Protocol Independent Multicast MIB for IPv4

Status of this Memo

This memo defines an Experimental Protocol for the Internet community. It does not specify an Internet standard of any kind. Discussion and suggestions for improvement are requested. Distribution of this memo is unlimited.

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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 managing the Protocol Independent Multicast (PIM) protocol for IPv4.

Table of Contents

1 Introduction .................................................. 2
2 The SNMP Network Management Framework .................. 2
3 Overview .................................................... 3
4 Definitions .................................................. 4
5 Security Considerations .................................... 22
6 Intellectual Property Notice ................................ 23
7 Acknowledgements .......................................... 23
8 Authors’ Addresses ......................................... 24
9 References .................................................. 24
10 Full Copyright Statement .................................. 27
1. 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 [16,17,18,19]. This MIB module is applicable to IPv4 multicast routers which implement PIM. This MIB does not support management of PIM for other address families, including IPv6. Such management may be supported by other MIBs.

2. The SNMP Network Management Framework

The SNMP Management Framework presently consists of five major components:

- An overall architecture, described in RFC 2271 [1].

- 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 [2], STD 16, RFC 1212 [3] and RFC 1215 [4]. The second version, called SMIv2, is described in STD 58, RFC 2578 [5], STD 58, RFC 2579 [6] and STD 58, RFC 2580 [7].

- Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157 [8]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [9] and RFC 1906 [10]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [10], RFC 2572 [11] and RFC 2574 [12].

- Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [8]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [13].

- A set of fundamental applications described in RFC 2573 [14] and the view-based access control mechanism described in RFC 2575 [15].

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.

3. 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 [18,19].

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 which 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 IP multicast group addresses with particular address prefixes.
7. The PIM Candidate-RP Table contains the IP 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.
4. Definitions

PIM-MIB DEFINITIONS ::= BEGIN

IMPORTS
   MODULE-IDENTITY, OBJECT-TYPE, experimental,
   NOTIFICATION-TYPE,
   Integer32, IpAddress, TimeTicks FROM SNMPv2-SMI
   RowStatus, TruthValue FROM SNMPv2-TC
   MODULE-COMPLIANCE, OBJECT-GROUP,
   NOTIFICATION-GROUP FROM SNMPv2-CONF
   ipMRouteGroup, ipMRouteSource, ipMRouteSourceMask, ipMRouteNextHopGroup,
   ipMRouteNextHopSource, ipMRouteNextHopSourceMask, ipMRouteNextHopIfIndex,
   ipMRouteNextHopAddress FROM IPMROUTE-STD-MIB
   InterfaceIndex FROM IF-MIB;

pimMIB MODULE-IDENTITY
   LAST-UPDATED "200009280000Z" -- September 28, 2000
   ORGANIZATION "IETF IDMR Working Group."
   CONTACT-INFO
      " Dave Thaler
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       Redmond, WA  98052-6399
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   DESCRIPTION
      "The MIB module for management of PIM routers."
   REVISION     "200009280000Z" -- September 28, 2000
   DESCRIPTION
      "Initial version, published as RFC 2934."
   ::= { experimental 61 }

pimMIBObjects OBJECT IDENTIFIER ::= { pimMIB 1 }
pimTraps OBJECT IDENTIFIER ::= { pimMIBObjects 0 }
pim OBJECT IDENTIFIER ::= { pimMIBObjects 1 }
pimJoinPruneInterval OBJECT-TYPE
   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."
 ::= { pim 1 }

-- The PIM Interface Table

pimInterfaceTable OBJECT-TYPE
 SYNTAX     SEQUENCE OF PimInterfaceEntry
 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."
 ::= { pim 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,
   pimInterfaceAddress            IpAddress,
   pimInterfaceNetMask            IpAddress,
   pimInterfaceMode               INTEGER,
   pimInterfaceDR                 IpAddress,
   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 }

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

DESCRIPTION
"The IP address of the PIM interface."
::= { pimInterfaceEntry 2 }

pimInterfaceNetMask OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The network mask for the IP address of the PIM interface."
::= { pimInterfaceEntry 3 }

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 4 }

pimInterfaceDR OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The Designated Router on this PIM interface. For point-to-
point interfaces, this object has the value 0.0.0.0."
::= { pimInterfaceEntry 5 }

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 6 }

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 7 }

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 8 }

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 indicate that
  the local interface is not a candidate BSR interface."
DEFVAL     { 0 }
 ::= { pimInterfaceEntry 9 }

