

PIM WG  
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Protocol Independent Multicast MIB  
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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) protocols (PIM-SM and BIDIR-

Internet-Draft

PIM MIB

October 2005

PIM). This document is part of work in progress to obsolete [RFC 2934](#), and is to be preferred where the two documents overlap. This document does not obsolete [RFC 2934](#).

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">3</a>
<a href="#">2.</a>	The Internet-Standard Management Framework . . . . .	<a href="#">3</a>
<a href="#">3.</a>	Overview . . . . .	<a href="#">4</a>
<a href="#">4.</a>	Definitions . . . . .	<a href="#">5</a>
<a href="#">5.</a>	Security Considerations . . . . .	<a href="#">68</a>
<a href="#">6.</a>	IANA Considerations . . . . .	<a href="#">74</a>
<a href="#">7.</a>	Acknowledgements . . . . .	<a href="#">74</a>
<a href="#">8.</a>	References . . . . .	<a href="#">74</a>
<a href="#">8.1</a>	Normative References . . . . .	<a href="#">74</a>
<a href="#">8.2</a>	Informative References . . . . .	<a href="#">75</a>
	Authors' Addresses . . . . .	<a href="#">76</a>
	Intellectual Property and Copyright Statements . . . . .	<a href="#">77</a>

Internet-Draft

PIM MIB

October 2005

## 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) protocols (PIM-SM [[I-D.ietf-pim-sm-v2-new](#)] and BIDIR-PIM [[I-D.ietf-pim-bidir](#)]).

This document is part of work in progress to obsolete [RFC 2934](#) [[RFC2934](#)]. [RFC 2934](#) defined an experimental MIB module for managing the PIM protocols. The MIB module defined by this document is a re-working of the MIB module from [RFC 2934](#), with major changes that include the following.

- o This MIB module is independent of IP version, whereas [RFC 2934](#) only supported IPv4.
- o This MIB module includes support for managing BIDIR-PIM.
- o This MIB module does not include support for managing PIM-DM.
- o This MIB module does not include support for managing PIM-SM v1.
- o This MIB module does not depend on the IPv4 Multicast Routing MIB defined in [RFC 2932](#) [[RFC2932](#)].
- o This MIB module includes support for configuring static RPs.
- o This MIB module includes support for configuring anycast RPs [[I-D.ietf-pim-anycast-rp](#)]>.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

## 2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC 3410](#) [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [RFC 2578](#) [RFC2578], STD 58, [RFC 2579](#) [RFC2579] and STD 58, [RFC 2580](#)

[\[RFC2580\]](#).

### [3.](#) Overview

This MIB module contains the following tables.

1. The PIM Interface Table, which contains one row per IP version for each interface of the router which is running PIM.
2. The PIM Neighbor Table, which contains one row for each of the router's PIM neighbors.
3. The PIM Neighbor Secondary Address Table, which contains one row for each secondary address advertised by each of the router's PIM neighbors.
4. The PIM (\*,G) State Table, which contains one row for each group for which PIM has (\*,G) state.
5. The PIM (\*,G,I) State Table, which contains one row for each group and interface for which PIM has interface-specific (\*,G) state.
6. The PIM (S,G) State Table, which contains one row for each source and group for which PIM has (S,G) state.
7. The PIM (S,G,I) State Table, which contains one row for each source, group and interface for which PIM has interface-specific (S,G) state.

8. The PIM (S,G,rpt) State Table, which contains one row for each source and group for which PIM has (S,G,rpt) state.
9. The PIM (S,G,rpt,I) State Table, which contains one row for each source, group and interface for which PIM has interface-specific (S,G,rpt) state.
10. The PIM Bidir DF-Election Table, which contains one row per interface for each Rendezvous Point (RP) for which Bidirectional-PIM Designated Forwarder (DF) election state is maintained.
11. The PIM Static RP Table, which contains one row per range of multicast group addresses for which a particular configured RP should be used.
12. The PIM Group Mapping Table, which contains one row for each mapping from a multicast group address prefix to the PIM mode

and RP address to use for groups within that group prefix, regardless of the source of the group mapping information.

13. The PIM Anycast-RP Set Table, which contains one row for each RP within each Anycast-RP set of which the local router is a member.

This MIB module uses textual conventions defined in the IF-MIB [[RFC2863](#)], the INET-ADDRESS-MIB [[RFC4001](#)] and the IANA-RTPROTO-MIB.

#### [4.](#) Definitions

PIM-STD-MIB DEFINITIONS ::= BEGIN

##### IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, mib-2,  
NOTIFICATION-TYPE,  
Unsigned32, Gauge32, TimeTicks FROM SNMPv2-SMI  
TEXTUAL-CONVENTION,  
RowStatus, TruthValue FROM SNMPv2-TC  
MODULE-COMPLIANCE, OBJECT-GROUP,  
NOTIFICATION-GROUP FROM SNMPv2-CONF

```

InterfaceIndexOrZero,
InterfaceIndex          FROM IF-MIB
InetAddressType,
InetAddressPrefixLength,
InetAddress, InetVersion FROM INET-ADDRESS-MIB
IANAipRouteProtocol    FROM IANA-RTPROTO-MIB;

```

#### pimStdMIB MODULE-IDENTITY

LAST-UPDATED "200510040000Z" -- 4 October 2005

ORGANIZATION "IETF PIM Working Group"

CONTACT-INFO

"Email: pim@ietf.org"

DESCRIPTION

"The MIB module for management of PIM routers.

Copyright (C) The Internet Society (2005). This version of this MIB module is part of RFC yyyy; see the RFC itself for full legal notices."

-- RFC Ed.: replace yyyy with actual RFC number & remove this note

REVISION "200510040000Z" -- 4 October 2005

DESCRIPTION "Initial version, published as RFC yyyy."

-- RFC Ed.: replace yyyy with actual RFC number & remove this note

::= { mib-2 XXX }

-- RFC Ed.: replace XXX with IANA-assigned number & remove this note

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Sivaramu, et al.

Expires April 7, 2006

[Page 5]

Internet-Draft

PIM MIB

October 2005

-- Textual Conventions

--

PimMode ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The PIM mode in which a group is operating.

none(1) The group is not using PIM, which may be the case if, for example, it is a link-local or unroutable group address.

ssm(2) Source-Specific Multicast (SSM) with PIM Sparse Mode.

asm(3) Any Source Multicast (ASM), with PIM Sparse Mode.

bidir(4) Bi-directional PIM.

dm(5) PIM Dense Mode.

other(6) Any other PIM mode."

SYNTAX INTEGER {  
     none(1),  
     ssm(2),  
     asm(3),  
     bidir(4),  
     dm(5),  
     other(6)  
 }

PimGroupMappingOriginType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The mechanism by which a PIM group mapping was learned.

fixed(1) Link-local or unroutable group mappings.

configRp(2) Local static RP configuration.

configSsm(3) Local SSM Group configuration.

bsr(4) The PIM Bootstrap Router (BSR) mechanism.

autoRP(5) Cisco's Auto-RP mechanism.

embedded(6) The Embedded-RP mechanism where the RP address is embedded in the multicast group address.

other(7) Any other mechanism."

REFERENCE "[RFC 3956](#), I-D.ietf-pim-sm-bsr"

SYNTAX INTEGER {  
     fixed(1),

```

        configRp(2),
        configSsm(3),
        bsr(4),
        autoRP(5),
        embedded(6),
        other(7)
    }

--
-- Top-level structure
--

pimMIBObjects OBJECT IDENTIFIER ::= { pimStdMIB 1 }
pimTraps      OBJECT IDENTIFIER ::= { pimMIBObjects 0 }
pim           OBJECT IDENTIFIER ::= { pimMIBObjects 1 }

pimKeepalivePeriod OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The duration of the Keepalive Timer. This is the period
        during which the PIM router will maintain (S,G) state in the
        absence of explicit (S,G) local membership or (S,G) join
        messages received to maintain it. This timer period is
        called the Keepalive_Period in the PIM-SM specification."
    REFERENCE   "I-D.ietf-pim-sm-v2-new section 4.11"
    DEFVAL      { 210 }
    ::= { pim 14 }

pimRegisterSuppressionTime OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The duration of the Register Suppression Timer. This is
        the period during which a PIM Designated Router (DR) stops
        sending Register-encapsulated data to the Rendezvous Point

```

(RP) after receiving a Register-Stop message. This object

is used to run timers both at the DR and at the RP. This timer period is called the Register\_Suppression\_Time in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.11](#)"

DEFVAL { 60 }

::= { pim 15 }

pimStarGEntries OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries in the pimStarGTable."

::= { pim 16 }

pimStarGIEntries OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries in the pimStarGITable."

::= { pim 17 }

pimSGEntries OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries in the pimSGTable."

::= { pim 18 }

pimSGIEntries OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries in the pimSGITable."

::= { pim 19 }

pimSGRptEntries OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries in the pimSGRptTable."

::= { pim 20 }

pimSGRptIEntries OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries in the pimSGRptITable."

::= { pim 21 }

--

-- 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.

PIM is enabled on all interfaces listed in this table."

::= { pim 1 }

pimInterfaceEntry OBJECT-TYPE

SYNTAX PimInterfaceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) in the pimInterfaceTable. This entry is preserved on agent restart."

INDEX { pimInterfaceIfIndex,  
pimInterfaceIPVersion }

::= { pimInterfaceTable 1 }

PimInterfaceEntry ::= SEQUENCE {

pimInterfaceIfIndex	InterfaceIndex,
pimInterfaceIPVersion	InetVersion,
pimInterfaceAddressType	InetAddressType,
pimInterfaceAddress	InetAddress,
pimInterfaceDR	InetAddress,
pimInterfaceHelloInterval	Unsigned32,
pimInterfaceTrigHelloInterval	Unsigned32,
pimInterfaceJoinPruneInterval	Unsigned32,
pimInterfaceDFElectionRobustness	Unsigned32,
pimInterfaceHelloHoldtime	Unsigned32,
pimInterfaceJoinPruneHoldtime	Unsigned32,
pimInterfacePropagationDelay	Unsigned32,
pimInterfaceOverrideInterval	Unsigned32,

pimInterfaceGenerationIDValue	Unsigned32,
pimInterfaceDRPriority	Unsigned32,

Internet-Draft

PIM MIB

October 2005

pimInterfaceLanDelayEnabled	TruthValue,
pimInterfaceEffectPropagDelay	Unsigned32,
pimInterfaceEffectOverrideIvl	Unsigned32,
pimInterfaceSuppressionEnabled	TruthValue,
pimInterfaceBidirCapable	TruthValue,
pimInterfaceDRPriorityEnabled	TruthValue,
pimInterfaceDomainBorder	TruthValue,
pimInterfaceStatus	RowStatus,
pimInterfaceStubInterface	TruthValue

}

pimInterfaceIfIndex OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The ifIndex value of this PIM interface."

::= { pimInterfaceEntry 1 }

pimInterfaceIPVersion OBJECT-TYPE

SYNTAX InetVersion

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP version of this PIM interface. A physical interface may be configured in multiple modes concurrently, e.g. IPv4 and IPv6, however the traffic is considered to be logically separate."

::= { pimInterfaceEntry 2 }

pimInterfaceAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type of this PIM interface."

::= { pimInterfaceEntry 3 }

pimInterfaceAddress OBJECT-TYPE

```

SYNTAX      InetAddress (SIZE (4|8|16|20))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The primary IP address of this router on this PIM
    interface. The InetAddressType is given by the
    pimInterfaceAddressType object."
::= { pimInterfaceEntry 4 }

```

```

pimInterfaceDR OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (4|8|16|20))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The primary IP address of the Designated Router on this PIM
        interface. The InetAddressType is given by the
        pimInterfaceAddressType object."
    ::= { pimInterfaceEntry 5 }

```

```

pimInterfaceHelloInterval OBJECT-TYPE
    SYNTAX      Unsigned32 (0..18000)
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The frequency at which PIM Hello messages are transmitted
        on this interface. This object corresponds to the
        'Hello_Period' timer value defined in the PIM-SM
        specification. A value of zero represents an 'infinite'
        interval, and indicates that periodic PIM Hello messages
        should not be sent on this interface."
    REFERENCE  "I-D.ietf-pim-sm-v2-new section 4.11"
    DEFVAL     { 30 }
    ::= { pimInterfaceEntry 6 }

```

```

pimInterfaceTrigHelloInterval OBJECT-TYPE
    SYNTAX      Unsigned32 (0..60)
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION

```

"The maximum time before this router sends a triggered PIM Hello message on this interface. This object corresponds to the 'Trigered\_Hello\_Delay' timer value defined in the PIM-SM specification. A value of zero has no special meaning and indicates that triggered PIM Hello messages should always be sent immediately."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.11](#)"

DEFVAL { 5 }

::= { pimInterfaceEntry 7 }

pimInterfaceJoinPruneInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..18000)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

Sivaramu, et al.

