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R. Sivaramu
Cisco Systems
J. Lingard
Arastra, Inc
D. McWalter
Data Connection Ltd
B. Joshi
Infosys Technologies Ltd
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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

Internet-Draft

PIM MIB

March 2007

Protocol Independent Multicast (PIM) protocols (PIM-SM, BIDIR-PIM and PIM-DM). 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

1.	Introduction	3
2.	Terminology	3
3.	The Internet-Standard Management Framework	3
4.	Overview	4
5.	Definitions	5
6.	Security Considerations	82
7.	IANA Considerations	89
8.	Acknowledgements	90
9.	References	90
9.1	Normative References	90
9.2	Informative References	91
	Authors' Addresses	92
	Intellectual Property and Copyright Statements	93

Internet-Draft

PIM MIB

March 2007

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 [[RFC4601](#)], BIDIR-PIM [[I-D.ietf-pim-bidir](#)] and PIM-DM [[RFC3973](#)]).

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 retains limited support for managing PIM-DM [[RFC3973](#)], but that is no longer its primary purpose.
- 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 [[RFC4610](#)].

2. Terminology

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](#)].

[3.](#) 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).

Sivaramu, et al.

Expires September 3, 2007

[Page 3]

Internet-Draft

PIM MIB

March 2007

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](#)].

[4.](#) 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 [[RTPROTO](#)].

[5.](#) Definitions

PIM-STD-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, mib-2,
NOTIFICATION-TYPE, Unsigned32,

Counter32, Counter64, Gauge32, TimeTicks	FROM SNMPv2-SMI	-- [RFC2578]
TEXTUAL-CONVENTION, RowStatus, TruthValue, StorageType	FROM SNMPv2-TC	-- [RFC2579]
MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP	FROM SNMPv2-CONF	-- [RFC2580]
InterfaceIndexOrZero, InterfaceIndex	FROM IF-MIB	-- [RFC2863]
InetAddressType, InetAddressPrefixLength, InetAddress, InetVersion	FROM INET-ADDRESS-MIB	-- [RFC4001]
IANAipRouteProtocol	FROM IANA-RTPROTO-MIB;	-- [RTPROTO]

pimStdMIB MODULE-IDENTITY

LAST-UPDATED "200703020000Z" -- 2 March 2007

ORGANIZATION

"IETF Protocol Independent Multicast (PIM) Working Group"

CONTACT-INFO

"Email: pim@ietf.org

WG charter:

<http://www.ietf.org/html.charters/pim-charter.html>"

DESCRIPTION

"The MIB module for management of PIM routers.

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Sivaramu, et al.

Expires September 3, 2007

[Page 5]

Internet-Draft

PIM MIB

March 2007

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 "200703020000Z" -- 2 March 2007

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

--

-- 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 3596](#), [RFC 3956](#) and 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
--

pimNotifications OBJECT IDENTIFIER ::= { pimStdMIB 0 }
pim OBJECT IDENTIFIER ::= { pimStdMIB 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. It is called the SourceLifetime in the PIM-DM specification.

The storage type of this object is determined by pimDeviceConfigStorageType."


```
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.

The storage type of this object is determined by
pimDeviceConfigStorageType."

```
REFERENCE   "RFC 4601 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 }

pimOutAsserts OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of Asserts sent by this router.

Discontinuities in the value of this counter can occur at re-initialization of the management system, for example when the device is rebooted."

REFERENCE "[RFC 4601 section 4.6](#)"

::= { pim 22 }

pimInAsserts OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of Asserts received by this router. Asserts are multicast to all routers on a network. This counter is incremented by all routers that receive an assert, not only those routers that are contesting the assert."

Internet-Draft

PIM MIB

March 2007

re-initialization of the management system, for example
when the device is rebooted."

REFERENCE "[RFC 4601 section 4.6](#)"

::= { pim 23 }

pimLastAssertInterface OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The interface on which this router most recently sent or
received an assert, or zero if this router has not sent or
received an assert."

REFERENCE "[RFC 4601 section 4.6](#)"

::= { pim 24 }

pimLastAssertGroupAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type of the multicast group address in the most
recently sent or received assert. If this router has not
sent or received an assert then this object is set to
unknown(0)."

::= { pim 25 }

pimLastAssertGroupAddress OBJECT-TYPE

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

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The multicast group address in the most recently sent or
received assert. The InetAddressType is given by the
pimLastAssertGroupAddressType object."

::= { pim 26 }

pimLastAssertSourceAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The address type of the multicast source address in the most recently sent or received assert. If the most recent assert was (*,G), or if this router has not sent or received an assert, then this object is set to unknown(0)."
 ::= { pim 27 }

Sivaramu, et al.