-- 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     { pimNeighborAddress }
 ::= { pimNeighborTable 1 }
PimNeighborEntry ::= SEQUENCE {
    pimNeighborAddress      IpAddress,
    pimNeighborIfIndex      InterfaceIndex,
    pimNeighborUpTime       TimeTicks,
    pimNeighborExpiryTime   TimeTicks,
    pimNeighborMode         INTEGER
}

pimNeighborAddress OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
   "The IP address of the PIM neighbor for which this entry
    contains information."
::= { pimNeighborEntry 1 }

pimNeighborIfIndex OBJECT-TYPE
SYNTAX InterfaceIndex
MAX-ACCESS read-only
STATUS current
DESCRIPTION
   "The value of ifIndex for the interface used to reach this
    PIM neighbor."
::= { pimNeighborEntry 2 }

pimNeighborUpTime 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."
::= { pimNeighborEntry 3 }

pimNeighborExpiryTime OBJECT-TYPE
SYNTAX TimeTicks
MAX-ACCESS read-only
STATUS current
DESCRIPTION
   "The minimum time remaining before this PIM neighbor will be
    aged out."
::= { pimNeighborEntry 4 }

pimNeighborMode 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."

::= { pimNeighborEntry 5 }

--
-- The PIM IP Multicast Route Table
--

pimIpMRouteTable OBJECT-TYPE
SYNTAX     SEQUENCE OF PimIpMRouteEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The (conceptual) table listing PIM-specific information on
a subset of the rows of the ipMRouteTable defined in the IP
Multicast MIB."

::= { pim 4 }

pimIpMRouteEntry OBJECT-TYPE
SYNTAX     PimIpMRouteEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"An entry (conceptual row) in the pimIpMRouteTable. There
is one entry per entry in the ipMRouteTable whose incoming
interface is running PIM."
INDEX      { ipMRouteGroup, ipMRouteSource, ipMRouteSourceMask }

::= { pimIpMRouteTable 1 }

PimIpMRouteEntry ::= SEQUENCE {
    pimIpMRouteUpstreamAssertTimer   TimeTicks,
    pimIpMRouteAssertMetric          Integer32,
    pimIpMRouteAssertMetricPref      Integer32,
    pimIpMRouteAssertRPTBit          TruthValue,
    pimIpMRouteFlags                 BITS
}

pimIpMRouteUpstreamAssertTimer 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.

::= {pimIpMRouteEntry 1}

pimIpMRouteAssertMetric 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 received."

::= {pimIpMRouteEntry 2}

pimIpMRouteAssertMetricPref 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."

::= {pimIpMRouteEntry 3}

pimIpMRouteAssertRPTBit 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."

::= {pimIpMRouteEntry 4}

pimIpMRouteFlags 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."

::= {pimIpMRouteEntry 5}

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

pimIpMRouteNextHopEntry OBJECT-TYPE
SYNTAX PimIpMRouteNextHopEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "An entry (conceptual row) in the pimIpMRouteNextHopTable. There is one entry per entry in the ipMRouteNextHopTable whose interface is running PIM and whose ipMRouteNextHopState is pruned(1)."
INDEX { ipMRouteNextHopGroup, ipMRouteNextHopSource, ipMRouteNextHopSourceMask, ipMRouteNextHopIfIndex, ipMRouteNextHopAddress }
::= { pimIpMRouteNextHopTable 1 }

PimIpMRouteNextHopEntry ::= SEQUENCE {
  pimIpMRouteNextHopPruneReason INTEGER
}

pimIpMRouteNextHopPruneReason 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."
::= { pimIpMRouteNextHopEntry 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 IP multicast groups.
This table is deprecated since its function is replaced by
the pimRPSetTable for PIM version 2."
::= { pim 5 }

pimRPEntry OBJECT-TYPE
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 IP multicast group."
INDEX      { pimRPGroupAddress, pimRPAddress }
::= { pimRPTable 1 }