Expires April 7, 2006

[Page 11]

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Internet-Draft

PIM MIB

October 2005

"The frequency at which this router sends PIM Join/Prune messages on this PIM interface. This object corresponds to the 't\_periodic' timer value defined in the PIM-SM specification. A value of zero represents an 'infinite' interval, and indicates that periodic PIM Join/Prune messages should not be sent on this interface."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.11](#)"

DEFVAL { 60 }

::= { pimInterfaceEntry 8 }

pimInterfaceDFElectionRobustness OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The minimum number of PIM DF-Election messages that must be lost in order for DF election on this interface to fail."

DEFVAL { 3 }

::= { pimInterfaceEntry 9 }

pimInterfaceHelloHolddtime OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

#### DESCRIPTION

"The value set in the Holdtime field of PIM Hello messages transmitted on this interface. A value of 65535 represents an 'infinite' holdtime. Implementations are recommended to use a holdtime that is 3.5 times the value of pimInterfaceHelloInterval, or 65535 if pimInterfaceHelloInterval is set to zero."

DEFVAL { 105 }

::= { pimInterfaceEntry 10 }

#### pimInterfaceJoinPruneHoldtime OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

#### DESCRIPTION

"The value inserted into the Holdtime field of a PIM Join/Prune message sent on this interface. A value of 65535 represents an 'infinite' holdtime. Implementations are recommended to use a holdtime that is 3.5 times the value of pimInterfaceJoinPruneInterval, or 65535 if pimInterfaceJoinPruneInterval is set to zero."

DEFVAL { 210 }

::= { pimInterfaceEntry 11 }

#### pimInterfacePropagationDelay OBJECT-TYPE

SYNTAX Unsigned32 (0..32767)

UNITS "milliseconds"

MAX-ACCESS read-create

STATUS current

#### DESCRIPTION

"The expected propagation delay between PIM routers on this network or link.

This router inserts this value into the Propagation\_Delay field of the LAN Prune Delay option in the PIM Hello messages sent on this interface. Implementations should enforce a lower bound on the permitted values for this object to allow for scheduling and processing delays within the local router."

DEFVAL { 500 }

```
::= { pimInterfaceEntry 12 }
```

pimInterfaceOverrideInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "milliseconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value this router inserts into the Override\_Interval field of the LAN Prune Delay option in the PIM Hello messages it sends on this interface.

When overriding a prune, PIM routers pick a random timer duration up to the value of this object. The more PIM routers that are active on a network, the more likely it is that the prune will be overridden after a small proportion of this time has elapsed.

The more PIM routers are active on this network, the larger this object should be to obtain an optimal spread of prune override latencies."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.3.3](#)"

DEFVAL { 2500 }

```
::= { pimInterfaceEntry 13 }
```

pimInterfaceGenerationIDValue OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the Generation ID this router inserted in the last PIM Hello message it sent on this interface."

```
::= { pimInterfaceEntry 14 }
```

pimInterfaceDRPriority OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Designated Router Priority value inserted into the DR Priority option on this interface. Numerically higher

values for this object indicate higher priorities."  
DEFVAL { 1 }  
::= { pimInterfaceEntry 15 }

pimInterfaceLanDelayEnabled OBJECT-TYPE

SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Evaluates to TRUE if all routers on this interface are  
using the LAN Prune Delay option."  
::= { pimInterfaceEntry 16 }

pimInterfaceEffectPropagDelay OBJECT-TYPE

SYNTAX Unsigned32 (0..32767)  
UNITS "milliseconds"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The Effective Propagation Delay on this interface. This  
object is always 500 if pimInterfaceLanDelayEnabled is  
FALSE."  
::= { pimInterfaceEntry 17 }

pimInterfaceEffectOverrideIvl OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)  
UNITS "milliseconds"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The Effective Override Interval on this interface. This  
object is always 2500 if pimInterfaceLanDelayEnabled is  
FALSE."  
::= { pimInterfaceEntry 18 }

pimInterfaceSuppressionEnabled OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"Whether join suppression is enabled on this interface.

This object is always TRUE if pimInterfaceLanDelayEnabled is  
        FALSE."  
::= { pimInterfaceEntry 19 }

pimInterfaceBidirCapable OBJECT-TYPE

SYNTAX        TruthValue  
MAX-ACCESS    read-only  
STATUS        current  
DESCRIPTION  
        "Evaluates to TRUE if all routers on this interface are  
        using the Bidirectional-PIM Capable option."  
::= { pimInterfaceEntry 20 }

pimInterfaceDRPriorityEnabled OBJECT-TYPE

SYNTAX        TruthValue  
MAX-ACCESS    read-only  
STATUS        current  
DESCRIPTION  
        "Evaluates to TRUE if all routers on this interface are  
        using the DR Priority option."  
::= { pimInterfaceEntry 21 }

pimInterfaceDomainBorder OBJECT-TYPE

SYNTAX        TruthValue  
MAX-ACCESS    read-create  
STATUS        current  
DESCRIPTION  
        "Whether or not this interface is a PIM domain border. This  
        includes acting as a border for PIM Bootstrap Router (BSR)  
        messages, if the BSR mechanism is in use."  
DEFVAL { false }  
::= { pimInterfaceEntry 22 }

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.  
  
        This status object can be set to active(1) without setting  
        any other columnar objects in this entry.

All writeable objects in this entry can be modified when the status of this entry is active(1)."  
 ::= { pimInterfaceEntry 23 }

pimInterfaceStubInterface OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Whether this interface is a 'stub interface'. If this object is set to TRUE, then no PIM packets are sent out this interface, and any received PIM packets are ignored.

Setting this object to TRUE is a security measure for interfaces towards untrusted hosts. This allows an interface to be configured for use with IGMP or MGMTD, while also protecting the PIM router from forged PIM messages on the interface.

To communicate with other PIM routers using this interface, this object must remain set to FALSE.

Changing the value of this object while the interface is operational causes the interface to be deactivated and then reactivated."

DEFVAL { false }

::= { pimInterfaceEntry 24 }

--

-- 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 2 }

pimNeighborEntry OBJECT-TYPE

SYNTAX PimNeighborEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

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

INDEX { pimNeighborIfIndex,

```

        pimNeighborAddress }
 ::= { pimNeighborTable 1 }

```

```

PimNeighborEntry ::= SEQUENCE {
    pimNeighborIfIndex      InterfaceIndex,
    pimNeighborAddressType  InetAddressType,
    pimNeighborAddress      InetAddress,
    pimNeighborUpTime       TimeTicks,
    pimNeighborExpiryTime   TimeTicks,
    pimNeighborLanPruneDelayPresent TruthValue,
    pimNeighborPropagationDelay Unsigned32,
    pimNeighborOverrideInterval Unsigned32,
    pimNeighborTBit         TruthValue,
    pimNeighborGenerationIDPresent TruthValue,
    pimNeighborGenerationIDValue Unsigned32,
    pimNeighborBidirCapable  TruthValue,
    pimNeighborDRPriorityPresent TruthValue,
    pimNeighborDRPriority    Unsigned32
}

```

```

pimNeighborIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The value of ifIndex for the interface used to reach this
        PIM neighbor."
    ::= { pimNeighborEntry 1 }

```

```

pimNeighborAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of this PIM neighbor."
    ::= { pimNeighborEntry 2 }

```

```

pimNeighborAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (4|8|16|20))
    MAX-ACCESS  not-accessible

```

STATUS current  
DESCRIPTION  
    "The primary IP address of this PIM neighbor. The  
    InetAddressType is given by the pimNeighborAddressType  
    object."  
::= { pimNeighborEntry 3 }

pimNeighborUpTime OBJECT-TYPE

Sivaramu, et al.

Expires April 7, 2006

[Page 17]

---

Internet-Draft

PIM MIB

October 2005

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

pimNeighborExpiryTime OBJECT-TYPE

SYNTAX TimeTicks  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The minimum time remaining before this PIM neighbor will  
    be aged out. The value zero indicates that this PIM  
    neighbor will never be aged out."  
::= { pimNeighborEntry 5 }

pimNeighborLanPruneDelayPresent OBJECT-TYPE

SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "Evaluates to TRUE if this neighbor is using the LAN Prune  
    Delay option."  
::= { pimNeighborEntry 6 }

pimNeighborPropagationDelay OBJECT-TYPE

SYNTAX Unsigned32 (0..32767)  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The value of the Propagation\_Delay field of the LAN Prune

Delay option received from this neighbor. This object is always zero if pimNeighborLanPruneDelayPresent is FALSE."  
 ::= { pimNeighborEntry 7 }

pimNeighborOverrideInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the Override\_Interval field of the LAN Prune Delay option received from this neighbor. This object is always zero if pimNeighborLanPruneDelayPresent is FALSE."

::= { pimNeighborEntry 8 }

pimNeighborTBit OBJECT-TYPE

Sivaramu, et al.

Expires April 7, 2006

[Page 18]

---

Internet-Draft

PIM MIB

October 2005

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the T bit was set in the LAN Prune Delay option received from this neighbor. The T bit specifies the ability of the neighbor to disable join suppression. This object is always TRUE if pimNeighborLanPruneDelayPresent is FALSE."

::= { pimNeighborEntry 9 }

pimNeighborGenerationIDPresent OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Evaluates to TRUE if this neighbor is using the Generation ID option."

::= { pimNeighborEntry 10 }

pimNeighborGenerationIDValue OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the Generation ID from the last PIM Hello

message received from this neighbor. This object is always zero if pimNeighborGenerationIDPresent is FALSE."  
 ::= { pimNeighborEntry 11 }

pimNeighborBidirCapable OBJECT-TYPE

SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
 "Evaluates to TRUE if this neighbor is using the  
 Bidirectional-PIM Capable option."  
 ::= { pimNeighborEntry 12 }

pimNeighborDRPriorityPresent OBJECT-TYPE

SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
 "Evaluates to TRUE if this neighbor is using the DR Priority  
 option."  
 ::= { pimNeighborEntry 13 }

pimNeighborDRPriority OBJECT-TYPE

SYNTAX Unsigned32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
 "The value of the Designated Router Priority from the last  
 PIM Hello message received from this neighbor. This object  
 is always zero if pimNeighborDRPriorityPresent is FALSE."  
 ::= { pimNeighborEntry 14 }

--  
-- The PIM Neighbor Secondary Address Table  
--

pimNbrSecAddressTable OBJECT-TYPE

SYNTAX SEQUENCE OF PimNbrSecAddressEntry  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION

"The (conceptual) table listing the secondary addresses advertised by each PIM neighbor (on a subset of the rows of the pimNeighborTable defined above)."  
 ::= { pim 3 }

pimNbrSecAddressEntry OBJECT-TYPE  
SYNTAX PimNbrSecAddressEntry  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"An entry (conceptual row) in the pimNbrSecAddressTable."  
INDEX { pimNbrSecAddressIfIndex,  
pimNbrSecAddressType,  
pimNbrSecAddressPrimary,  
pimNbrSecAddress }  
 ::= { pimNbrSecAddressTable 1 }

PimNbrSecAddressEntry ::= SEQUENCE {  
pimNbrSecAddressIfIndex InterfaceIndex,  
pimNbrSecAddressType InetAddressType,  
pimNbrSecAddressPrimary InetAddress,  
pimNbrSecAddress InetAddress  
}

pimNbrSecAddressIfIndex OBJECT-TYPE  
SYNTAX InterfaceIndex  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION

"The value of ifIndex for the interface used to reach this PIM neighbor."  
 ::= { pimNbrSecAddressEntry 1 }

pimNbrSecAddressType OBJECT-TYPE  
SYNTAX InetAddressType  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"The address type of this PIM neighbor."  
 ::= { pimNbrSecAddressEntry 2 }

```

pimNbrSecAddressPrimary OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (4|8|16|20))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The primary IP address of this PIM neighbor.  The
        InetAddressType is given by the pimNbrSecAddressType
        object."
    ::= { pimNbrSecAddressEntry 3 }

pimNbrSecAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (4|8|16|20))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The secondary IP address of this PIM neighbor.  The
        InetAddressType is given by the pimNbrSecAddressType
        object."
    ::= { pimNbrSecAddressEntry 4 }

--
-- The PIM (*,G) State Table
--

pimStarGTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimStarGEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the non-interface specific
        (*,G) state that PIM has."
    ::= { pim 4 }

pimStarGEntry OBJECT-TYPE
    SYNTAX      PimStarGEntry
    MAX-ACCESS  not-accessible