Expires September 3, 2007

[Page 10]

Internet-Draft

PIM MIB

March 2007

pimLastAssertSourceAddress OBJECT-TYPE
 SYNTAX InetAddress (SIZE (0|4|8|16|20))
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The multicast source address in the most recently sent or received assert. The InetAddressType is given by the pimLastAssertSourceAddressType object."
 ::= { pim 28 }

pimNeighborLossNotificationPeriod OBJECT-TYPE
 SYNTAX Unsigned32 (0..65535)
 UNITS "seconds"
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "The minimum time that must elapse between pimNeighborLoss notifications originated by this router. The maximum value 65535 represents an 'infinite' time, in which case no pimNeighborLoss notifications are ever sent.
 The storage type of this object is determined by pimDeviceConfigStorageType."
 DEFVAL { 0 }
 ::= { pim 29 }

pimNeighborLossCount OBJECT-TYPE
 SYNTAX Counter32
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The number of neighbor loss events that have occurred.

This counter is incremented 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.

This counter is incremented whenever a pimNeighborLoss notification would be generated.

Discontinuities in the value of this counter can occur at re-initialization of the management system, for example when the device is rebooted."

REFERENCE "[RFC 4601 section 4.3.2](#)"

::= { pim 30 }

pimInvalidRegisterNotificationPeriod OBJECT-TYPE

SYNTAX Unsigned32 (10..65535)

Sivaramu, et al.

Expires September 3, 2007

[Page 11]

Internet-Draft

PIM MIB

March 2007

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The minimum time that must elapse between pimInvalidRegister notifications originated by this router. The default value of 65535 represents an 'infinite' time, in which case no pimInvalidRegister notifications are ever sent.

The non-zero minimum allowed value provides resilience against propagation of denial-of-service attacks from the data and control planes to the network management plane.

The storage type of this object is determined by pimDeviceConfigStorageType."

DEFVAL { 65535 }

::= { pim 31 }

pimInvalidRegisterMsgsRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of invalid PIM Register messages that have been

received by this device.

A PIM Register message is invalid if either

- o the destination address of the Register message does not match the Group to RP mapping on this device, or
- o this device believes the group address to be within an SSM address range, but this Register implies ASM usage.

These conditions can occur transiently while RP mapping changes propagate through the network. If this counter is incremented repeatedly over several minutes, then there is a persisting configuration error that requires correction.

The active Group to RP mapping on this device is specified by the object pimGroupMappingPimMode. If there is no such mapping, then the object pimGroupMappingPimMode is absent. The RP address contained in the invalid Register is pimInvalidRegisterRp.

Multicast data carried by invalid Register messages is discarded. The discarded data is from a source directly

connected to pimInvalidRegisterOrigin, and is addressed to pimInvalidRegisterGroup.

Discontinuities in the value of this counter can occur at re-initialization of the management system, for example when the device is rebooted."

REFERENCE "[RFC 4601 section 4.4.2](#), [RFC 3569](#) and
I-D.ietf-mboned-ip-mcast-mib ipMcastSsmRangeTable"
::= { pim 32 }

pimInvalidRegisterAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type stored in pimInvalidRegisterOrigin,
pimInvalidRegisterGroup and pimInvalidRegisterRp.

If no unexpected Register messages have been received, then
 this object is set to unknown(0)."
 ::= { pim 33 }

pimInvalidRegisterOrigin 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."
 ::= { pim 34 }

pimInvalidRegisterGroup 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."
 ::= { pim 35 }

pimInvalidRegisterRp 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."
 ::= { pim 36 }

pimInvalidJoinPruneNotificationPeriod OBJECT-TYPE

SYNTAX Unsigned32 (10..65535)
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The minimum time that must elapse between
 pimInvalidJoinPrune notifications originated by this router.
 The default value of 65535 represents an 'infinite' time, in
 which case no pimInvalidJoinPrune notifications are ever
 sent."

The non-zero minimum allowed value provides resilience against propagation of denial-of-service attacks from the control plane to the network management plane.

The storage type of this object is determined by `pimDeviceConfigStorageType`."

DEFVAL { 65535 }
 ::= { pim 37 }

`pimInvalidJoinPruneMsgsRcvd` OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of invalid PIM Join/Prune messages that have been received by this device.

A PIM Join/Prune message is invalid if either

- o the Group to RP mapping specified by this message does not match the Group to RP mapping on this device, or

- o this device believes the group address to be within an SSM address range, but this Join/Prune (*,G) or (S,G,rpt) implies ASM usage.

These conditions can occur transiently while RP mapping changes propagate through the network. If this counter is incremented repeatedly over several minutes, then there is a persisting configuration error that requires correction.

The active Group to RP mapping on this device is specified by the object `pimGroupMappingPimMode`. If there is no such mapping, then the object `pimGroupMappingPimMode` is absent. The RP address contained in the invalid Join/Prune is `pimInvalidJoinPruneRp`.