PimRPEntry ::= SEQUENCE {
    pimRPGroupAddress    IpAddress,
    pimRPAddress         IpAddress,
    pimRPState           INTEGER,
    pimRPStateTimer      TimeTicks,
    pimRPLastChange      TimeTicks,
    pimRPRowStatus       RowStatus
}

pimRPGroupAddress OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     deprecated
DESCRIPTION
   "The IP multicast group address for which this entry
contains information about an RP."
::= { pimRPEntry 1 }

pimRPAddress OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     deprecated
DESCRIPTION
   "The unicast address of the RP."
::= { pimRPEntry 2 }

pimRPState OBJECT-TYPE
SYNTAX     INTEGER { up(1), down(2) }
MAX-ACCESS read-only
STATUS     deprecated
DESCRIPTION
"The state of the RP."
::= { pimRPEntry 3 }

pimRPStateTimer OBJECT-TYPE
SYNTAX     TimeTicks
MAX-ACCESS read-only
STATUS     deprecated
DESCRIPTION
"The minimum time remaining before the next state change. When pimRPState is up, this is the minimum time which must expire until it can be declared down. When pimRPState is down, this is the time until it will be declared up (in order to retry)."
::= { pimRPEntry 4 }

pimRPLastChange OBJECT-TYPE
SYNTAX     TimeTicks
MAX-ACCESS read-only
STATUS     deprecated
DESCRIPTION
"The value of sysUpTime at the time when the corresponding instance of pimRPState last changed its value."
::= { pimRPEntry 5 }

pimRPRowStatus 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."
::= { pimRPEntry 6 }

-- The PIM RP-Set Table

pimRPSetTable OBJECT-TYPE
SYNTAX     SEQUENCE OF PimRPSetEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The (conceptual) table listing PIM information for candidate Rendezvous Points (RPs) for IP 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."
::= { pim 6 }
pimRPSetEntry OBJECT-TYPE
SYNTAX     PimRPSetEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "An entry (conceptual row) in the pimRPSetTable."
INDEX      { pimRPSetComponent, pimRPSetGroupAddress,
                pimRPSetGroupMask, pimRPSetAddress }
 ::= { pimRPSetTable 1 }

PimRPSetEntry ::= SEQUENCE {
                  pimRPSetGroupAddress    IpAddress,
                  pimRPSetGroupMask       IpAddress,
                  pimRPSetAddress         IpAddress,
                  pimRPSetHoldTime        Integer32,
                  pimRPSetExpiryTime      TimeTicks,
                  pimRPSetComponent       Integer32
}

pimRPSetGroupAddress OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "The IP multicast group address which, when combined with
    pimRPSetGroupMask, gives the group prefix for which this
    entry contains information about the Candidate-RP."
 ::= { pimRPSetEntry 1 }

pimRPSetGroupMask OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "The multicast group address mask which, when combined with
    pimRPSetGroupAddress, gives the group prefix for which this
    entry contains information about the Candidate-RP."
 ::= { pimRPSetEntry 2 }

pimRPSetAddress OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "The IP address of the Candidate-RP."
 ::= { pimRPSetEntry 3 }
pimRPSetHoldTime 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."
 ::= { pimRPSetEntry 4 }

pimRPSetExpiryTime 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 the BSR, this value is 0."
 ::= { pimRPSetEntry 5 }

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 6 }

--
-- Note: { pim 8 } through { pim 10 } were used in older versions of this MIB. Since some earlier versions of this MIB have been widely-deployed, these values must not be used in the future, as long the MIB is rooted under { experimental 61 }.
--

-- The PIM Candidate-RP Table

pimCandidateRPTable OBJECT-TYPE
SYNTAX     SEQUENCE OF PimCandidateRPEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
 "The (conceptual) table listing the IP 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 pimCandidateRPTable."
INDEX      { pimCandidateRPGroupAddress, pimCandidateRPGroupMask }
::= { pimCandidateRPTable 1 }

PimCandidateRPEntry ::= SEQUENCE {
    pimCandidateRPGroupAddress    IpAddress,
    pimCandidateRPGroupMask       IpAddress,
    pimCandidateRPAddress         IpAddress,
    pimCandidateRPRowStatus       RowStatus
}

pimCandidateRPGroupAddress OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
    "The IP multicast group address which, when combined with 
pimCandidateRPGroupMask, identifies a group prefix for which 
the local router will advertise itself as a Candidate-RP."
::= { pimCandidateRPEntry 1 }

pimCandidateRPGroupMask OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
    "The multicast group address mask which, when combined with 
pimCandidateRPGroupMask, identifies a group prefix for which 
the local router will advertise itself as a Candidate-RP."
::= { pimCandidateRPEntry 2 }

pimCandidateRPAddress OBJECT-TYPE
SYNTAX     IpAddress
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
    "The (unicast) address of the interface which will be
RFC 2934  Protocol Independent Multicast MIB for IPv4  October 2000

advertised as a Candidate-RP."
 ::= { pimCandidateRPEntry 3 }

pimCandidateRPRowStatus OBJECT-TYPE
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."
 ::= { pimCandidateRPEntry 4 }