```

```

    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the pimStarGTable."
    INDEX      { pimStarGAddressType,
                pimStarGGrpAddress }

```

::= { pimStarGTable 1 }

```
PimStarGEntry ::= SEQUENCE {
    pimStarGAddressType      InetAddressType,
    pimStarGGrpAddress       InetAddress,
    pimStarGUpTime           TimeTicks,
    pimStarGPimMode          PimMode,
    pimStarGRPAddressType    InetAddressType,
    pimStarGRPAddress        InetAddress,
    pimStarGPimModeOrigin    PimGroupMappingOriginType,
    pimStarGRPIsLocal        TruthValue,
    pimStarGUpstreamJoinState INTEGER,
    pimStarGUpstreamJoinTimer TimeTicks,
    pimStarGUpstreamNeighbor InetAddressType,
    pimStarGUpstreamNeighbor InetAddress,
    pimStarGRPFIIfIndex      InterfaceIndexOrZero,
    pimStarGRPFPNextHopType  InetAddressType,
    pimStarGRPFPNextHop      InetAddress,
    pimStarGRPFPRouteProtocol IANAipRouteProtocol,
    pimStarGRPFPRouteAddress InetAddress,
    pimStarGRPFPRoutePrefixLength InetAddressPrefixLength,
    pimStarGRPFPRouteMetricPref Unsigned32,
    pimStarGRPFPRouteMetric  Unsigned32
}
```

```
pimStarGAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of this multicast group."
    ::= { pimStarGEntry 1 }
```

```
pimStarGGrpAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (4|8|16|20))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The multicast group address. The InetAddressType is given
        by the pimStarGAddressType object."
    ::= { pimStarGEntry 2 }
```

```
pimStarGUpTime OBJECT-TYPE
```

SYNTAX        TimeTicks  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION  
              "The time since this entry was created by the local router."  
::= { pimStarGEntry 3 }

pimStarGPimMode OBJECT-TYPE

SYNTAX        PimMode { asm(3), bidir(4) }  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION  
              "Whether this entry represents an ASM (Any Source Multicast,  
              used with PIM-SM) or BIDIR-PIM group."  
::= { pimStarGEntry 4 }

pimStarGRPAddressType OBJECT-TYPE

SYNTAX        InetAddressType  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION  
              "The address type of the Rendezvous Point (RP), or  
              unknown(0) if the RP address is unknown."  
::= { pimStarGEntry 5 }

pimStarGRPAddress OBJECT-TYPE

SYNTAX        InetAddress (SIZE (0|4|16|20))  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION  
              "The address of the Rendezvous Point (RP) for the group.  
              The InetAddressType is given by the pimStarGRPAddressType."  
::= { pimStarGEntry 6 }

pimStarGPimModeOrigin OBJECT-TYPE

SYNTAX        PimGroupMappingOriginType  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION  
              "The mechanism by which the PIM mode and RP for the group  
              were learned."  
::= { pimStarGEntry 7 }

pimStarGRPIsLocal OBJECT-TYPE

SYNTAX        TruthValue  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION

Internet-Draft

PIM MIB

October 2005

"Whether the local router is the RP for the group."  
 ::= { pimStarGEntry 8 }

pimStarGUpstreamJoinState OBJECT-TYPE

SYNTAX INTEGER {  
 notJoined (1),  
 joined (2)  
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the local router should join the RP tree for the group. This corresponds to the state of the upstream (\*,G) state machine in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.6](#)"

::= { pimStarGEntry 9 }

pimStarGUpstreamJoinTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining before the local router next sends a periodic (\*,G) Join message on pimStarGRPFIfIndex. This timer is called the (\*,G) Upstream Join Timer in the PIM-SM specification. This object is zero if the timer is not running."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.10](#)"

::= { pimStarGEntry 10 }

pimStarGUpstreamNeighborType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary address type of the upstream neighbor, or unknown(0) if the upstream neighbor address is unknown or is not a PIM neighbor."

::= { pimStarGEntry 11 }

pimStarGUpstreamNeighbor OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|16|20))

MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The primary address of the neighbor on pimStarGRPFIIfIndex that the local router is sending periodic (\*,G) Join messages to. The InetAddressType is given by the

pimStarGUpstreamNeighborType object. This address is called RPF'(\*,G) in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.1.6](#)"

::= { pimStarGEntry 12 }

pimStarGRPFIIfIndex OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of ifIndex for the RPF interface towards the RP, or zero if the RPF interface is unknown."

::= { pimStarGEntry 13 }

pimStarGRPFPNextHopType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type of the RPF next hop towards the RP, or unknown(0) if the RPF next hop is unknown."

::= { pimStarGEntry 14 }

pimStarGRPFPNextHop OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|16|20))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address of the RPF next hop towards the RP. The InetAddressType is given by the pimStarGRPFPNextHopType object. This address is called MRIB.next\_hop(RP(G)) in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.5](#)"

::= { pimStarGEntry 15 }

pimStarGRPFRouteProtocol OBJECT-TYPE

SYNTAX IANAipRouteProtocol

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The routing mechanism via which the route used to find the RPF interface towards the RP was learned."

::= { pimStarGEntry 16 }

pimStarGRPFRouteAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|16|20))

MAX-ACCESS read-only

STATUS current

Sivaramu, et al.

Expires April 7, 2006

[Page 25]

---

Internet-Draft

PIM MIB

October 2005

DESCRIPTION

"The IP address which when combined with the corresponding value of pimStarGRPFRoutePrefixLength identifies the route used to find the RPF interface towards the RP. The InetAddressType is given by the pimStarGRPFRNextHopType object.

This address object is only significant up to pimStarGRPFRoutePrefixLength bits. The remainder of the address bits are zero."

::= { pimStarGEntry 17 }

pimStarGRPFRoutePrefixLength OBJECT-TYPE

SYNTAX InetAddressPrefixLength

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The prefix length which when combined with the corresponding value of pimStarGRPFRouteAddress identifies the route used to find the RPF interface towards the RP. The InetAddressType is given by the pimStarGRPFRNextHopType object."

::= { pimStarGEntry 18 }

pimStarGRPFRouteMetricPref OBJECT-TYPE

SYNTAX Unsigned32 (0..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The metric preference of the route used to find the RPF interface towards the RP."

::= { pimStarGEntry 19 }

pimStarGRPFRouteMetric OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The routing metric of the route used to find the RPF interface towards the RP."

::= { pimStarGEntry 20 }

--

-- The PIM (\*,G,I) State Table

--

pimStarGITable OBJECT-TYPE

SYNTAX SEQUENCE OF PimStarGIEntry

Sivaramu, et al.

Expires April 7, 2006

[Page 26]

---

Internet-Draft

PIM MIB

October 2005

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The (conceptual) table listing the interface-specific (\*,G) state that PIM has."

::= { pim 5 }

pimStarGIEntry OBJECT-TYPE

SYNTAX PimStarGIEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

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

INDEX { pimStarGAddressType,  
pimStarGGrpAddress,  
pimStarGIIfIndex }

::= { pimStarGITable 1 }

PimStarGIEntry ::= SEQUENCE {

pimStarGIIfIndex

InterfaceIndex,

pimStarGIUpTime

TimeTicks,

```

    pimStarGILocalMembership      TruthValue,
    pimStarGIJoinPruneState       INTEGER,
    pimStarGIPrunePendingTimer    TimeTicks,
    pimStarGIJoinExpiryTimer      TimeTicks,
    pimStarGIAssertState          INTEGER,
    pimStarGIAssertTimer          TimeTicks,
    pimStarGIAssertWinnerAddressType InetAddressType,
    pimStarGIAssertWinnerAddress  InetAddress,
    pimStarGIAssertWinnerMetricPref Unsigned32,
    pimStarGIAssertWinnerMetric   Unsigned32
}

pimStarGIIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ifIndex of the interface that this entry corresponds
        to."
    ::= { pimStarGIEntry 1 }

pimStarGIUpTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The time since this entry was created by the local router."

```

```

    ::= { pimStarGIEntry 2 }

pimStarGILocalMembership OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Whether the local router has (*,G) local membership on this
        interface (resulting from a mechanism such as IGMP or MLD).
        This corresponds to local_receiver_include(*,G,I) in the
        PIM-SM specification."
    REFERENCE  "I-D.ietf-pim-sm-v2-new section 4.1.6"
    ::= { pimStarGIEntry 3 }

```

pimStarGIJoinPruneState OBJECT-TYPE

SYNTAX INTEGER {  
noInfo (1),  
join (2),  
prunePending (3)  
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The state resulting from (\*,G) Join/Prune messages received on this interface. This corresponds to the state of the downstream per-interface (\*,G) state machine in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.2](#)"

::= { pimStarGIEntry 4 }

pimStarGIPrunePendingTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining before the local router acts on a (\*,G) Prune message received on this interface, during which the router is waiting to see whether another downstream router will override the Prune message. This timer is called the (\*,G) Prune-Pending Timer in the PIM-SM specification. This object is zero if the timer is not running."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.1](#)"

::= { pimStarGIEntry 5 }

pimStarGIJoinExpiryTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining before (\*,G) Join state for this interface expires. This timer is called the (\*,G) Join Expiry Timer in the PIM-SM specification. This object is zero if the timer is not running. A value of 'FFFFFFFF'h indicates an infinite expiry time."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.10](#)"

::= { pimStarGIEEntry 6 }

pimStarGIAAssertState OBJECT-TYPE

SYNTAX INTEGER {  
noInfo (1),  
iAmAssertWinner (2),  
iAmAssertLoser (3)  
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The (\*,G) Assert state for this interface. This corresponds to the state of the per-interface (\*,G) Assert state machine in the PIM-SM specification. If pimStarGPimMode is 'bidir', this object must be 'noInfo'."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.6.2](#)"

::= { pimStarGIEEntry 7 }

pimStarGIAAssertTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If pimStarGIAAssertState is 'iAmAssertWinner', this is the time remaining before the local router next sends a (\*,G) Assert message on this interface. If pimStarGIAAssertState is 'iAmAssertLoser', this is the time remaining before the (\*,G) Assert state expires. If pimStarGIAAssertState is 'noInfo', this is zero. This timer is called the (\*,G) Assert Timer in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.6.2](#)"

::= { pimStarGIEEntry 8 }

pimStarGIAAssertWinnerAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If pimStarGIAAssertState is 'iAmAssertLoser', this is the address type of the assert winner; otherwise, this object is unknown(0)."

```
::= { pimStarGIEEntry 9 }
```

```
pimStarGIAssertWinnerAddress OBJECT-TYPE
```

```
SYNTAX      InetAddress (SIZE (0|4|16|20))
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "If pimStarGIAssertState is 'iAmAssertLoser', this is the  
    address of the assert winner. The InetAddressType is given  
    by the pimStarGIAssertWinnerAddressType object."
```

```
::= { pimStarGIEEntry 10 }
```

```
pimStarGIAssertWinnerMetricPref OBJECT-TYPE
```

```
SYNTAX      Unsigned32 (0..2147483647)
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "If pimStarGIAssertState is 'iAmAssertLoser', this is the  
    metric preference of the route to the RP advertised by the  
    assert winner; otherwise, this object is zero."
```

```
::= { pimStarGIEEntry 11 }
```

```
pimStarGIAssertWinnerMetric OBJECT-TYPE
```

```
SYNTAX      Unsigned32
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "If pimStarGIAssertState is 'iAmAssertLoser', this is the  
    routing metric of the route to the RP advertised by the  
    assert winner; otherwise, this object is zero."
```

```
::= { pimStarGIEEntry 12 }
```

```
--
```

```
-- The PIM (S,G) State Table
```

```
--
```

```
pimSGTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF PimSGEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The (conceptual) table listing the non-interface specific  
    (S,G) state that PIM has."
```

```
::= { pim 6 }
```

```
pimSGEntry OBJECT-TYPE
```

```
SYNTAX      PimSGEntry
```

```
MAX-ACCESS  not-accessible
```

Internet-Draft

PIM MIB

October 2005

```

STATUS      current
DESCRIPTION
    "An entry (conceptual row) in the pimSGTable."
INDEX       { pimSGAddressType,
              pimSGGrpAddress,
              pimSGSrcAddress }
 ::= { pimSGTable 1 }