Invalid Join/Prune messages are discarded. This may result in loss of multicast data affecting listeners downstream of `pimInvalidJoinPruneOrigin`, for multicast data addressed to `pimInvalidJoinPruneGroup`.

Discontinuities in the value of this counter can occur at re-initialization of the management system, for example when the device is rebooted."

REFERENCE "[RFC 4601 section 4.5.2](#), [RFC 3569](#) and
I-D.ietf-mboned-ip-mcast-mib ipMcastSsmRangeTable"
::= { pim 38 }

pimInvalidJoinPruneAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address type stored in pimInvalidJoinPruneOrigin, pimInvalidJoinPruneGroup and pimInvalidJoinPruneRp.

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

::= { pim 39 }

pimInvalidJoinPruneOrigin 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."

::= { pim 40 }

pimInvalidJoinPruneGroup 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."

::= { pim 41 }

pimInvalidJoinPruneRp 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."
 ::= { pim 42 }

pimRPMappingNotificationPeriod OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The minimum time that must elapse between
 pimRPMappingChange notifications originated by this router.
 The default value of 65535 represents an 'infinite' time, in
 which case no pimRPMappingChange notifications are ever
 sent.

 The storage type of this object is determined by
 pimDeviceConfigStorageType."
DEFVAL { 65535 }
 ::= { pim 43 }

pimRPMappingChangeCount OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of changes to active RP mappings on this device.

 Information about active RP mappings is available in
 pimGroupMappingTable. Only changes to active mappings cause
 this counter to be incremented. That is, changes that
 modify the pimGroupMappingEntry with the highest precedence
 for a group (lowest value of pimGroupMappingPrecedence).

 Such changes may result from manual configuration of this
 device, or from automatic RP mapping discovery methods
 including the PIM Bootstrap Router (BSR) mechanism.

 Discontinuities in the value of this counter can occur at
 re-initialization of the management system, for example
 when the device is rebooted."
REFERENCE "I-D.ietf-pim-sm-bsr"
 ::= { pim 44 }

pimInterfaceElectionNotificationPeriod OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)
UNITS "seconds"
MAX-ACCESS read-write

STATUS current

Sivaramu, et al.

Expires September 3, 2007

[Page 16]

Internet-Draft

PIM MIB

March 2007

DESCRIPTION

"The minimum time that must elapse between pimInterfaceElection notifications originated by this router. The default value of 65535 represents an 'infinite' time, in which case no pimInterfaceElection notifications are ever sent.

The storage type of this object is determined by pimDeviceConfigStorageType."

DEFVAL { 65535 }

::= { pim 45 }

pimInterfaceElectionWinCount OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times this device has been elected DR or DF on any interface.

Elections occur frequently on newly-active interfaces, as triggered Hellos establish adjacencies. This counter is not incremented for elections on an interface until the first periodic Hello has been sent. If this router is the DR or DF at the time of sending the first periodic Hello after interface activation, then this counter is incremented (once) at that time.

Discontinuities in the value of this counter can occur at re-initialization of the management system, for example when the device is rebooted."

REFERENCE "[RFC 4601 section 4.3.2](#) and
I-D.ietf-pim-bidir [section 3.5.2](#)"

::= { pim 46 }

pimRefreshInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The interval between successive State Refresh messages sent by an Originator. This timer period is called the RefreshInterval in the PIM-DM specification. This object is used only by PIM-DM.

The storage type of this object is determined by pimDeviceConfigStorageType."

Sivaramu, et al.

Expires September 3, 2007

[Page 17]

Internet-Draft

PIM MIB

March 2007

REFERENCE "[RFC 3973 section 4.8](#)"

DEFVAL { 60 }

::= { pim 47 }

pimDeviceConfigStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The storage type used for the global PIM configuration of this device, comprised of the objects listed below. If this storage type takes the value 'permanent', write-access to the listed objects need not be allowed.

The objects described by this storage type are:
pimKeepalivePeriod, pimRegisterSuppressionTime,
pimNeighborLossNotificationPeriod,
pimInvalidRegisterNotificationPeriod,
pimInvalidJoinPruneNotificationPeriod,
pimRPMMappingNotificationPeriod,
pimInterfaceElectionNotificationPeriod and
pimRefreshInterval."

