers since all neighbors on the
        interface must be either dense or sparse as determined
by
        the protocol running on the interface."
 ::= { pingNeighborEntry 6 }

--
```

-- The PIM IP Multicast Route Table  
--

pimgInetMRouteTable OBJECT-TYPE  
SYNTAX SEQUENCE OF PimgInetMRouteEntry  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION

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"The (conceptual) table listing PIM-specific information  
on a subset of the rows of the inetMRouteTable defined  
in  
the Inet Multicast MIB."  
 ::= { pimg 4 }

pimgInetMRouteEntry OBJECT-TYPE  
SYNTAX PimgInetMRouteEntry  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"An entry (conceptual row) in the pimgInetMRouteTable.  
There is one entry per entry in the inetMRouteTable

whose  
incoming interface is running PIM."  
INDEX { inetMRouteGroupType,  
inetMRouteGroup,  
inetMRouteGroupMaskLen,  
inetMRouteSourceType,  
inetMRouteSource,  
inetMRouteSourceMaskLen }  
 ::= { pimgInetMRouteTable 1 }

PimgInetMRouteEntry ::= SEQUENCE {  
pimgInetMRouteUpstreamAssertTimer TimeTicks,  
pimgInetMRouteAssertMetric Integer32,  
pimgInetMRouteAssertMetricPref Integer32,  
pimgInetMRouteAssertRPTBit TruthValue,  
pimgInetMRouteFlags BITS  
}

pimgInetMRouteUpstreamAssertTimer OBJECT-TYPE  
SYNTAX TimeTicks  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The time remaining before the router changes its

upstream

neighbor back to its RPF neighbor. This timer is called the Assert timer in the PIM Sparse and Dense mode specification. A value of 0 indicates that no Assert has changed the upstream neighbor away from the RPF

neighbor."

::= { pimInetMRouteEntry 1 }

pimInetMRouteAssertMetric OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The metric advertised by the assert winner on the upstream interface, or 0 if no such assert is in

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received."

::= { pimInetMRouteEntry 2 }

pimInetMRouteAssertMetricPref OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The preference advertised by the assert winner on the upstream interface, or 0 if no such assert is in

effect."

::= { pimInetMRouteEntry 3 }

pimInetMRouteAssertRPTBit OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the RPT-bit advertised by the assert

winner

on the upstream interface, or false if no such assert is in effect."

::= { pimInetMRouteEntry 4 }

pimInetMRouteFlags OBJECT-TYPE

SYNTAX BITS {  
    rpt(0),  
    spt(1)  
}

MAX-ACCESS read-only

STATUS current

```

DESCRIPTION
    "This object describes PIM-specific flags related
    to a multicast state entry.  See the PIM Sparse
    Mode specification for the meaning of the RPT and
    SPT bits."
 ::= { pimInetMRouteEntry 5 }

--
-- The PIM Next Hop Table
--

pimInetMRouteNextHopTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimInetMRouteNextHopEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing PIM-specific
        information on a subset of the rows of the
        inetMRouteNextHopTable defined in the IP Multicast
        MIB."
    ::= { pim 7 }

```

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```

pimInetMRouteNextHopEntry OBJECT-TYPE
    SYNTAX      PimInetMRouteNextHopEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the
        pimInetMRouteNextHopTable. There is one entry per
        entry in the inetMRouteNextHopTable whose interface
        is running PIM and whose inetMRouteNextHopState is
        pruned(1)."
```

INDEX

```

    { inetMRouteNextHopGroupType,
      inetMRouteNextHopGroup,
      inetMRouteNextHopSourceType,
      inetMRouteNextHopSource,
      inetMRouteNextHopSourceMaskLen,
      inetMRouteNextHopIfIndex,
      inetMRouteNextHopAddressType,
      inetMRouteNextHopAddress }
 ::= { pimInetMRouteNextHopTable 1 }

PimInetMRouteNextHopEntry ::= SEQUENCE {
    pimInetMRouteNextHopPruneReason    INTEGER
}