```

```

PimSGEntry ::= SEQUENCE {
    pimSGAddressType      InetAddressType,
    pimSGGrpAddress       InetAddress,
    pimSGSrcAddress       InetAddress,
    pimSGUpTime           TimeTicks,
    pimSGPimMode          PimMode,
    pimSGUpstreamJoinState INTEGER,
    pimSGUpstreamJoinTimer TimeTicks,
    pimSGUpstreamNeighbor InetAddress,
    pimSGRPFIIfIndex      InterfaceIndexOrZero,
    pimSGRPFNextHopType   InetAddressType,
    pimSGRPFNextHop       InetAddress,
    pimSGRPFRouteProtocol IANAipRouteProtocol,
    pimSGRPFRouteAddress  InetAddress,
    pimSGRPFRoutePrefixLength InetAddressPrefixLength,
    pimSGRPFRouteMetricPref Unsigned32,
    pimSGRPFRouteMetric   Unsigned32,
    pimSGSPTBit            TruthValue,
    pimSGKeepaliveTimer    TimeTicks,
    pimSGDRRegisterState   INTEGER,
    pimSGDRRegisterStopTimer TimeTicks,
    pimSGRPRegisterPMBRAAddressType InetAddressType,
    pimSGRPRegisterPMBRAAddress  InetAddress
}

```

```

pimSGAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address type of the source and multicast group for this
        entry."
    ::= { pimSGEntry 1 }

```

```

pimSGGrpAddress OBJECT-TYPE

```

SYNTAX        InetAddress (SIZE (4|8|16|20))  
MAX-ACCESS not-accessible  
STATUS        current  
DESCRIPTION

"The multicast group address for this entry. The

InetAddressType is given by the pimSGAddressType object."  
 ::= { pimSGEntry 2 }

pimSGSrcAddress OBJECT-TYPE

SYNTAX        InetAddress (SIZE (4|8|16|20))  
MAX-ACCESS not-accessible  
STATUS        current  
DESCRIPTION

"The source address for this entry. The InetAddressType is  
 given by the pimSGAddressType object."

::= { pimSGEntry 3 }

pimSGUpTime OBJECT-TYPE

SYNTAX        TimeTicks  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION

"The time since this entry was created by the local router."

::= { pimSGEntry 4 }

pimSGPimMode OBJECT-TYPE

SYNTAX        PimMode { ssm(2), asm(3) }  
MAX-ACCESS read-only  
STATUS        current  
DESCRIPTION

"Whether pimSGGrpAddress is an SSM (Source Specific  
 Multicast, used with PIM-SM) or ASM (Any Source Multicast,  
 used with PIM-SM) group."

::= { pimSGEntry 5 }

pimSGUpstreamJoinState OBJECT-TYPE

SYNTAX        INTEGER {  
                notJoined (1),  
                joined (2)  
                }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the local router should join the shortest-path tree for the source and group represented by this entry. This corresponds to the state of the upstream (S,G) state machine in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.7](#)"

::= { pimSGEntry 6 }

pimSGUpstreamJoinTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

Sivaramu, et al.

Expires April 7, 2006

[Page 32]

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Internet-Draft

PIM MIB

October 2005

STATUS current

DESCRIPTION

"The time remaining before the local router next sends a periodic (S,G) Join message on pimSGRPFIfIndex. This timer is called the (S,G) Upstream Join Timer in the PIM-SM specification. This object is zero if the timer is not running."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.10](#) and 4.11"

::= { pimSGEntry 7 }

pimSGUpstreamNeighbor OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary address of the neighbor on pimSGRPFIfIndex that the local router is sending periodic (S,G) Join messages to. This is zero if the RPF next hop is unknown or is not a PIM neighbor. The InetAddressType is given by the pimSGAddressType object. This address is called RPF'(S,G) in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.1.6](#)"

::= { pimSGEntry 8 }

pimSGRPFIfIndex OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of ifIndex for the RPF interface towards the source, or zero if the RPF interface is unknown."  
 ::= { pimSGEntry 9 }

pimSGRPFNextHopType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type of the RPF next hop towards the source, or unknown(0) if the RPF next hop is unknown."

::= { pimSGEntry 10 }

pimSGRPFNextHop OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address of the RPF next hop towards the source. The

InetAddressType is given by the pimSGRPFNextHopType. This address is called MRIB.next\_hop(S) in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.5](#)"

::= { pimSGEntry 11 }

pimSGRPFRouteProtocol OBJECT-TYPE

SYNTAX IANAipRouteProtocol

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The routing mechanism via which the route used to find the RPF interface towards the source was learned."

::= { pimSGEntry 12 }

pimSGRPFRouteAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address which when combined with the corresponding value of pimSGRPFRoutePrefixLength identifies the route used

to find the RPF interface towards the source. The InetAddressType is given by the pimSGRPFNextHopType object.

This address object is only significant up to pimSGRPFRoutePrefixLength bits. The remainder of the address bits are zero."

::= { pimSGEntry 13 }

pimSGRPFRoutePrefixLength OBJECT-TYPE

SYNTAX InetAddressPrefixLength

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The prefix length which when combined with the corresponding value of pimSGRPFRouteAddress identifies the route used to find the RPF interface towards the source. The InetAddressType is given by the pimSGRPFNextHopType object."

::= { pimSGEntry 14 }

pimSGRPFRouteMetricPref OBJECT-TYPE

SYNTAX Unsigned32 (0..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The metric preference of the route used to find the RPF

interface towards the source."

::= { pimSGEntry 15 }

pimSGRPFRouteMetric OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The routing metric of the route used to find the RPF interface towards the source."

::= { pimSGEntry 16 }

pimSGSPTBit OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current  
DESCRIPTION  
    "Whether the SPT bit is set; and therefore whether forwarding is taking place on the shortest-path tree."  
 ::= { pimSGEntry 17 }

pimSGKeepaliveTimer OBJECT-TYPE

SYNTAX TimeTicks  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The time remaining before, in the absence of explicit (S,G) local membership or (S,G) Join messages received to maintain it, this (S,G) state expires. This timer is called the (S,G) Keepalive Timer in the PIM-SM specification."  
REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.1.4](#)"  
 ::= { pimSGEntry 18 }

pimSGDRRegisterState OBJECT-TYPE

SYNTAX INTEGER {  
    noInfo (1),  
    join (2),  
    joinPending (3),  
    prune (4)  
}  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "Whether the local router should encapsulate (S,G) data packets in Register messages and send them to the RP. This corresponds to the state of the per-(S,G) Register state machine in the PIM-SM specification. This object is always 'noInfo' unless pimSGPimMode is 'asm'."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.4.1](#)"  
 ::= { pimSGEntry 19 }

pimSGDRRegisterStopTimer OBJECT-TYPE

SYNTAX TimeTicks  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"If pimSGDRRegisterState is 'prune', this is the time remaining before the local router sends a Null-Register message to the RP. If pimSGDRRegisterState is 'joinPending', this is the time remaining before the local router resumes encapsulating data packets and sending them to the RP. Otherwise, this is zero. This timer is called the Register-Stop Timer in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.4](#)"  
 ::= { pimSGEntry 20 }

pimSGRPRRegisterPMBRAAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type of the first PIM Multicast Border Router to send a Register message with the Border bit set. This object is unknown(0) if the local router is not the RP for the group."

::= { pimSGEntry 21 }

pimSGRPRRegisterPMBRAAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|16|20))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address of the first PIM Multicast Border Router to send a Register message with the Border bit set. The InetAddressType is given by the pimSGRPRRegisterPMBRAAddressType object."

::= { pimSGEntry 22 }

--

-- The PIM (S,G,I) State Table

--

pimSGITable OBJECT-TYPE

SYNTAX SEQUENCE OF PimSGIEntry

MAX-ACCESS not-accessible

STATUS current

```

        "The (conceptual) table listing the interface-specific (S,G)
        state that PIM has."
 ::= { pim 7 }

pimSGIEntry OBJECT-TYPE
    SYNTAX      PimSGIEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the pimSGITable."
    INDEX       { pimSGAddressType,
                  pimSGGrpAddress,
                  pimSGSrcAddress,
                  pimSGIIfIndex }
 ::= { pimSGITable 1 }

PimSGIEntry ::= SEQUENCE {
    pimSGIIfIndex      InterfaceIndex,
    pimSGIUpTime        TimeTicks,
    pimSGILocalMembership TruthValue,
    pimSGIJoinPruneState INTEGER,
    pimSGIPrunePendingTimer TimeTicks,
    pimSGIJoinExpiryTimer TimeTicks,
    pimSGIAssertState   INTEGER,
    pimSGIAssertTimer    TimeTicks,
    pimSGIAssertWinnerAddressType InetAddressType,
    pimSGIAssertWinnerAddress   InetAddress,
    pimSGIAssertWinnerMetricPref Unsigned32,
    pimSGIAssertWinnerMetric    Unsigned32
}

pimSGIIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ifIndex of the interface that this entry corresponds
        to."
 ::= { pimSGIEntry 1 }

pimSGIUpTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The time since this entry was created by the local router."
 ::= { pimSGIEntry 2 }

```

pimSGILocalMembership OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the local router has (S,G) local membership on this interface (resulting from a mechanism such as IGMPv3 or MLDv2). This corresponds to local\_receiver\_include(S,G,I) in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.1.6](#), 4.6.1 and 4.6.2"  
::= { pimSGIEntry 3 }

pimSGIJoinPruneState OBJECT-TYPE

SYNTAX INTEGER {  
    noInfo (1),  
    join (2),  
    prunePending (3)  
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The state resulting from (S,G) Join/Prune messages received on this interface. This corresponds to the state of the downstream per-interface (S,G) state machine in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.3](#)"  
::= { pimSGIEntry 4 }

pimSGIPrunePendingTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining before the local router acts on an (S,G) Prune message received on this interface, during which the router is waiting to see whether another downstream router will override the Prune message. This timer is called the (S,G) Prune-Pending Timer in the PIM-SM specification. This object is zero if the timer is not running."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.3](#) and 4.5.4"  
::= { pimSGIEntry 5 }

pimSGIJoinExpiryTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The time remaining before (S,G) Join state for this

interface expires. This timer is called the (S,G) Join Expiry Timer in the PIM-SM specification. This object is zero if the timer is not running. A value of 'FFFFFFFF'h indicates an infinite expiry time."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.10](#)"

::= { pimSGIEntry 6 }

## pimSGIAssertState OBJECT-TYPE

SYNTAX INTEGER {  
noInfo (1),  
iAmAssertWinner (2),  
iAmAssertLoser (3)  
}

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The (S,G) Assert state for this interface. This corresponds to the state of the per-interface (S,G) Assert state machine in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.6.1](#)"

::= { pimSGIEntry 7 }

## pimSGIAssertTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"If pimSGIAssertState is 'iAmAssertWinner', this is the time remaining before the local router next sends a (S,G) Assert message on this interface. If pimSGIAssertState is 'iAmAssertLoser', this is the time remaining before the (S,G) Assert state expires. If pimSGIAssertState is 'noInfo', this is zero. This timer is called the (S,G) Assert Timer in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.6.1](#)"

::= { pimSGIEntry 8 }

## pimSGIAssertWinnerAddressType OBJECT-TYPE

SYNTAX InetAddressType

```

MAX-ACCESS read-only
STATUS      current
DESCRIPTION
    "If pimSGIAssertState is 'iAmAssertLoser', this is the
    address type of the assert winner; otherwise, this object is
    unknown(0)."
```

::= { pimSGIEntry 9 }

pimSGIAssertWinnerAddress OBJECT-TYPE

Sivaramu, et al.

Expires April 7, 2006

[Page 39]

Internet-Draft

PIM MIB

October 2005

```

SYNTAX      InetAddress (SIZE (0|4|16|20))
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
    "If pimSGIAssertState is 'iAmAssertLoser', this is the
    address of the assert winner. The InetAddressType is given
    by the pimSGIAssertWinnerAddressType object."
```

::= { pimSGIEntry 10 }

pimSGIAssertWinnerMetricPref OBJECT-TYPE

```

SYNTAX      Unsigned32 (0..2147483647)
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
    "If pimSGIAssertState is 'iAmAssertLoser', this is the
    metric preference of the route to the source advertised by
    the assert winner; otherwise, this object is zero."
```

::= { pimSGIEntry 11 }

pimSGIAssertWinnerMetric OBJECT-TYPE

```

SYNTAX      Unsigned32
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
    "If pimSGIAssertState is 'iAmAssertLoser', this is the
    routing metric of the route to the source advertised by the
    assert winner; otherwise, this object is zero."
```

::= { pimSGIEntry 12 }

```

--
-- The PIM (S,G,rpt) State Table
--
```

```
pimSGRptTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimSGRptEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the non-interface specific
        (S,G,rpt) state that PIM has."
    ::= { pim 8 }
```

```
pimSGRptEntry OBJECT-TYPE
    SYNTAX      PimSGRptEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the pimSGRptTable."
```

Sivaramu, et al.