-- The PIM Component Table

pimComponentTable OBJECT-TYPE
SYNTAX     SEQUENCE OF PimComponentEntry
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."
 ::= { pimComponentTable 1 }

pimComponentEntry OBJECT-TYPE
SYNTAX     PimComponentEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"An entry (conceptual row) in the pimComponentTable."
INDEX      { pimComponentIndex }
 ::= { pimComponentTable 1 }

PimComponentEntry ::= SEQUENCE {
pimComponentIndex    Integer32,
pimComponentBSRAddress    IpAddress,
pimComponentBSRExpiryTime    TimeTicks,
pimComponentCRPHoldTime    Integer32,
pimComponentStatus        RowStatus
}

pimComponentIndex 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. Routers that only support membership in a single PIM-SM domain should use a pimComponentIndex value of 1."
::= { pimComponentEntry 1 }

pimComponentBSRAddress OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The IP address of the bootstrap router (BSR) for the local PIM region."
::= { pimComponentEntry 2 }

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 3 }

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 4 }

pimComponentStatus OBJECT-TYPE
SYNTAX RowStatus
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 5 }

-- PIM Traps

pimNeighborLoss NOTIFICATION-TYPE

OBJECTS {
    pimNeighborIfIndex
  }

STATUS current

DESCRIPTION
  "A pimNeighborLoss 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."

 ::= { pimTraps 1 }

-- conformance information

pimMIBConformance OBJECT IDENTIFIER ::= { pimMIB 2 }
pimMIBCompliances OBJECT IDENTIFIER ::= { pimMIBConformance 1 }
pimMIBGroups OBJECT IDENTIFIER ::= { pimMIBConformance 2 }

-- compliance statements

pimV1MIBCompliance MODULE-COMPLIANCE

STATUS deprecated

DESCRIPTION
  "The compliance statement for routers running PIMv1 and implementing the PIM MIB."

MODULE -- this module
  MANDATORY-GROUPS { pimV1MIBGroup }

 ::= { pimMIBCompliances 1 }

pimSparseV2MIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION
  "The compliance statement for routers running PIM Sparse Mode and implementing the PIM MIB."

MODULE -- this module
  MANDATORY-GROUPS { pimV2MIBGroup }

GROUP pimV2CandidateRPMIBGroup
DESCRIPTION
"This group is mandatory if the router is capable of being a
Candidate RP."

OBJECT     pimInterfaceStatus
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,
pimInterfaceAddress, pimInterfaceNetMask,
pimInterfaceDR, pimInterfaceHelloInterval,
pimInterfaceStatus, pimInterfaceJoinPruneInterval,
pimInterfaceCBSRPreference, pimInterfaceMode,
pimRPSetHoldTime, pimRPSetExpiryTime,
pimComponentBSRAddress, pimComponentBSRExpiryTime,
pimComponentCRPHoldTime, pimComponentStatus,
pimIpMRRouteFlags, pimIpMRouteUpstreamAssertTimer }
A collection of objects to support management of PIM Sparse Mode (version 2) routers.

::= { pimMIBGroups 2 }

pimDenseV2MIBGroup OBJECT-GROUP
OBJECTS { pimNeighborIfIndex,
    pimNeighborUpTime, pimNeighborExpiryTime,
    pimInterfaceAddress, pimInterfaceNetMask,
    pimInterfaceDR, pimInterfaceHelloInterval,
    pimInterfaceStatus, pimInterfaceMode
}
STATUS current
DESCRIPTION
    "A collection of objects to support management of PIM Dense Mode (version 2) routers."
::= { pimMIBGroups 5 }

pimV2CandidateRPGroup OBJECT-GROUP
OBJECTS { 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,
    pimInterfaceAddress, pimInterfaceNetMask,
    pimInterfaceJoinPruneInterval, pimInterfaceStatus,
    pimInterfaceMode, 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

McCloghrie, et al.  Experimental

[Page 21]
5. 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.

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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7. Acknowledgements

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9. References


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