```

```

pimInetMRouteNextHopPruneReason OBJECT-TYPE
    SYNTAX      INTEGER {
                        other (1),
                        prune (2),
                        assert (3)
                    }
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
        "This object indicates why the downstream interface
        was pruned, whether in response to a PIM prune
        message or due to PIM Assert processing."
    ::= { pimInetMRouteNextHopEntry 2 }

```

-- The PIM RP Table

```

pimRPTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimRPEntry
    MAX-ACCESS not-accessible
    STATUS      deprecated
    DESCRIPTION
        "The (conceptual) table listing PIM version 1
        information for the Rendezvous Points (RPs) for
        multicast groups. This table is deprecated since
        its function is replaced by the pimRPSetTable for
        PIM version 2."
    ::= { pim 5 }

```

```

pimRPEntry OBJECT-TYPE

```

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```

    SYNTAX      PimRPEntry
    MAX-ACCESS not-accessible
    STATUS      deprecated
    DESCRIPTION
        "An entry (conceptual row) in the pimRPTable.
        There is one entry per RP address for each
        multicast group."
    INDEX      { pimRPGroupAddressType, pimRPGroupAddress,
                pimRPAddressType, pimRPAddress }
    ::= { pimRPTable 1 }

```

```

PimRPEntry ::= SEQUENCE {
    pimRPGroupAddressType  InetAddressType,
    pimRPGroupAddress      InetAddress,
    pimRPAddressType       InetAddressType,
    pimRPAddress           InetAddress,
    pimRPState             INTEGER,

```

```

    pimGRPStateTimer          TimeTicks,
    pimGRPLastChange          TimeTicks,
    pimGRPRowStatus            RowStatus
}

pimGRPGroupAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
        "A value indicating the address family of the
        address contained in pimGRPGroupAddress. Legal
        values are:
        unknown(0), ipv4(1), ipv6(2), dns(16)"
    ::= { pimRPEntry 1 }

pimGRPGroupAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
        "The multicast group address for which this entry
        contains information about an RP."
    ::= { pimRPEntry 2 }

pimRPAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
        "A value indicating the address family of the
        address contained in pimRPAddress. The value MUST
        be the same as the value of
        pimGRPGroupAddressType."
    ::= { pimRPEntry 3 }

```

```

pimRPAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
        "The unicast address of the RP."
    ::= { pimRPEntry 4 }