Expires April 7, 2006

[Page 40]

---

Internet-Draft

PIM MIB

October 2005

```
INDEX      { pimStarGAddressType,
             pimStarGGrpAddress,
             pimSGRptSrcAddress }
::= { pimSGRptTable 1 }
```

```
PimSGRptEntry ::= SEQUENCE {
    pimSGRptSrcAddress      InetAddress,
    pimSGRptUpTime          TimeTicks,
    pimSGRptUpstreamPruneState  INTEGER,
    pimSGRptUpstreamOverrideTimer TimeTicks
}
```

```
pimSGRptSrcAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (4|8|16|20))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The source address for this entry.  The InetAddressType is
        given by the pimStarGAddressType object."
    ::= { pimSGRptEntry 1 }
```

```
pimSGRptUpTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
```

DESCRIPTION

"The time since this entry was created by the local router."  
 ::= { pimSGRptEntry 2 }

pimSGRptUpstreamPruneState OBJECT-TYPE

SYNTAX INTEGER {  
 rptNotJoined (1),  
 pruned (2),  
 notPruned (3)  
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the local router should prune the source off the RP tree. This corresponds to the state of the upstream (S,G,rpt) state machine for triggered messages in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.9](#)"

::= { pimSGRptEntry 3 }

pimSGRptUpstreamOverrideTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

Sivaramu, et al.

Expires April 7, 2006

[Page 41]

---

Internet-Draft

PIM MIB

October 2005

STATUS current

DESCRIPTION

"The time remaining before the local router sends a triggered (S,G,rpt) Join message on pimStarGRPFIfIndex. This timer is called the (S,G,rpt) Upstream Override Timer in the PIM-SM specification. This object is zero if the timer is not running."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.9](#)"

::= { pimSGRptEntry 4 }

--

-- The PIM (S,G,rpt,I) State Table

--

pimSGRptItable OBJECT-TYPE

SYNTAX SEQUENCE OF PimSGRptIEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The (conceptual) table listing the interface-specific  
(S,G,rpt) state that PIM has."

::= { pim 9 }

pimSGRptIEntry OBJECT-TYPE

SYNTAX PimSGRptIEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

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

INDEX { pimStarGAddressType,  
pimStarGGrpAddress,  
pimSGRptSrcAddress,  
pimSGRptIIfIndex }

::= { pimSGRptITable 1 }

PimSGRptIEntry ::= SEQUENCE {

pimSGRptIIfIndex InterfaceIndex,

pimSGRptIUpTime TimeTicks,

pimSGRptILocalMembership TruthValue,

pimSGRptIJoinPruneState INTEGER,

pimSGRptIPrunePendingTimer TimeTicks,

pimSGRptIPruneExpiryTimer TimeTicks

}

pimSGRptIIfIndex OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The ifIndex of the interface that this entry corresponds  
to."

::= { pimSGRptIEntry 1 }

pimSGRptIUpTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time since this entry was created by the local router."

::= { pimSGRptIEntry 2 }

pimSGRptILocalMembership OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the local router has both (\*,G) include local membership and (S,G) exclude local membership on this interface (resulting from a mechanism such as IGMPv3 or MLDv2). This corresponds to local\_receiver\_exclude(S,G,I) in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.1.6](#)"

::= { pimSGRptIEntry 3 }

pimSGRptIJoinPruneState OBJECT-TYPE

SYNTAX INTEGER {  
    noInfo (1),  
    prune (2),  
    prunePending (3)  
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The state resulting from (S,G,rpt) Join/Prune messages received on this interface. This corresponds to the state of the downstream per-interface (S,G,rpt) state machine in the PIM-SM specification."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.4](#)"

::= { pimSGRptIEntry 4 }

pimSGRptIPrunePendingTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining before the local router starts pruning

this source off the RP tree. This timer is called the (S,G,rpt) Prune-Pending Timer in the PIM-SM specification. This object is zero if the timer is not running."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.4](#)"

```

 ::= { pimSGRptIEntry 5 }

pimSGRptIPruneExpiryTimer OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The time remaining before (S,G,rpt) Prune state for this
        interface expires. This timer is called the (S,G,rpt)
        Prune Expiry Timer in the PIM-SM specification. This object
        is zero if the timer is not running. A value of 'FFFFFFFF'h
        indicates an infinite expiry time."
    REFERENCE "I-D.ietf-pim-sm-v2-new section 4.5.4"
    ::= { pimSGRptIEntry 6 }

--
-- The PIM Bidir DF-Election Table
--

pimBidirDFElectionTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimBidirDFElectionEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the per-RP Designated
        Forwarder (DF) Election state for each interface for all the
        RPs in BIDIR mode."
    ::= { pim 10 }

pimBidirDFElectionEntry OBJECT-TYPE
    SYNTAX      PimBidirDFElectionEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) in the pimBidirDFElectionTable."
    INDEX       { pimBidirDFElectionAddressType,
                  pimBidirDFElectionRPAddress,
                  pimBidirDFElectionIfIndex }
    ::= { pimBidirDFElectionTable 1 }

PimBidirDFElectionEntry ::= SEQUENCE {
    pimBidirDFElectionAddressType  InetAddressType,
    pimBidirDFElectionRPAddress    InetAddress,
    pimBidirDFElectionIfIndex      InterfaceIndex,

```

```
pimBidirDFElectionWinnerAddressType InetAddressType,
pimBidirDFElectionWinnerAddress      InetAddress,
pimBidirDFElectionWinnerUpTime        TimeTicks,
pimBidirDFElectionWinnerMetricPref    Unsigned32,
pimBidirDFElectionWinnerMetric        Unsigned32,
pimBidirDFElectionState                INTEGER,
pimBidirDFElectionStateTimer          TimeTicks
}
```

pimBidirDFElectionAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address type of the RP for which the DF state is being maintained."

::= { pimBidirDFElectionEntry 1 }

pimBidirDFElectionRPAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP address of the RP for which the DF state is being maintained. The InetAddressType is given by the pimBidirDFElectionAddressType object."

::= { pimBidirDFElectionEntry 2 }

pimBidirDFElectionIfIndex OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The value of ifIndex for the interface for which the DF state is being maintained."

::= { pimBidirDFElectionEntry 3 }

pimBidirDFElectionWinnerAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary address type of the winner of the DF Election process. A value of unknown(0) indicates there is currently no DF."

::= { pimBidirDFElectionEntry 4 }

Internet-Draft

PIM MIB

October 2005

```
SYNTAX      InetAddress (SIZE (0|4|16|20))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The primary IP address of the winner of the DF Election
    process. The InetAddressType is given by the
    pimBidirDFElectionWinnderAddressType object."
::= { pimBidirDFElectionEntry 5 }
```

pimBidirDFElectionWinnerUpTime OBJECT-TYPE

```
SYNTAX      TimeTicks
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The time since the current winner (last) became elected as
    the DF for this RP."
::= { pimBidirDFElectionEntry 6 }
```

pimBidirDFElectionWinnerMetricPref OBJECT-TYPE

```
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The metric preference advertised by the DF Winner, or zero
    if there is currently no DF."
::= { pimBidirDFElectionEntry 7 }
```

pimBidirDFElectionWinnerMetric OBJECT-TYPE

```
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The metric advertised by the DF Winner, or zero if there is
    currently no DF."
::= { pimBidirDFElectionEntry 8 }
```

pimBidirDFElectionState OBJECT-TYPE

```
SYNTAX      INTEGER {
                dfOffer(1),
                dfLose(2),
            }
```

```

        dfWinner(3),
        dfBackoff(4)
    }
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
    "The state of this interface with respect to DF-Election for
    this RP. The states correspond to the ones defined in the

```

```

        BIDIR-PIM specification."
REFERENCE "I-D.ietf-pim-bidir-07 section 3.5.3.1"
 ::= { pimBidirDFElectionEntry 9 }

pimBidirDFElectionStateTimer OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The minimum time remaining after which the local router
        will expire the current DF state represented by
        pimBidirDFElectionState."
    ::= { pimBidirDFElectionEntry 10 }

--
-- The PIM Static RP Table
--

pimStaticRPTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PimStaticRPEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table is used to create and manage static
        configuration of RPs.

        If the group prefixes configured for two or more rows in
        this table overlap, the row with the greatest value of
        pimStaticRPGrpPrefixLength is used for the overlapping
        range."
    ::= { pim 11 }

```

pimStaticRPEntry OBJECT-TYPE

```

SYNTAX      PimStaticRPEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "An entry (conceptual row) in the pimStaticRPTable.  This
    entry is preserved on agent restart."
INDEX       { pimStaticRPAddressType,
              pimStaticRPGrpAddress,
              pimStaticRPGrpPrefixLength }
 ::= { pimStaticRPTable 1 }

```

```

PimStaticRPEntry ::= SEQUENCE {
    pimStaticRPAddressType      InetAddressType,
    pimStaticRPGrpAddress       InetAddress,
    pimStaticRPGrpPrefixLength  InetAddressPrefixLength,
}

```

Sivaramu, et al.

Expires April 7, 2006

[Page 47]

Internet-Draft

PIM MIB

October 2005

```

    pimStaticRPRPAddress      InetAddress,
    pimStaticRPPimMode        PimMode,
    pimStaticRPOverrideDynamic TruthValue,
    pimStaticRPRowStatus      RowStatus,
    pimStaticRPPrecedence     Unsigned32
}

```

pimStaticRPAddressType OBJECT-TYPE

```

SYNTAX      InetAddressType
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The address type of this entry."
 ::= { pimStaticRPEntry 1 }

```

pimStaticRPGrpAddress OBJECT-TYPE

```

SYNTAX      InetAddress (SIZE (4|8|16|20))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The multicast group address which, when combined with
    pimStaticRPGrpPrefixLength, gives the group prefix for this
    entry.  The InetAddressType is given by the
    pimStaticRPAddressType object.

```

This address object is only significant up to

pimSGRPFRoutePrefixLength bits. The remainder of the address bits are zero. This is especially important for this index field, which is part of the index of this entry. Any non-zero bits would signify an entirely different entry."

::= { pimStaticRPEnt 2 }

pimStaticRPGrpPrefixLength OBJECT-TYPE

SYNTAX InetAddressPrefixLength (4..128)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The multicast group prefix length, which, when combined with pimStaticRPGrpAddress, gives the group prefix for this entry. The InetAddressType is given by the pimStaticRPAddressType object. If pimStaticRPAddressType is 'ipv4' or 'ipv4z', this object must be in the range 4..32. If pimStaticRPGrpAddressType is 'ipv6' or 'ipv6z', this object must be in the range 8..128."

::= { pimStaticRPEnt 3 }

pimStaticRPRPAddress OBJECT-TYPE

Sivaramu, et al.

Expires April 7, 2006

[Page 48]

---

Internet-Draft

PIM MIB

October 2005

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The IP address of the RP to be used for groups within this group prefix. The InetAddressType is given by the pimStaticRPAddressType object."

::= { pimStaticRPEnt 4 }

pimStaticRPPimMode OBJECT-TYPE

SYNTAX PimMode { ssm(2), asm(3), bidir(4) }

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The PIM mode to be used for groups in this group prefix.

If this object is set to ssm(2), then pimStaticRPRPAddress must be set to zero. No RP operations are ever possible for PIM Mode SSM."

```
DEFVAL { asm }
::= { pimStaticRPEnt 5 }
```

pimStaticRPOverrideDynamic OBJECT-TYPE

```
SYNTAX      TruthValue
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "Whether this static RP configuration overrides RP
    information learned dynamically for groups in this group
    prefix."
DEFVAL { false }
::= { pimStaticRPEnt 6 }
```

pimStaticRPRowStatus OBJECT-TYPE

```
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of this row, by which rows in this table can
    be created and destroyed.

    This status object cannot be set to active(1) before valid
    values have been written to pimStaticRPRPAddress.

    All writeable objects in this entry can be modified when the
    status of this entry is active(1)."
::= { pimStaticRPEnt 7 }
```

pimStaticRPPrecedence OBJECT-TYPE

```
SYNTAX      Unsigned32
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The value for pimGroupMappingPrecedence to be used for this
    static RP configuration. This allows fine control over
    which configuration is overridden by this static
    configuration.

    If this object is present, then pimStaticRPOverrideDynamic
    is ignored."
```

The absolute values of this object have a significance only on the local router and do not need to be coordinated with other routers. A setting of this object may have different effects when applied to other routers.