DEFVAL { nonVolatile }

::= { pim 48 }

--

-- 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,
pimInterfaceGenerationIDValue	Unsigned32,
pimInterfaceDR	InetAddress,
pimInterfaceDRPriority	Unsigned32,
pimInterfaceDRPriorityEnabled	TruthValue,
pimInterfaceHelloInterval	Unsigned32,
pimInterfaceTrigHelloInterval	Unsigned32,
pimInterfaceHelloHoldtime	Unsigned32,
pimInterfaceJoinPruneInterval	Unsigned32,
pimInterfaceJoinPruneHoldtime	Unsigned32,
pimInterfaceDFElectionRobustness	Unsigned32,
pimInterfaceLanDelayEnabled	TruthValue,
pimInterfacePropagationDelay	Unsigned32,
pimInterfaceOverrideInterval	Unsigned32,
pimInterfaceEffectPropagDelay	Unsigned32,
pimInterfaceEffectOverrideIvl	Unsigned32,
pimInterfaceSuppressionEnabled	TruthValue,
pimInterfaceBidirCapable	TruthValue,
pimInterfaceDomainBorder	TruthValue,
pimInterfaceStubInterface	TruthValue,
pimInterfacePruneLimitInterval	Unsigned32,
pimInterfaceGraftRetryInterval	Unsigned32,

pimInterfaceSRPriorityEnabled	TruthValue,
pimInterfaceStatus	RowStatus,
pimInterfaceStorageType	StorageType

}

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."
 REFERENCE "[RFC 4601](#) sections [4.1.6](#), [4.3.1-4.3.4](#) and [4.5.1](#)"

```
::= { pimInterfaceEntry 4 }
```

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."

REFERENCE "[RFC 4601 section 4.3.1](#)"

```
::= { pimInterfaceEntry 5 }
```

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."

REFERENCE "[RFC 4601 section 4.3](#)"

```
::= { pimInterfaceEntry 6 }
```

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."

REFERENCE "[RFC 4601 section 4.3.2](#)"

DEFVAL { 1 }

```
::= { pimInterfaceEntry 7 }
```

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."
REFERENCE "[RFC 4601 section 4.3.2](#)"
 ::= { pimInterfaceEntry 8 }

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 "[RFC 4601 section 9](#)"

DEFVAL { 30 }

::= { pimInterfaceEntry 9 }

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 "[RFC 4601 section 4.11](#)"

DEFVAL { 5 }

::= { pimInterfaceEntry 10 }

pimInterfaceHelloHoldtime OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-create

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."

REFERENCE "[RFC 4601](#) sections [4.3.2](#) and [4.9.2](#)"

DEFVAL { 105 }

::= { pimInterfaceEntry 11 }

pimInterfaceJoinPruneInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..18000)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"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 "[RFC 4601 section 4.11](#)"

DEFVAL { 60 }

::= { pimInterfaceEntry 12 }

pimInterfaceJoinPruneHoldtime OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-create

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. PIM-DM implementations are recommended to use the value of pimInterfacePruneLimitInterval."

REFERENCE "[RFC 4601](#) sections [4.5.3](#) and [4.9.5](#)"

DEFVAL { 210 }

::= { pimInterfaceEntry 13 }

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 14 }

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."

REFERENCE "[RFC 4601](#) sections [4.3.3](#) and [4.9.2](#)"

::= { pimInterfaceEntry 15 }

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 16 }

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

Internet-Draft

PIM MIB

March 2007

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 "[RFC 4601 section 4.3.3](#)"

DEFVAL { 2500 }

::= { pimInterfaceEntry 17 }

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."

REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimInterfaceEntry 18 }

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."

REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimInterfaceEntry 19 }

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."
REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimInterfaceEntry 20 }

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."
REFERENCE "I-D.ietf-pim-bidir [section 3.2](#) and 3.7.4"
::= { 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 }

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 (Internet Group

Management Protocol) or MLD (Multicast Listener Discovery) only, which protects 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."

REFERENCE "[RFC 3376](#), [RFC 3810](#)"

DEFVAL { false }

::= { pimInterfaceEntry 23 }

Sivaramu, et al.

Expires September 3, 2007

[Page 25]

Internet-Draft

PIM MIB

March 2007

pimInterfacePruneLimitInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The minimum interval that must transpire between two successive Prunes sent by a router. This object corresponds to the 't_limit' timer value defined in the PIM-DM specification. This object is used only by PIM-DM."

REFERENCE "[RFC 3973 section 4.8](#)"

DEFVAL { 60 }

::= { pimInterfaceEntry 24 }

pimInterfaceGraftRetryInterval OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The minimum interval that must transpire between two successive Grafts sent by a router. This object corresponds to the 'Graft_Retry_Period' timer value defined in the PIM-DM specification. This object is used only by PIM-DM."

REFERENCE "[RFC 3973 section 4.8](#)"

DEFVAL { 3 }

::= { pimInterfaceEntry 25 }

pimInterfaceSRPriorityEnabled OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Evaluates to TRUE if all routers on this interface are using the State Refresh option. This object is used only by PIM-DM."

::= { pimInterfaceEntry 26 }

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

Sivaramu, et al.

Expires September 3, 2007

[Page 26]

Internet-Draft

PIM MIB

March 2007

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 27 }

pimInterfaceStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The storage type for this row. Rows having the value 'permanent' need not allow write-access to any columnar objects in the row."