pimRPState OBJECT-TYPE
    SYNTAX      INTEGER { up(1), down(2) }

```

MAX-ACCESS read-only  
 STATUS deprecated  
 DESCRIPTION  
     "The state of the RP."  
 ::= { pimGRPEntry 5 }

pimGRPStateTimer OBJECT-TYPE  
 SYNTAX TimeTicks  
 MAX-ACCESS read-only  
 STATUS deprecated  
 DESCRIPTION  
     "The minimum time remaining before the next state  
     change. When pimGRPState is up, this is the minimum  
     time which must expire until it can be declared  
     down. When pimGRPState is down, this is the time  
     until it will be declared up (in order to retry)."  
 ::= { pimGRPEntry 6 }

pimGRPLastChange OBJECT-TYPE  
 SYNTAX TimeTicks  
 MAX-ACCESS read-only  
 STATUS deprecated  
 DESCRIPTION  
     "The value of sysUpTime at the time when the  
     corresponding instance of pimGRPState last changed  
     its value."  
 ::= { pimGRPEntry 7 }

pimGRPRowStatus OBJECT-TYPE  
 SYNTAX RowStatus  
 MAX-ACCESS read-create  
 STATUS deprecated  
 DESCRIPTION  
     "The status of this row, by which new entries may  
     be created, or old entries deleted from this  
     table."  
 ::= { pimGRPEntry 8 }

-- The PIM RP-Set Table

pimRPSetTable OBJECT-TYPE  
 SYNTAX SEQUENCE OF PimRPSetEntry  
 MAX-ACCESS not-accessible

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STATUS current  
 DESCRIPTION  
     "The (conceptual) table listing PIM information for



candidate Rendezvous Points (RPs) for multicast groups. When the local router is the BSR, this information is obtained from received Candidate-RP-Advertisements. When the local router is not the BSR, this information is obtained from received RP-Set messages."

::= { pimg 6 }

pimgRPSetEntry OBJECT-TYPE

SYNTAX PimgRPSetEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) in the pimgRPSetTable."

INDEX { pimgRPSetComponent,  
pimgRPSetGroupAddressType,  
pimgRPSetGroupAddress,  
pimgRPSetGroupMaskLen, pimgRPSetAddressType,  
pimgRPSetAddress }

::= { pimgRPSetTable 1 }

PimgRPSetEntry ::= SEQUENCE {

pimgRPSetGroupAddressType InetAddressType,

pimgRPSetGroupAddress InetAddress,

pimgRPSetGroupMaskLen INTEGER,

pimgRPSetAddressType InetAddressType,

pimgRPSetAddress InetAddress,

pimgRPSetHoldTime Integer32,

pimgRPSetExpiryTime TimeTicks,

pimgRPSetComponent Integer32

}

pimgRPSetGroupAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A value indicating the address family of the address contained in pimgRPSetGroupAddress. Legal values correspond to the subset of address families for which

PIM

routing is supported."

::= { pimgRPSetEntry 1 }

pimgRPSetGroupAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP multicast group address which, when

combined with  
the value of pimgRPSetGroupMaskLen, gives the group  
prefix for which this entry contains information  
about the Candidate-RP."  
::= { pimgRPSetEntry 2 }

pimgRPSetGroupMaskLen OBJECT-TYPE

SYNTAX INTEGER (0..128)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The length in bits of the mask which, when  
combined with pimgRPSetGroupAddress, gives the  
group prefix for which this entry contains  
information about the Candidate-RP."

::= { pimgRPSetEntry 3 }

pimgRPSetAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A value indicating the address family of the  
address contained in pimgRPSetAddress. The value  
MUST be the same as the value of  
pimgRPSetGroupAddressType."

::= { pimgRPSetEntry 4 }

pimgRPSetAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address of the Candidate-RP."

::= { pimgRPSetEntry 5 }

pimgRPSetHoldTime OBJECT-TYPE

SYNTAX Integer32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The holdtime of a Candidate-RP. If the local  
router is not the BSR, this value is 0."

::= { pimgRPSetEntry 6 }

pimgRPSetExpiryTime OBJECT-TYPE

SYNTAX        TimeTicks  
 MAX-ACCESS read-only  
 STATUS        current  
 DESCRIPTION  
       "The minimum time remaining before the Candidate-RP  
       will be declared down. If the local router is not

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      the BSR, this value is 0."  
 ::= { pimRPSetEntry 7 }

pimRPSetComponent OBJECT-TYPE

SYNTAX        Integer32 (1..255)  
 MAX-ACCESS not-accessible  
 STATUS        current  
 DESCRIPTION  
       "A number uniquely identifying the component. Each  