Do not use this object unless fine control of static RP behavior on the local router is required."

::= { pimStaticRPEntry 8 }

--

-- The PIM Anycast-RP Set Table

--

pimAnycastRPSetTable OBJECT-TYPE

SYNTAX SEQUENCE OF PimAnycastRPSetEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table is used to create and manage Anycast-RP via PIM Register messages, as opposed to via other protocols such as MSDP.

Entries must be configured in this table if and only if the local router is a member of one or more Anycast-RP sets, that is, one or more Anycast-RP addresses are assigned to the local router. Note that if using static RP configuration, this is in addition to, not instead of, the pimStaticRPTable entries that must be configured for the Anycast-RPs.

The set of rows with the same values of both pimAnycastRPSetAddressType and pimAnycastRPSetAnycastAddress corresponds to the Anycast-RP set for that Anycast-RP address.

When an Anycast-RP set configuration is active, one entry per pimAnycastRPSetAnycastAddress corresponds to the local router. The local router is identified by the pimAnycastRpSetLocalRouter object. That entry determines the source address used by the local router when forwarding

PIM Register messages within the Anycast-RP set."  
REFERENCE "I-D.ietf-pim-anycast-rp-04"  
::= { pim 12 }

pimAnycastRPSetEntry OBJECT-TYPE

SYNTAX PimAnycastRPSetEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry corresponds to a single router within a particular  
Anycast-RP set. This entry is preserved on agent restart."

INDEX { pimAnycastRPSetAddressType,  
pimAnycastRPSetAnycastAddress,  
pimAnycastRPSetRouterAddress }

::= { pimAnycastRPSetTable 1 }

PimAnycastRPSetEntry ::= SEQUENCE {

pimAnycastRPSetAddressType InetAddressType,

pimAnycastRPSetAnycastAddress InetAddress,

pimAnycastRPSetRouterAddress InetAddress,

pimAnycastRPSetRowStatus RowStatus,

pimAnycastRPSetLocalRouter TruthValue

}

pimAnycastRPSetAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address type of the Anycast-RP address and router  
address."

::= { pimAnycastRPSetEntry 1 }

pimAnycastRPSetAnycastAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Anycast-RP address. The InetAddressType is given by  
the pimAnycastRPSetAddressType object."

::= { pimAnycastRPSetEntry 2 }

pimAnycastRPSetRouterAddress OBJECT-TYPE

SYNTAX        InetAddress (SIZE (4|8|16|20))  
 MAX-ACCESS not-accessible  
 STATUS        current  
 DESCRIPTION  
       "The address of a router that is a member of the Anycast-RP set. The InetAddressType is given by the pimAnycastRPSetAddressType object.

      This address differs from pimAnycastRPSetAnycastAddress. Equal values for these two addresses in a single entry is not permitted. That would cause a Register loop."

::= { pimAnycastRPSetEntry 3 }

pimAnycastRPSetRowStatus OBJECT-TYPE

SYNTAX        RowStatus  
 MAX-ACCESS read-create  
 STATUS        current  
 DESCRIPTION  
       "The status of this row, by which rows in this table can be created and destroyed. There are no other other writeable columnar objects in this entry."

::= { pimAnycastRPSetEntry 4 }

pimAnycastRPSetLocalRouter OBJECT-TYPE

SYNTAX        TruthValue  
 MAX-ACCESS read-only  
 STATUS        current  
 DESCRIPTION  
       "Whether this entry corresponds to the local router."

::= { pimAnycastRPSetEntry 5 }

--

-- The PIM Group Mapping Table

--

pimGroupMappingTable OBJECT-TYPE

SYNTAX        SEQUENCE OF PimGroupMappingEntry  
 MAX-ACCESS not-accessible  
 STATUS        current  
 DESCRIPTION

      "The (conceptual) table listing mappings from multicast group prefixes to the PIM mode and RP address to use for groups within that group prefix.

      Rows in this table are created for a variety of reasons, indicated by the value of the pimGroupMappingOrigin object.

      - Rows with a pimGroupMappingOrigin value of 'fixed' are

Internet-Draft

PIM MIB

October 2005

created automatically by the router at startup, to correspond to the well-defined prefixes of link-local and unroutable group addresses. These rows are never destroyed.

- Rows with a `pimGroupMappingOrigin` value of 'embedded' are created by the router to correspond to group prefixes that are to be treated as being in Embedded-RP format.
- Rows with a `pimGroupMappingOrigin` value of 'configRp' are created and destroyed as a result of rows in the `pimStaticRPTTable` being created and destroyed.
- Rows with a `pimGroupMappingOrigin` value of 'configSsm' are created and destroyed as a result of configuration of SSM address ranges to the local router.
- Rows with a `pimGroupMappingOrigin` value of 'bsr' are created as a result of running the PIM Bootstrap Router (BSR) mechanism. If the local router is not the elected BSR, these rows are created to correspond to group prefixes in the PIM Bootstrap messages received from the elected BSR. If the local router is the elected BSR, these rows are created to correspond to group prefixes in the PIM Bootstrap messages that the local router sends. In either case, these rows are destroyed when the group prefixes are timed out by the BSR mechanism.
- Rows with a `pimGroupMappingOrigin` value of 'other' are created and destroyed according to some other mechanism not specified here.

Given the collection of rows in this table at any point in time, the PIM mode and RP address to use for a particular group is determined using the following algorithm.

1. From the set of all rows, the subset whose group prefix contains the group in question are selected.
2. If there are no such rows, the behavior is undefined.
3. If there is at least one such row, from the selected

subset of rows, the subset that have the lowest value of pimGroupMappingPrecedence are selected.

4. From the selected subset of rows, the subset that have the greatest value of pimGroupMappingGrpPrefixLength are selected.

5. If there are multiple selected rows, the subset that have the highest precedence (the lowest numerical value for pimGroupMappingPrecedence) are selected.
6. If there are multiple selected rows, the row selected is implementation dependent; the implementation might or might not apply the PIM hash function to select the row.
7. The group mode to use is given by the value of pimGroupMappingPimMode from the single selected row; the RP to use is given by the value of pimGroupMappingRPAddress, unless pimGroupMappingOrigin is 'embedded', in which case the RP is extracted from the group address in question."

REFERENCE "[RFC 3956](#)"

::= { pim 13 }

pimGroupMappingEntry OBJECT-TYPE

SYNTAX PimGroupMappingEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

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

INDEX { pimGroupMappingOrigin,  
pimGroupMappingAddressType,  
pimGroupMappingGrpAddress,  
pimGroupMappingGrpPrefixLength,  
pimGroupMappingRPAddress }

::= { pimGroupMappingTable 1 }

PimGroupMappingEntry ::= SEQUENCE {

pimGroupMappingOrigin PimGroupMappingOriginType,

pimGroupMappingAddressType InetAddressType,

pimGroupMappingGrpAddress InetAddress,

pimGroupMappingGrpPrefixLength InetAddressPrefixLength,

```

    pimGroupMappingRPAAddress      InetAddress,
    pimGroupMappingPimMode         PimMode,
    pimGroupMappingPrecedence      Unsigned32
}

```

pimGroupMappingOrigin OBJECT-TYPE

SYNTAX PimGroupMappingOriginType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The mechanism by which this group mapping was learned."

::= { pimGroupMappingEntry 1 }

Sivaramu, et al.

Expires April 7, 2006

[Page 54]

Internet-Draft

PIM MIB

October 2005

pimGroupMappingAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address type of the IP multicast group prefix."

::= { pimGroupMappingEntry 2 }

pimGroupMappingGrpAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP multicast group address which, when combined with pimGroupMappingGrpPrefixLength, gives the group prefix for this mapping. The InetAddressType is given by the pimGroupMappingAddressType object.

This address object is only significant up to pimGroupMappingGrpPrefixLength bits. The remainder of the address bits are zero. This is especially important for this index field, which is part of the index of this entry. Any non-zero bits would signify an entirely different entry."

::= { pimGroupMappingEntry 3 }

pimGroupMappingGrpPrefixLength OBJECT-TYPE

SYNTAX InetAddressPrefixLength (4..128)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The multicast group prefix length, which, when combined with pimGroupMappingGrpAddress, gives the group prefix for this mapping. The InetAddressType is given by the pimGroupMappingAddressType object. If pimGroupMappingAddressType is 'ipv4' or 'ipv4z', this object must be in the range 4..32. If pimGroupMappingAddressType is 'ipv6' or 'ipv6z', this object must be in the range 8..128."

::= { pimGroupMappingEntry 4 }

pimGroupMappingRPAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|8|16|20))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP address of the RP to be used for groups within this group prefix, or zero if no RP is to be used or if the RP

address is unknown. The InetAddressType is given by the pimGroupMappingAddressType object. This object must be zero if pimGroupMappingPimMode is 'ssm', or if pimGroupMappingOrigin is 'embedded'."

::= { pimGroupMappingEntry 5 }

pimGroupMappingPimMode OBJECT-TYPE

SYNTAX PimMode

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The PIM mode to be used for groups in this group prefix."

::= { pimGroupMappingEntry 6 }

pimGroupMappingPrecedence OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The precedence of this row, used in the algorithm that determines which row applies to a given group address

(described above). Numerically higher values for this object indicate lower precedences, with the value zero denoting the highest precedence.

The absolute values of this object have a significance only on the local router and do not need to be coordinated with other routers."

::= { pimGroupMappingEntry 7 }

--

-- PIM Traps

--

pimNeighborLoss NOTIFICATION-TYPE

OBJECTS { pimNeighborUpTime }

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 the same IP version and a lower IP address than itself."

::= { pimTraps 1 }

pimUnexpectedRegisterAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

Sivaramu, et al.

Expires April 7, 2006

[Page 56]

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Internet-Draft

PIM MIB

October 2005

STATUS current

DESCRIPTION

"The address type stored in pimUnexpectedRegisterOrigin, pimUnexpectedRegisterGroup and pimUnexpectedRegisterRp.

If no unexpected Register messages have been received, then this object is set to unknown(0)."

::= { pimTraps 2 }

pimUnexpectedRegisterOrigin OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|8|16|20))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The source address of the last unexpected Register message  
        received by this device."  
 ::= { pimTraps 3 }

pimUnexpectedRegisterGroup OBJECT-TYPE

SYNTAX       InetAddress (SIZE (0|4|8|16|20))

MAX-ACCESS   read-only

STATUS       current

DESCRIPTION

        "The IP multicast group address to which the last unexpected  
        Register message received by this device was addressed."

::= { pimTraps 4 }

pimUnexpectedRegisterRp OBJECT-TYPE

SYNTAX       InetAddress (SIZE (0|4|8|16|20))

MAX-ACCESS   read-only

STATUS       current

DESCRIPTION

        "The RP address to which the last unexpected Register  
        message received by this device was delivered."

::= { pimTraps 5 }

pimUnexpectedRegister NOTIFICATION-TYPE

OBJECTS { pimGroupMappingPimMode,  
          pimUnexpectedRegisterAddressType,  
          pimUnexpectedRegisterOrigin,  
          pimUnexpectedRegisterGroup,  
          pimUnexpectedRegisterRp  
        }

STATUS       current

DESCRIPTION

        "A pimUnexpectedRegister trap signifies that an unexpected  
        Register message was received by this device. This  
        indicates that the originating router and this router have

different Group to RP mappings.

This trap may also signify that this router believes the group address to be within the SSM range, but the origin of the Register has implied ASM usage by sending this Register message.

If the local router has one or more Group to RP mappings for this group, then the object pimGroupMappingPimMode specifies the mapping currently being used (the one with the lowest value for pimGroupMappingPrecedence).

If the local router has no Group to RP mapping for this group, then the object pimGroupMappingPimMode is absent.

This trap may indicate a transient condition while new RP mappings are propagating through the network. If it occurs repeatedly over an extended period, then there is a persisting configuration error that requires correction.

The effect is that multicast data is being discarded, because this router discards the unexpected Register messages. The discarded data is from a source directly connected to pimUnexpectedRegisterOrigin, and is addressed to pimUnexpectedRegisterGroup.

The condition that causes this trap can occur very frequently. Routers may choose to limit the rate at which pimUnexpectedRegister is sent."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.4.2](#)"

::= { pimTraps 6 }

pimUnexpectedJoinPruneAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type stored in pimUnexpectedJoinPruneOrigin, pimUnexpectedJoinPruneGroup and pimUnexpectedJoinPrune.