DEFVAL { nonVolatile }

::= { pimInterfaceEntry 28 }

--

-- 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,
                  pimNeighborAddressType,
                  pimNeighborAddress }
    ::= { pimNeighborTable 1 }

```

```

PimNeighborEntry ::= SEQUENCE {
    pimNeighborIfIndex      InterfaceIndex,
    pimNeighborAddressType  InetAddressType,
    pimNeighborAddress      InetAddress,
    pimNeighborGenerationIDPresent TruthValue,
    pimNeighborGenerationIDValue  Unsigned32,
    pimNeighborUpTime        TimeTicks,
    pimNeighborExpiryTime     TimeTicks,

```

```

    pimNeighborDRPriorityPresent TruthValue,
    pimNeighborDRPriority        Unsigned32,
    pimNeighborLanPruneDelayPresent TruthValue,
    pimNeighborTBit              TruthValue,
    pimNeighborPropagationDelay  Unsigned32,
    pimNeighborOverrideInterval Unsigned32,
    pimNeighborBidirCapable      TruthValue,
    pimNeighborSRCapable         TruthValue
}

```

```

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 }

pimNeighborGenerationIDPresent OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

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

REFERENCE "[RFC 4601 section 4.3.1](#)"

::= { pimNeighborEntry 4 }

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."

REFERENCE "[RFC 4601 section 4.3.1](#)"

::= { pimNeighborEntry 5 }

pimNeighborUpTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time since this PIM neighbor (last) became a neighbor of the local router."

::= { pimNeighborEntry 6 }

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 7 }

pimNeighborDRPriorityPresent OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Evaluates to TRUE if this neighbor is using the DR Priority option."

REFERENCE "[RFC 4601 section 4.3.2](#)"

::= { pimNeighborEntry 8 }

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."

REFERENCE "[RFC 4601 section 4.3.2](#)"

::= { pimNeighborEntry 9 }

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."

REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimNeighborEntry 10 }

pimNeighborTBit OBJECT-TYPE

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."

REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimNeighborEntry 11 }

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."

REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimNeighborEntry 12 }

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."

REFERENCE "[RFC 4601 section 4.3.3](#)"

::= { pimNeighborEntry 13 }

pimNeighborBidirCapable OBJECT-TYPE

Internet-Draft

PIM MIB

March 2007

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Evaluates to TRUE if this neighbor is using the
 Bidirectional-PIM Capable option."
REFERENCE "I-D.ietf-pim-bidir [section 3.2](#) and 3.7.4"
 ::= { pimNeighborEntry 14 }

pimNeighborSRCapable OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Evaluates to TRUE if this neighbor is using the State
 Refresh Capable option. This object is used only by
 PIM-DM."
REFERENCE "[RFC 3973 section 4.3.4](#)"
 ::= { pimNeighborEntry 15 }

--
-- 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)."
REFERENCE "[RFC 4601 section 4.3.4](#)"
 ::= { 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 {
```

Sivaramu, et al.

Expires September 3, 2007

[Page 31]

Internet-Draft

PIM MIB

March 2007

```
    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

Sivaramu, et al. Expires September 3, 2007 [Page 32]

Internet-Draft

PIM MIB

March 2007

```

SYNTAX      SEQUENCE OF PimStarGEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The (conceptual) table listing the non-interface specific
    (*,G) state that PIM has."
REFERENCE   "RFC 4601 section 4.1.3"
 ::= { 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,
pimStarGUpstreamNeighborType	InetAddressType,
pimStarGUpstreamNeighbor	InetAddress,
pimStarGRPFIIfIndex	InterfaceIndexOrZero,
pimStarGRPFPNextHopType	InetAddressType,
pimStarGRPFPNextHop	InetAddress,
pimStarGRPFRouteProtocol	IANAipRouteProtocol,
pimStarGRPFRouteAddress	InetAddress,
pimStarGRPFRoutePrefixLength	InetAddressPrefixLength,
pimStarGRPFRouteMetricPref	Unsigned32,
pimStarGRPFRouteMetric	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

Sivaramu, et al. Expires September 3, 2007 [Page 34]

Internet-Draft PIM MIB March 2007

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
 "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 "[RFC 4601 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 "[RFC 4601 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 "[RFC 4601 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 "[RFC 4601 section 4.5.5](#)"

::= { pimStarGEntry 15 }

pimStarGRPFRouteProtocol OBJECT-TYPE

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
 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 pimStarGRPFPNextHopType
 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 pimStarGRPFPNextHopType
 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
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the interface-specific (*,G)
        state that PIM has."
    REFERENCE   "RFC 4601 section 4.1.3"
    ::= { 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

Sivaramu, et al.

Expires September 3, 2007

[Page 38]

Internet-Draft

PIM MIB

March 2007

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 ["RFC 3376, RFC 3810, RFC 4601 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 "[RFC 4601 section 4.5.2](#)"
::= { pimStarGIEntry 4 }

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

Sivaramu, et al.

Expires September 3, 2007

[Page 39]

Internet-Draft

PIM MIB

March 2007

"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 "[RFC 4601 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 "[RFC 4601 section 4.10](#)"
::= { pimStarGIEntry 6 }

pimStarGIAssertState 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 "[RFC 4601 section 4.6.2](#)"

::= { pimStarGIEntry 7 }

pimStarGIAssertTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If pimStarGIAssertState is 'iAmAssertWinner', this is the time remaining before the local router next sends a (*,G) Assert message on this interface. If pimStarGIAssertState is 'iAmAssertLoser', this is the time remaining before the (*,G) Assert state expires. If pimStarGIAssertState is

Sivaramu, et al.

Expires September 3, 2007

[Page 40]

Internet-Draft

PIM MIB

March 2007

'noInfo', this is zero. This timer is called the (*,G) Assert Timer in the PIM-SM specification."

REFERENCE "[RFC 4601 section 4.6.2](#)"

::= { pimStarGIEntry 8 }

pimStarGIAssertWinnerAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

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

::= { pimStarGIEntry 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."

::= { pimStarGIEntry 10 }