       protocol instance connected to a separate domain  
       should have a different index value."  
 ::= { pimRPSetEntry 8 }

-- The PIM Candidate-RP Table

pimCandidateRPTTable OBJECT-TYPE

SYNTAX        SEQUENCE OF PimCandidateRPEntry  
 MAX-ACCESS not-accessible  
 STATUS        current  
 DESCRIPTION  
       "The (conceptual) table listing the multicast  
       groups for which the local router is to advertise  
       itself as a Candidate-RP when the value of  
       pimComponentCRPHoldTime is non-zero. If this  
       table is empty, then the local router  
       will advertise itself as a Candidate-RP for all  
       groups (providing the value of  
       pimComponentCRPHoldTime is non-zero)."  
 ::= { pim 11 }

pimCandidateRPEntry OBJECT-TYPE

SYNTAX        PimCandidateRPEntry  
 MAX-ACCESS not-accessible  
 STATUS        current  
 DESCRIPTION  
       "An entry (conceptual row) in the  
       pimCandidateRPTTable."  
 INDEX        { pimCandidateRPGroupAddressType,  
               pimCandidateRPGroupAddress,  
               pimCandidateRPGroupMaskLen }

::= { pimCandidateRPTable 1 }

PimCandidateRPEntry ::= SEQUENCE {  
    pimCandidateRPGroupAddressType InetAddressType,  
    pimCandidateRPGroupAddress     InetAddress,  
    pimCandidateRPGroupMaskLen     INTEGER,  
    pimCandidateRPAddressType     InetAddressType,  
    pimCandidateRPAddress          InetAddress,  
    pimCandidateRPRowStatus        RowStatus  
}

pimCandidateRPGroupAddressType OBJECT-TYPE  
    SYNTAX        InetAddressType

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MAX-ACCESS not-accessible

STATUS       current

DESCRIPTION

"A value indicating the address family of the  
address contained in pimCandidateRPGroupAddress.  
Legal values correspond to the subset of address  
families for which PIM routing is supported."

::= { pimCandidateRPEntry 1 }

pimCandidateRPGroupAddress OBJECT-TYPE

SYNTAX        InetAddress

MAX-ACCESS not-accessible

STATUS       current

DESCRIPTION

"The multicast group address which, when combined  
with the corresponding value of  
pimCandidateRPGroupMaskLen, identifies a group  
prefix for which the local router will advertise  
itself as a Candidate-RP."

::= { pimCandidateRPEntry 2 }

pimCandidateRPGroupMaskLen OBJECT-TYPE

SYNTAX        INTEGER (0..128)

MAX-ACCESS not-accessible

STATUS       current

DESCRIPTION

"The length in bits of the mask which, when  
combined with pimCandidateRPGroupAddress,  
identifies a group prefix for which the local  
router will advertise itself as a Candidate-RP."

::= { pimCandidateRPEntry 3 }

pimCandidateRPAddressType OBJECT-TYPE

SYNTAX        InetAddressType  
 MAX-ACCESS read-create  
 STATUS        current  
 DESCRIPTION  
       "A value indicating the address family of the  
       address contained in pimgCandidateRPAddress. The  
       value MUST be the same as the value of  
       pimgCandidateRPGroupAddressType."  
 ::= { pimgCandidateRPEntry 4 }

#### pimgCandidateRPAddress OBJECT-TYPE

SYNTAX        InetAddress  
 MAX-ACCESS read-create  
 STATUS        current  
 DESCRIPTION  
       "The (unicast) address of the interface which will  
       be advertised as a Candidate-RP."  
 ::= { pimgCandidateRPEntry 5 }

#### pimgCandidateRPRowStatus OBJECT-TYPE

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SYNTAX        RowStatus  
 MAX-ACCESS read-create  
 STATUS        current  
 DESCRIPTION  
       "The status of this row, by which new entries may  
       be created, or old entries deleted from this  
       table."  
 ::= { pimgCandidateRPEntry 6 }

#### -- The PIM Component Table

#### pimgComponentTable OBJECT-TYPE

SYNTAX        SEQUENCE OF PimgComponentEntry  
 MAX-ACCESS not-accessible  
 STATUS        current  
 DESCRIPTION  
       "The (conceptual) table containing objects specific  
       to a PIM domain. One row exists for each domain to  
       which the router is connected. A PIM-SM domain is  
       defined as an area of the network over which  
       Bootstrap messages are forwarded. Typically, a PIM-  
       SM router will be a member of exactly one domain.  
       This table also supports, however, routers which  
       may form a border between two PIM-SM domains and do  
       not forward Bootstrap messages between them."  
 ::= { pim 12 }