If no unexpected Join/Prune messages have been received, this object is set to unknown(0)."

::= { pimTraps 7 }

pimUnexpectedJoinPruneOrigin OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|8|16|20))

MAX-ACCESS read-only

STATUS current

#### DESCRIPTION

"The source address of the last unexpected Join/Prune message received by this device."

::= { pimTraps 8 }

#### pimUnexpectedJoinPruneGroup OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|8|16|20))

MAX-ACCESS read-only

STATUS current

#### DESCRIPTION

"The IP multicast group address carried in the last unexpected Join/Prune message received by this device."

::= { pimTraps 9 }

#### pimUnexpectedJoinPruneRp OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|4|8|16|20))

MAX-ACCESS read-only

STATUS current

#### DESCRIPTION

"The RP address carried in the last unexpected Join/Prune message received by this device."

::= { pimTraps 10 }

#### pimUnexpectedJoinPrune NOTIFICATION-TYPE

OBJECTS { pimGroupMappingPimMode,  
pimUnexpectedJoinPruneAddressType,  
pimUnexpectedJoinPruneOrigin,  
pimUnexpectedJoinPruneGroup,  
pimUnexpectedJoinPruneRp,  
pimNeighborUpTime  
}

STATUS current

#### DESCRIPTION

"A pimUnexpectedJoinPrune trap signifies that an unexpected Join/Prune message was received by this device. This indicates that this router and one of its neighbors have different Group to RP mappings.

This trap may also signify that this router believes the group address to be within the SSM range, but the origin of the JoinPrune has implied ASM usage by sending this Join/Prune(\*,G).

If the local router has one or more Group to RP mappings for this group, then the object pimGroupMappingPimMode specifies the mapping currently being used (the one with the lowest value for pimGroupMappingPrecedence).

Internet-Draft

PIM MIB

October 2005

If the local router has no Group to RP mapping for this group, then the object `pimGroupMappingPimMode` is absent.

If the neighbor that sent this Join/Prune is known, then it is identified by `pimNeighborUpTime`. Otherwise `pimNeighborUpTime` is absent.

This trap may indicate a transient condition while new RP mappings are propagating through the network. If it occurs repeatedly over an extended period, then there is a persisting configuration error that requires correction.

The effect is that ASM multicast data will not reach listeners below the neighbor identified by `pimNeighborUpTime` because this router will ignore the Join/Prune request.

The condition that causes this trap can occur very frequently. Routers may choose to limit the rate at which `pimUnexpectedJoinPrune` is sent."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.5.2](#)"

::= { pimTraps 11 }

`pimRPMappingChangeType` OBJECT-TYPE

```
SYNTAX      INTEGER { newMapping(1),
                        deletedMapping(2),
                        modifiedOldMapping(3),
                        modifiedNewMapping(4),
                        highestPrecedenceOldMapping(5),
                        highestPrecedenceNewMapping(6)
                      }
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The operation that resulted in the most recent `pimRPMappingChange` notification.

- o `newMapping` indicates that a new mapping has been added into the `pimGroupMappingTable`, and that this new entry is now the highest precedence mapping for the group.
- o `deletedMapping` indicates that a mapping has been deleted from the `pimGroupMappingTable`, and that the deleted entry was the highest precedence mapping for the

group. If there are other entries for this group, then this is immediately followed by an additional notification of type highestPrecedenceNewMapping.

o modifiedOldMapping indicates that the mapping that had the

highest precedence is being modified. This is immediately followed by an additional notification of type modifiedNewMapping or highestPrecedenceNewMapping containing the new RP address.

- o modifiedNewMapping indicates the mapping that has the highest precedence has just been modified. This immediately follows a notification of type modifiedOldMapping or highestPrecedenceOldMapping.
- o highestPrecedenceOldMapping is similar to modifiedOldMapping, but the old mapping entry is not being modified. This notification states that it is no longer the active mapping, because another mapping now has the highest precedence. This is immediately followed by an additional notification of type newMapping or modifiedNewMapping containing the new RP address.
- o highestPrecedenceNewMapping is similar to modifiedNewMapping, but the new mapping entry has not been modified. This notification states that an existing entry is now the active mapping, because another mapping has been deleted or reduced in precedence. This notification immediately follows a notification of type deletedMapping or modifiedOldMapping."

::= { pimTraps 12 }

pimRPMappingChange NOTIFICATION-TYPE

OBJECTS { pimGroupMappingPimMode,  
          pimGroupMappingPrecedence,  
          pimRPMappingChangeType  
          }

STATUS current

DESCRIPTION

"A pimRPMappingChange trap signifies a change in the active RP Mapping on this device. The type of change is indicated

by pimRPMappingChangeType.

Not all changes to the pimGroupMappingTable cause a pimRPMappingChange trap. Only those changes that modify the pimGroupMappingEntry with the highest precedence for a group (lowest value of pimGroupMappingPrecedence) cause traps.

Traps with pimRPMappingChangeType set to deletedMapping, modifiedOldMapping or highestPrecedenceOldMapping always contain an old RP mapping that is about to be replaced.

Traps with pimRPMappingChangeType set to newMapping, modifiedNewMapping or highestPrecedenceNewMapping always contain the new RP mapping that is now in use.

The condition that causes this trap can occur frequently. Routers may choose to limit the rate at which pimRPMappingChange is sent."

::= { pimTraps 13 }

#### pimDRElection NOTIFICATION-TYPE

OBJECTS { pimInterfaceDR }

STATUS current

#### DESCRIPTION

"A pimDRElection trap signifies that a new DR has been elected on a network.

This trap is only sent if the router is elected as the new DR, or if the router was the DR before this election.

A router may choose not to send this trap until it has sent a periodic Hello on this interface. At the time when the first periodic Hello is sent, a router may choose to send a pimDRElection trap if it is the DR at that time. This suppresses misleading pimDRElection traps during router startup and reboot."

REFERENCE "I-D.ietf-pim-sm-v2-new [section 4.3.2](#)"

::= { pimTraps 14 }

-- Conformance Information

--

```
pimMIBConformance OBJECT IDENTIFIER ::= { pimStdMIB 2 }
pimMIBCompliances OBJECT IDENTIFIER ::= { pimMIBConformance 1 }
pimMIBGroups      OBJECT IDENTIFIER ::= { pimMIBConformance 2 }
```

--

-- Compliance Statements

--

```
pimMIBCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for the PIM MIB."
    MODULE -- this module
    MANDATORY-GROUPS { pimTopologyGroup }
    ::= { pimMIBCompliances 1 }
```

Sivaramu, et al.

Expires April 7, 2006

[Page 62]

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Internet-Draft

PIM MIB

October 2005

--

-- Units of Conformance

--

```
pimTopologyGroup OBJECT-GROUP
    OBJECTS { pimInterfaceAddressType,
               pimInterfaceAddress,
               pimInterfaceDR,
               pimInterfaceHelloHoldtime,
               pimInterfaceJoinPruneHoldtime,
               pimInterfaceGenerationIDValue,
               pimInterfaceLanDelayEnabled,
               pimInterfaceEffectPropagDelay,
               pimInterfaceEffectOverrideIvl,
               pimInterfaceSuppressionEnabled,
               pimInterfaceBidirCapable,
               pimInterfaceDRPriorityEnabled,
               pimNeighborUpTime,
               pimNeighborExpiryTime,
               pimNeighborLanPruneDelayPresent,
               pimNeighborPropagationDelay,
               pimNeighborOverrideInterval,
```

```

        pimNeighborTBit,
        pimNeighborGenerationIDPresent,
        pimNeighborGenerationIDValue,
        pimNeighborBidirCapable,
        pimNeighborDRPriorityPresent,
        pimNeighborDRPriority,
        pimNbrSecAddress
    }
STATUS    current
DESCRIPTION
    "A collection of read-only objects used to report local PIM
    topology."
::= { pimMIBGroups 1 }

```

```

pimNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS { pimNeighborLoss }
    STATUS    current
    DESCRIPTION
        "A collection of notifications for signaling important PIM
        events."
    ::= { pimMIBGroups 2 }

```

```

pimTuningParametersGroup OBJECT-GROUP
    OBJECTS { pimKeepalivePeriod,
        pimRegisterSuppressionTime,
        pimInterfaceHelloInterval,

```

```

        pimInterfaceTrigHelloInterval,
        pimInterfaceJoinPruneInterval,
        pimInterfacePropagationDelay,
        pimInterfaceOverrideInterval,
        pimInterfaceDRPriority,
        pimInterfaceDomainBorder,
        pimInterfaceStatus,
        pimInterfaceStubInterface
    }
STATUS    current
DESCRIPTION
    "A collection of writeable objects used to configure PIM
    behavior and to tune performance."
::= { pimMIBGroups 3 }

```

```

pimRouterStatisticsGroup OBJECT-GROUP
    OBJECTS { pimStarGEntries,
               pimStarGIEEntries,
               pimSGEntries,
               pimSGIEEntries,
               pimSGRptEntries,
               pimSGRptIEEntries
            }
    STATUS current
    DESCRIPTION
        "A collection of statistics global to the PIM router."
    ::= { pimMIBGroups 4 }

```

```

pimSsmGroup OBJECT-GROUP
    OBJECTS { pimSGUpTime,
               pimSGPimMode,
               pimSGUpstreamJoinState,
               pimSGUpstreamJoinTimer,
               pimSGUpstreamNeighbor,
               pimSGRPFIIfIndex,
               pimSGRPFNextHopType,
               pimSGRPFNextHop,
               pimSGRPFRouteProtocol,
               pimSGRPFRouteAddress,
               pimSGRPFRoutePrefixLength,
               pimSGRPFRouteMetricPref,
               pimSGRPFRouteMetric,
               pimSGSPTBit,
               pimSGKeepaliveTimer,
               pimSGDRRegisterState,
               pimSGDRRegisterStopTimer,
               pimSGRPRegisterPMBRAAddressType,
               pimSGRPRegisterPMBRAAddress,

```

```

    pimSGIUpTime,
    pimSGILocalMembership,
    pimSGIJoinPruneState,
    pimSGIPrunePendingTimer,
    pimSGIJoinExpiryTimer,
    pimSGIAssertState,
    pimSGIAssertTimer,
    pimSGIAssertWinnerAddressType,

```

```

        pimSGIAssertWinnerAddress,
        pimSGIAssertWinnerMetricPref,
        pimSGIAssertWinnerMetric
    }
STATUS    current
DESCRIPTION
    "A collection of objects to support management of PIM
    routers running the PIM SSM (Source Specific Multicast)
    protocol, in PIM mode SM (Sparse Mode)."
 ::= { pimMIBGroups 5 }

pimRPConfigGroup OBJECT-GROUP
    OBJECTS { pimStaticRPRPAddress,
               pimStaticRPPimMode,
               pimStaticRPOVERRIDEdynamic,
               pimStaticRPRowStatus,
               pimGroupMappingPimMode,
               pimGroupMappingPrecedence
    }
STATUS    current
DESCRIPTION
    "A collection of objects to support configuration of RPs
    (Rendezvous Points) and Group Mappings."
 ::= { pimMIBGroups 6 }

pimSmGroup OBJECT-GROUP
    OBJECTS { pimStarGUpTime,
               pimStarGPimMode,
               pimStarGRPAddressType,
               pimStarGRPAddress,
               pimStarGPimModeOrigin,
               pimStarGRPIsLocal,
               pimStarGUpstreamJoinState,
               pimStarGUpstreamJoinTimer,
               pimStarGUpstreamNeighborType,
               pimStarGUpstreamNeighbor,
               pimStarGRPFIIfIndex,
               pimStarGRPFPNextHopType,
               pimStarGRPFPNextHop,
               pimStarGRPFRouteProtocol,
    }

```

pimStarGRPFRouteAddress,

```

        pimStarGRPFRoutePrefixLength,
        pimStarGRPFRouteMetricPref,
        pimStarGRPFRouteMetric,
        pimStarGIUpTime,
        pimStarGILocalMembership,
        pimStarGIJoinPruneState,
        pimStarGIPrunePendingTimer,
        pimStarGIJoinExpiryTimer,
        pimStarGIAssertState,
        pimStarGIAssertTimer,
        pimStarGIAssertWinnerAddressType,
        pimStarGIAssertWinnerAddress,
        pimStarGIAssertWinnerMetricPref,
        pimStarGIAssertWinnerMetric,
        pimSGRptUpTime,
        pimSGRptUpstreamPruneState,
        pimSGRptUpstreamOverrideTimer,
        pimSGRptIUpTime,
        pimSGRptILocalMembership,
        pimSGRptIJoinPruneState,
        pimSGRptIPrunePendingTimer,
        pimSGRptIPruneExpiryTimer
    }
STATUS    current
DESCRIPTION
    "A collection of objects to support management of PIM
    routers running PIM-SM (Sparse Mode).  The groups
    pimSsmGroup and pimRPConfigGroup are also required."
::= { pimMIBGroups 7 }

```