```
pimStarGIAAssertWinnerMetricPref OBJECT-TYPE
    SYNTAX      Unsigned32 (0..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "If pimStarGIAAssertState 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 }
```

```
pimStarGIAAssertWinnerMetric OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "If pimStarGIAAssertState 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
--
```

Sivaramu, et al. Expires September 3, 2007 [Page 41]

Internet-Draft PIM MIB March 2007

```
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."
    REFERENCE  "RFC 4601 section 4.1.4"
    ::= { pim 6 }
```

```
pimSGEntry OBJECT-TYPE
    SYNTAX      PimSGEntry
    MAX-ACCESS  not-accessible
    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,
    pimSGUpstreamPruneState    INTEGER,
    pimSGUpstreamPruneLimitTimer TimeTicks,
    pimSGOriginatorState      INTEGER,
    pimSGSourceActiveTimer     TimeTicks,

```

```

    pimSGStateRefreshTimer    TimeTicks
}

```

```

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."
    REFERENCE  "RFC 4601 section 4.5.2, RFC 3569 and
        I-D.ietf-mboned-ip-mcast-mib ipMcastSsmRangeTable"

```

```

::= { 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 "RFC 4601 section 4.5.7"
::= { pimSGEntry 6 }

```

pimSGUpstreamJoinTimer OBJECT-TYPE

```

SYNTAX      TimeTicks
MAX-ACCESS read-only
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 "RFC 4601 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 "RFC 4601 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 "[RFC 4601 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."

Internet-Draft

PIM MIB

March 2007

::= { 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

Sivaramu, et al.

Expires September 3, 2007

[Page 46]

Internet-Draft

PIM MIB

March 2007

it, this (S,G) state expires. This timer is called the (S,G) Keepalive Timer in the PIM-SM specification."

REFERENCE "[RFC 4601 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 "[RFC 4601 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 "[RFC 4601 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 }

Sivaramu, et al.

Expires September 3, 2007

[Page 47]

Internet-Draft

PIM MIB

March 2007

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 }

pimSGUpstreamPruneState OBJECT-TYPE

SYNTAX INTEGER {
 forwarding (1),
 ackpending (2),
 pruned (3)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the local router has pruned itself from the tree. This corresponds to the state of the upstream prune (S,G) state machine in the PIM-DM specification. This object is used only by PIM-DM."

REFERENCE "[RFC 3973 section 4.4.1](#)"

::= { pimSGEntry 23 }

pimSGUpstreamPruneLimitTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time remaining before the local router may send a (S,G) Prune message on pimSGRPFIfIndex. This timer is called the (S,G) Prune Limit Timer in the PIM-DM specification. This object is zero if the timer is not running. This object is used only by PIM-DM."

REFERENCE "[RFC 2973 section 4.8](#)"

::= { pimSGEntry 24 }

pimSGOriginatorState OBJECT-TYPE

SYNTAX INTEGER {
notOriginator (1),
originator (2)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

Sivaramu, et al.

Expires September 3, 2007

[Page 48]

Internet-Draft

PIM MIB

March 2007

"Whether the router is an originator for an (S,G) message flow. This corresponds to the state of the per-(S,G) Originator state machine in the PIM-DM specification. This object is used only by PIM-DM."

REFERENCE "[RFC 3973 section 4.5.2](#)"

::= { pimSGEntry 25 }

pimSGSourceActiveTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If pimSGOriginatorState is 'originator', this is the time remaining before the local router reverts to a notOriginator state. Otherwise, this is zero. This timer is called the Source Active Timer in the PIM-DM specification. This object is used only by PIM-DM."