```

pimgComponentEntry OBJECT-TYPE
    SYNTAX      PimgComponentEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the
        pimgComponentTable."
    INDEX       { pimgComponentIndex }
    ::= { pimgComponentTable 1 }

```

```

PimgComponentEntry ::= SEQUENCE {
    pimgComponentIndex      Integer32,
    pimgComponentBSRAddressType  InetAddressType,
    pimgComponentBSRAddress    InetAddress,
    pimgComponentBSRExpiryTime  TimeTicks,
    pimgComponentCRPHoldTime    Integer32,
    pimgComponentStatus        RowStatus
}

```

```

pimgComponentIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..255)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying the component.  Each
        protocol instance connected to a separate domain

```

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```

        should have a different index value.  Routers that
        only support membership in a single PIM-SM domain
        should use a pimgComponentIndex value of 1."
    ::= { pimgComponentEntry 1 }

```

```

pimgComponentBSRAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A value indicating the address family of the
        address contained in pimgComponentBSRAddress.  Legal
        values correspond to the subset of address families
        for which PIM routing is supported."
    ::= { pimgComponentEntry 2 }

```

```

pimgComponentBSRAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only

```

```

STATUS      current
DESCRIPTION
    "The address of the bootstrap router (BSR) for the
    local PIM region."
::= { pimComponentEntry 3 }

```

```

pimComponentBSRExpiryTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The minimum time remaining before the bootstrap
        router in the local domain will be declared down.
        For candidate BSRs, this is the time until the
        component sends an RP-Set message. For other
        routers, this is the time until it may accept an
        RP-Set message from a lower candidate BSR."
    ::= { pimComponentEntry 4 }

```

```

pimComponentCRPHoldTime OBJECT-TYPE
    SYNTAX      Integer32 (0..255)
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The holdtime of the component when it is a
        candidate RP in the local domain. The value of 0
        is used to indicate that the local system is not a
        Candidate-RP."
    DEFVAL      { 0 }
    ::= { pimComponentEntry 5 }

```

```

pimComponentStatus OBJECT-TYPE
    SYNTAX      RowStatus

```

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```

MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of this entry. Creating the entry
    creates another protocol instance; destroying the
    entry disables a protocol instance."
    ::= { pimComponentEntry 6 }

```

-- PIM Traps

```

pimNeighborLoss NOTIFICATION-TYPE
    OBJECTS {

```

```

        pingNeighborIfIndex
    }
    STATUS          current
    DESCRIPTION
        "A pingNeighborLoss trap signifies the loss of an
        adjacency with a neighbor. This trap should be
        generated when the neighbor timer expires, and the
        router has no other neighbors on the same interface
        with a lower IP address than itself."
    ::= { pingTraps 1 }

-- conformance information

pingMIBConformance OBJECT IDENTIFIER ::= { pingMIB 2 }
pingMIBCompliances OBJECT IDENTIFIER ::= { pingMIBConformance 1 }
pingMIBGroups      OBJECT IDENTIFIER ::= { pingMIBConformance 2 }

-- compliance statements

pingV1MIBCompliance MODULE-COMPLIANCE
    STATUS deprecated
    DESCRIPTION
        "The compliance statement for routers running PIMv1
        and implementing the PIM MIB."
    MODULE -- this module
        MANDATORY-GROUPS { pingV1MIBGroup }

    ::= { pingMIBCompliances 1 }

pingSparseV2MIBCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for routers running PIM
        Sparse Mode and implementing the PIM MIB."
    MODULE -- this module
        MANDATORY-GROUPS { pingV2MIBGroup }

    GROUP pingV2CandidateRPMIBGroup
    DESCRIPTION
        "This group is mandatory if the router is capable
        of being a Candidate RP."

```

```

OBJECT      pingInterfaceStatus
MIN-ACCESS  read-only
DESCRIPTION
    "Write access is not required."

```



```

::= { pimMIBCompliances 2 }

pimDenseV2MIBCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for routers running PIM
        Dense Mode and implementing the PIM MIB."
    MODULE -- this module
    MANDATORY-GROUPS { pimDenseV2MIBGroup }

    OBJECT      pimInterfaceStatus
    MIN-ACCESS read-only
    DESCRIPTION
        "Write access is not required."

::= { pimMIBCompliances 3 }

-- units of conformance

pimNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS { pimNeighborLoss }
    STATUS current
    DESCRIPTION
        "A collection of notifications for signaling
        important PIM events."
::= { pimMIBGroups 1 }