```

pimBidirGroup OBJECT-GROUP
    OBJECTS { pimInterfaceDFElectionRobustness,
        pimBidirDFElectionWinnerAddressType,
        pimBidirDFElectionWinnerAddress,
        pimBidirDFElectionWinnerUpTime,
        pimBidirDFElectionWinnerMetricPref,
        pimBidirDFElectionWinnerMetric,
        pimBidirDFElectionState,
        pimBidirDFElectionStateTimer
    }
STATUS    current
DESCRIPTION
    "A collection of objects to support management of PIM
    routers running BIDIR mode.  The groups pimSsmGroup,
    pimSmGroup and pimRPConfigGroup are also required."
::= { pimMIBGroups 8 }

```

```
pimAnycastRpGroup OBJECT-GROUP
    OBJECTS { pimAnycastRPSetRowStatus,
               pimAnycastRPSetLocalRouter
            }
    STATUS    current
    DESCRIPTION
        "A collection of objects to support management of the PIM
        Anycast-RP mechanism."
    ::= { pimMIBGroups 9 }

pimStaticRPPrecedenceGroup OBJECT-GROUP
    OBJECTS { pimStaticRPPrecedence }
    STATUS    current
    DESCRIPTION
        "A collection of objects to allow fine control of
        interactions between static RP configuration and
        dynamically acquired group to RP mappings."
    ::= { pimMIBGroups 10 }

pimNetMgmtNotificationObjects OBJECT-GROUP
    OBJECTS { pimUnexpectedRegisterAddressType,
               pimUnexpectedRegisterOrigin,
               pimUnexpectedRegisterGroup,
               pimUnexpectedRegisterRp,
               pimUnexpectedJoinPruneAddressType,
               pimUnexpectedJoinPruneOrigin,
               pimUnexpectedJoinPruneGroup,
               pimUnexpectedJoinPruneRp,
               pimRPMappingChangeType
            }
    STATUS    current
    DESCRIPTION
        "Objects required by notification for signaling PIM network
        management events."
    ::= { pimMIBGroups 11 }

pimNetMgmtNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS { pimUnexpectedRegister,
                    pimUnexpectedJoinPrune,
                    pimRPMappingChange,
                    pimDRElection
                  }
    STATUS    current
    DESCRIPTION
        "A collection of notifications for signaling PIM network
        management events."
```

::= { pimMIBGroups 12 }

Internet-Draft

PIM MIB

October 2005

END

## [5.](#) Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

The following tables and objects could be employed to modify multicast routing behavior in a way that prevents or disrupts services provided by the network, including (but not limited to) multicast data traffic delivery.

The following tables and objects may also be used to modify multicast routing behavior in order to intercept or subvert any information that is carried by the network. For example, attacks can be envisaged that would pass nominated multicast data streams through a nominated location, without the sources or listeners becoming aware of this subversion.

pimKeepalivePeriod  
pimRegisterSuppressionTime  
pimInterfaceTable  
pimInterfaceEntry  
pimInterfaceHelloInterval  
pimInterfaceTrigHelloInterval  
pimInterfaceJoinPruneInterval  
pimInterfaceDFElectionRobustness  
pimInterfacePropagationDelay  
pimInterfaceOverrideInterval  
pimInterfaceDomainBorder  
pimInterfaceStatus  
pimInterfaceStubInterface  
pimStaticRPTTable

pimStaticRPEntry  
pimStaticRPAddressType  
pimStaticRPGrpAddress  
pimStaticRPGrpPrefixLength  
pimStaticRPPRPAddress  
pimStaticRPPimMode  
pimStaticRPOVERRIDEdynamic  
pimStaticRPRowStatus  
pimStaticRPPrecedence

pimAnycastRPSetTable  
pimAnycastRPSetEntry  
pimAnycastRPSetAddressType  
pimAnycastRPSetAnycastAddress  
pimAnycastRPSetRouterAddress  
pimAnycastRPSetRowStatus  
pimAnycastRPSetLocalRouter

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

The following tables and objects could be employed to determine the topology, disposition, and composition of the network. This information may be commercially sensitive, and may also be used in preparation for attacks, including any of the attacks described above.

The following tables and objects may also be used to determine whether multicast data is flowing in the network, or has flowed recently. They may also be used to determine the network location of senders and recipients. An attacker can apply 'traffic analysis' to this data. In some cases, the information revealed by traffic analyses can be as damaging as full knowledge of the data being transported.

pimKeepalivePeriod  
pimRegisterSuppressionTime

pimStarGEntries  
pimStarGIEEntries  
pimSGEntries  
pimSGIEEntries  
pimSGRptEntries  
pimSGRptIEEntries  
pimInterfaceTable  
pimInterfaceEntry  
pimInterfaceIfIndex  
pimInterfaceIPVersion  
pimInterfaceAddressType  
pimInterfaceAddress  
pimInterfaceDR  
pimInterfaceHelloInterval  
pimInterfaceTrigHelloInterval  
pimInterfaceJoinPruneInterval

pimInterfaceDFElectionRobustness  
pimInterfaceHelloHoldtime  
pimInterfaceJoinPruneHoldtime  
pimInterfacePropagationDelay  
pimInterfaceOverrideInterval  
pimInterfaceGenerationIDValue  
pimInterfaceDRPriority  
pimInterfaceLanDelayEnabled  
pimInterfaceEffectPropagDelay  
pimInterfaceEffectOverrideIvl  
pimInterfaceSuppressionEnabled  
pimInterfaceBidirCapable  
pimInterfaceDRPriorityEnabled  
pimInterfaceDomainBorder  
pimInterfaceStatus  
pimInterfaceStubInterface  
pimNeighborTable  
pimNeighborEntry  
pimNeighborIfIndex  
pimNeighborAddressType  
pimNeighborAddress  
pimNeighborUpTime  
pimNeighborExpiryTime  
pimNeighborLanPruneDelayPresent  
pimNeighborPropagationDelay

pimNeighborOverrideInterval  
pimNeighborTBit  
pimNeighborGenerationIDPresent  
pimNeighborGenerationIDValue  
pimNeighborBidirCapable  
pimNeighborDRPriorityPresent  
pimNeighborDRPriority  
pimNbrSecAddressTable  
pimNbrSecAddressEntry  
pimNbrSecAddressIfIndex  
pimNbrSecAddressType  
pimNbrSecAddressPrimary  
pimNbrSecAddress  
pimStarGTable  
pimStarGEntry  
pimStarGAddressType  
pimStarGGrpAddress  
pimStarGUpTime  
pimStarGPimMode  
pimStarGRPAddressType  
pimStarGRPAddress  
pimStarGPimModeOrigin  
pimStarGRPIsLocal

pimStarGUpstreamJoinState  
pimStarGUpstreamJoinTimer  
pimStarGUpstreamNeighborType  
pimStarGUpstreamNeighbor  
pimStarGRPFIIfIndex  
pimStarGRPFPNextHopType  
pimStarGRPFPNextHop  
pimStarGRPFRouteProtocol  
pimStarGRPFRouteAddress  
pimStarGRPFRoutePrefixLength  
pimStarGRPFRouteMetricPref  
pimStarGRPFRouteMetric  
pimStarGITable  
pimStarGIEntry  
pimStarGIIfIndex  
pimStarGIUpTime  
pimStarGILocalMembership  
pimStarGIJoinPruneState

pimStarGIPrunePendingTimer  
pimStarGIJoinExpiryTimer  
pimStarGIAssertState  
pimStarGIAssertTimer  
pimStarGIAssertWinnerAddressType  
pimStarGIAssertWinnerAddress  
pimStarGIAssertWinnerMetricPref  
pimStarGIAssertWinnerMetric  
pimSGTable  
pimSGEntry  
pimSGAddressType  
pimSGGrpAddress  
pimSGSrcAddress  
pimSGUpTime  
pimSGPimMode  
pimSGUpstreamJoinState  
pimSGUpstreamJoinTimer  
pimSGUpstreamNeighbor  
pimSGRPFIIfIndex  
pimSGRPFNextHopType  
pimSGRPFNextHop  
pimSGRPFRouteProtocol  
pimSGRPFRouteAddress  
pimSGRPFRoutePrefixLength  
pimSGRPFRouteMetricPref  
pimSGRPFRouteMetric  
pimSGSPTBit  
pimSGKeepaliveTimer  
pimSGDRRegisterState  
pimSGDRRegisterStopTimer

pimSGRPRegisterPMBRAAddressType  
pimSGRPRegisterPMBRAAddress  
pimSGITable  
pimSGIEntry  
pimSGIIIfIndex  
pimSGIUpTime  
pimSGILocalMembership  
pimSGIJoinPruneState  
pimSGIPrunePendingTimer  
pimSGIJoinExpiryTimer  
pimSGIAssertState

pimSGIAssertTimer  
pimSGIAssertWinnerAddressType  
pimSGIAssertWinnerAddress  
pimSGIAssertWinnerMetricPref  
pimSGIAssertWinnerMetric  
pimSGRptTable  
pimSGRptEntry  
pimSGRptSrcAddress  
pimSGRptUpTime  
pimSGRptUpstreamPruneState  
pimSGRptUpstreamOverrideTimer  
pimSGRptITable  
pimSGRptIEntry  
pimSGRptIIIfIndex  
pimSGRptIUpTime  
pimSGRptILocalMembership  
pimSGRptIJoinPruneState  
pimSGRptIPrunePendingTimer  
pimSGRptIPruneExpiryTimer  
pimBidirDFElectionTable  
pimBidirDFElectionEntry  
pimBidirDFElectionAddressType  
pimBidirDFElectionRPAddress  
pimBidirDFElectionIfIndex  
pimBidirDFElectionWinnerAddressType  
pimBidirDFElectionWinnerAddress  
pimBidirDFElectionWinnerUpTime  
pimBidirDFElectionWinnerMetricPref  
pimBidirDFElectionWinnerMetric  
pimBidirDFElectionState  
pimBidirDFElectionStateTimer  
pimStaticRPTable  
pimStaticRPEntry  
pimStaticRPAddressType  
pimStaticRPGrpAddress  
pimStaticRPGrpPrefixLength  
pimStaticRPRPAddress

pimStaticRPPimMode  
pimStaticRPOVERRIDEdynamic  
pimStaticRPRowStatus  
pimStaticRPPrecedence

pimAnycastRPSetTable  
pimAnycastRPSetEntry  
pimAnycastRPSetAddressType  
pimAnycastRPSetAnycastAddress  
pimAnycastRPSetRouterAddress  
pimAnycastRPSetRowStatus  
pimAnycastRPSetLocalRouter  
pimGroupMappingTable  
pimGroupMappingEntry  
pimGroupMappingOrigin  
pimGroupMappingAddressType  
pimGroupMappingGrpAddress  
pimGroupMappingGrpPrefixLength  
pimGroupMappingRPAddress  
pimGroupMappingPimMode  
pimGroupMappingPrecedence  
pimUnexpectedRegisterAddressType  
pimUnexpectedRegisterOrigin  
pimUnexpectedRegisterGroup  
pimUnexpectedRegisterRp  
pimUnexpectedJoinPruneAddressType  
pimUnexpectedJoinPruneOrigin  
pimUnexpectedJoinPruneGroup  
pimUnexpectedJoinPruneRp  
pimRPMMappingChangeType

SNMP versions prior to SNMPv3 did not include adequate security. 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 module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [\[RFC3410\], section 8](#)), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module 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.

## 6. IANA Considerations

PIM-STD-MIB should be rooted under the mib-2 subtree. IANA is requested to assign { mib-2 XXX } to the PIM-STD-MIB module specified in this document.

## 7. Acknowledgements

This MIB module is based on the original work in [RFC 2934](#) [[RFC2934](#)] by K. McCloghrie, D. Farinacci, D. Thaler and W. Fenner and has been updated based on feedback from the IETF's Protocol Independent Multicast (PIM) Working Group.

Jonathan Nicholas was the editor of early versions of this document.

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Sivaramu, et al.

Expires April 7, 2006

[Page 75]

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Internet-Draft

PIM MIB

October 2005

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Sivaramu, et al.

Expires April 7, 2006

[Page 76]

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Internet-Draft

PIM MIB

October 2005

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