REFERENCE "[RFC 3973 section 4.8](#)"

::= { pimSGEntry 26 }

pimSGStateRefreshTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If pimSGOriginatorState is 'originator', this is the time remaining before the local router sends a State Refresh message. Otherwise, this is zero. This timer is called the State Refresh Timer in the PIM-DM specification. This object is used only by PIM-DM."

REFERENCE "[RFC 3973 section 4.8](#)"

::= { pimSGEntry 27 }

--

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

--

pimSGITable OBJECT-TYPE

SYNTAX SEQUENCE OF PimSGIEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

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

REFERENCE "[RFC 4601 section 4.1.4](#)"

::= { pim 7 }

pimSGIEntry OBJECT-TYPE

Sivaramu, et al.

Expires September 3, 2007

[Page 49]

Internet-Draft

PIM MIB

March 2007

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 {

pimSGIIIfIndex	InterfaceIndex,
pimSGIUpTime	TimeTicks,
pimSGILocalMembership	TruthValue,
pimSGIJoinPruneState	INTEGER,
pimSGIPrunePendingTimer	TimeTicks,
pimSGIJoinExpiryTimer	TimeTicks,
pimSGIAssertState	INTEGER,
pimSGIAssertTimer	TimeTicks,
pimSGIAssertWinnerAddressType	InetAddressType,
pimSGIAssertWinnerAddress	InetAddress,
pimSGIAssertWinnerMetricPref	Unsigned32,
pimSGIAssertWinnerMetric	Unsigned32

}

pimSGIIIfIndex 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 IGMP or MLD). This corresponds to local_receiver_include(S,G,I) in the PIM-SM specification."

REFERENCE "[RFC 3376](#), [RFC 3810](#), [RFC 4601](#) sections [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 and PIM-DM specification."

REFERENCE "[RFC 4601 section 4.5.3](#) and [RFC 3973 section 4.4.2](#)"

::= { 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 "[RFC 4601 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. This timer is called the

(S,G) Prune Timer in the PIM-DM specification."
REFERENCE "[RFC 4601 section 4.10](#) and [RFC 3973 section 4.8](#)"
::= { 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 "[RFC 4601 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 "[RFC 4601 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

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

MAX-ACCESS read-only

STATUS current

Internet-Draft

PIM MIB

March 2007

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) StateTable

--

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."

REFERENCE [RFC 4601 section 4.1.5](#)

::= { pim 8 }

pimSGRptEntry OBJECT-TYPE

SYNTAX PimSGRptEntry

```

MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "An entry (conceptual row) in the pimSGRptTable."
INDEX       { pimStarGAddressType,
              pimStarGGrpAddress,

```

Sivaramu, et al.

Expires September 3, 2007

[Page 53]

Internet-Draft

PIM MIB

March 2007

```

        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 "[RFC 4601 section 4.5.9](#)"

::= { pimSGRptEntry 3 }

pimSGRptUpstreamOverrideTimer OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

Sivaramu, et al.

Expires September 3, 2007

[Page 54]

Internet-Draft

PIM MIB

March 2007

"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 "[RFC 4601 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."

REFERENCE "[RFC 4601 section 4.1.5](#)"

::= { 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

```

Sivaramu, et al.

Expires September 3, 2007

[Page 55]

Internet-Draft

PIM MIB

March 2007

```

        "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 IGMP or MLD).
        This corresponds to local_receiver_exclude(S,G,I) in the

```

PIM-SM specification."
REFERENCE "[RFC 3376](#), [RFC 3810](#), [RFC 4601 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 "[RFC 4601 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 "[RFC 4601 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 "RFC 4601 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."
    REFERENCE "I-D.ietf-pim-bidir section 3.5"
    ::= { 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 }

pimBidirDFElectionWinnerAddress OBJECT-TYPE

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
 pimBidirDFElectionWinnerAddressType 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

Internet-Draft

PIM MIB

March 2007

```
        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."
    REFERENCE  "RFC 4601 section 3.7"
    ::= { 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,
```

Sivaramu, et al.