pimV2MIBGroup OBJECT-GROUP
    OBJECTS { pimJoinPruneInterval, pimNeighborIfIndex,
        pimNeighborUpTime, pimNeighborExpiryTime,
        pimInterfaceAddressType, pimInterfaceAddress,
        pimInterfaceNetMaskLen,
        pimInterfaceDRType, pimInterfaceDR,
        pimInterfaceHelloInterval,
        pimInterfaceStatus,
        pimInterfaceJoinPruneInterval,
        pimInterfaceBSRPreference, pimInterfaceMode,
        pimRPSetHoldTime, pimRPSetExpiryTime,
        pimComponentBSRAddressType,
        pimComponentBSRAddress,
        pimComponentBSRExpiryTime,
        pimComponentCRPHoldTime, pimComponentStatus,
        pimInetMRouteFlags,
        pimInetMRouteUpstreamAssertTimer
    }
    STATUS current
    DESCRIPTION

```

"A collection of objects to support management of PIM  
Sparse

Mode (version 2) routers."  
::= { pimMIBGroups 2 }

pimDenseV2MIBGroup OBJECT-GROUP

OBJECTS { pimNeighborIfIndex,  
          pimNeighborUpTime, pimNeighborExpiryTime,  
          pimInterfaceAddressType, pimInterfaceAddress,  
          pimInterfaceNetMaskLen,  
          pimInterfaceDRType, pimInterfaceDR,  
          pimInterfaceHelloInterval,  
          pimInterfaceStatus, pimInterfaceMode  
          }

STATUS current

DESCRIPTION

"A collection of objects to support management of  
PIM Dense Mode (version 2) routers."

::= { pimMIBGroups 7 }

pimV2CandidateRPMIBGroup OBJECT-GROUP

OBJECTS { pimCandidateRPAddressType,  
          pimCandidateRPAddress,  
          pimCandidateRPRowStatus  
          }

STATUS current

DESCRIPTION

"A collection of objects to support configuration  
of which groups a router is to advertise itself as  
a Candidate-RP."

::= { pimMIBGroups 3 }

pimV1MIBGroup OBJECT-GROUP

OBJECTS { pimJoinPruneInterval, pimNeighborIfIndex,  
          pimNeighborUpTime, pimNeighborExpiryTime,  
          pimNeighborMode,  
          pimInterfaceAddressType, pimInterfaceAddress,  
          pimInterfaceNetMaskLen,  
          pimInterfaceJoinPruneInterval,  
          pimInterfaceStatus,  
          pimInterfaceMode,  
          pimInterfaceDRType, pimInterfaceDR,  
          pimInterfaceHelloInterval,  
          pimRPState, pimRPStateTimer,  
          pimRPLastChange, pimRPRowStatus  
          }

STATUS deprecated

DESCRIPTION

"A collection of objects to support management of

```
        PIM (version 1) routers."
 ::= { pimMIBGroups 4 }
```

```
pimNextHopGroup OBJECT-GROUP
```

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```
OBJECTS { pimInetMRouteNextHopPruneReason }
STATUS  current
DESCRIPTION
    "A collection of optional objects to provide per-
    next hop information for diagnostic purposes.
    Supporting this group may add a large number of
    instances to a tree walk, but the information in
    this group can be extremely useful in tracking down
    multicast connectivity problems."
 ::= { pimMIBGroups 5 }
```

```
pimAssertGroup OBJECT-GROUP
```

```
    OBJECTS { pimInetMRouteAssertMetric,
pimInetMRouteAssertMetricPref,
                pimInetMRouteAssertRPTBit }
STATUS  current
DESCRIPTION
    "A collection of optional objects to provide extra
    information about the assert election process.
    There is no protocol reason to keep such
    information, but some implementations may already
    keep this information and make it available. These
    objects can also be very useful in debugging
    connectivity or duplicate packet problems,
    especially if the assert winner does not support
    the PIM and Inet Multicast MIBs."
 ::= { pimMIBGroups 6 }
```

```
END
```

## 6. Security Considerations

This MIB contains readable objects whose values provide information related to multicast routing, including information on the network topology. There are also a number of objects that have a MAX-ACCESS clause of read-write and/or read-create, which allow an administrator to configure PIM in the router.

While unauthorized access to the readable objects is relatively innocuous, unauthorized access to the write-able objects could cause a denial of service. Hence, the support for SET operations in a non-secure environment without proper protection can have a negative

effect on network operations.

SNMPv1 by itself is such an insecure 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 SET (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 2274](#) [12] and the View-based Access Control Model [RFC 2275](#) [15] is recommended.

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It is then a customer/user responsibility to ensure that the SNMP entity giving access to this MIB, is properly configured to give access to those objects only to those principals (users) that have legitimate rights to access them.

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## [8.](#) Acknowledgements

This MIB module has been updated based on feedback from the IETF's

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