Expires September 3, 2007

[Page 60]

Internet-Draft

PIM MIB

March 2007

```
    pimStaticRPGrpPrefixLength  InetAddressPrefixLength,  
    pimStaticRPRPAddress        InetAddress,  
    pimStaticRPPimMode          PimMode,  
    pimStaticRPOverrideDynamic  TruthValue,  
    pimStaticRPPrecedence       Unsigned32,  
    pimStaticRPRowStatus        RowStatus,  
    pimStaticRPStorageType      StorageType  
}
```

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."

```
::= { pimStaticRPEntry 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."
 ::= { pimStaticRPEntry 3 }

pimStaticRPRPAddress OBJECT-TYPE

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."
 ::= { pimStaticRPEntry 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."
 REFERENCE "[RFC 4601 section 3.7](#), [RFC 3569](#) and
 I-D.ietf-mboned-ip-mcast-mib ipMcastSsmRangeTable"
 DEFVAL { asm }
 ::= { pimStaticRPEntry 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 }

::= { pimStaticRPEntry 6 }

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 pimStaticRPOverrideDynamic is set to TRUE, all dynamic RP configuration is overridden by this static configuration,

whatever the value of this object.

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 7 }

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 a valid value has been written to pimStaticRPRPAddress.

All writeable objects in this entry can be modified when the status of this entry is active(1)."
 ::= { pimStaticRPEntry 8 }

pimStaticRPStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The storage type for this row. Rows having the value 'permanent' need not allow write-access to any columnar objects in the row."

DEFVAL { nonVolatile }

::= { pimStaticRPEntry 9 }

--

-- 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 (Multicast Source Discovery Protocol).

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 "[RFC 4610](#), [RFC 3618](#)"

::= { 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,

pimAnycastRPSetLocalRouter TruthValue,

pimAnycastRPSetRowStatus RowStatus,

pimAnycastRPSetStorageType StorageType

}

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 }

pimAnycastRPSetLocalRouter OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Whether this entry corresponds to the local router."
 ::= { pimAnycastRPSetEntry 4 }

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.

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

```
        status of this entry is active(1)."
::= { pimAnycastRPSetEntry 5 }
```

```
pimAnycastRPSetStorageType OBJECT-TYPE
```

```
    SYNTAX      StorageType
```

```
    MAX-ACCESS  read-create
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "The storage type for this row.  Rows having the value
        'permanent' need not allow write-access to any columnar
        objects in the row."
```

```
    DEFVAL { nonVolatile }
```

```
    ::= { pimAnycastRPSetEntry 6 }
```

```
--
```

```
-- 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 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 pimStaticRPTable 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. From the selected subset of rows, the subset that have the greatest value of `pimGroupMappingGrpPrefixLength` are selected.
4. If there are multiple selected rows, and a subset are defined by `pimStaticRPTable` (`pimGroupMappingOrigin` value of 'configRp') with `pimStaticRPOVERRIDE_DYNAMIC` set to TRUE, then this subset is selected.
5. If there are still multiple selected rows, the subset that have the highest precedence (the lowest numerical value for `pimGroupMappingPrecedence`) are selected.
6. If there are still 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 4601 section 3.7](#), [RFC 3956](#) and [RFC 4610](#)"
 ::= { 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,
 pimGroupMappingRPAddressType,
 pimGroupMappingRPAddress }

::= { pimGroupMappingTable 1 }

PimGroupMappingEntry ::= SEQUENCE {

pimGroupMappingOrigin PimGroupMappingOriginType,

pimGroupMappingAddressType InetAddressType,

pimGroupMappingGrpAddress InetAddress,

pimGroupMappingGrpPrefixLength InetAddressPrefixLength,

pimGroupMappingRPAddressType InetAddressType,

pimGroupMappingRPAddress 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 }

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

Sivaramu, et al.

Expires September 3, 2007

[Page 68]

Internet-Draft

PIM MIB

March 2007

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 }

pimGroupMappingRPAAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The address type of the RP to be used for groups within this group prefix, or unknown(0) if no RP is to be used or if the RP address is unknown. This object must be unknown(0) if pimGroupMappingPimMode is ssm(2), or if pimGroupMappingOrigin is embedded(6)."

::= { pimGroupMappingEntry 5 }

pimGroupMappingRPAddress OBJECT-TYPE

SYNTAX InetAddress (SIZE (0|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. The InetAddressType is given by the

Sivaramu, et al.

Expires September 3, 2007

[Page 69]

Internet-Draft

PIM MIB

March 2007

pimGroupMappingRPAddressType object."

::= { pimGroupMappingEntry 6 }

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 7 }

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 8 }

--
-- PIM Notifications
--

pimNeighborLoss NOTIFICATION-TYPE
    OBJECTS { pimNeighborUpTime }
    STATUS      current
    DESCRIPTION
        "A pimNeighborLoss notification signifies the loss of an
        adjacency with a neighbor. This notification 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.

        This notification is generated whenever the counter
        pimNeighborLossCount is incremented, subject
        to the rate limit specified by
        pimNeighborLossNotificationPeriod."
    REFERENCE "RFC 4601 section 4.3.2"
    ::= { pimNotifications 1 }

```

```

pimInvalidRegister NOTIFICATION-TYPE
    OBJECTS { pimGroupMappingPimMode,
        pimInvalidRegisterAddressType,
        pimInvalidRegisterOrigin,
        pimInvalidRegisterGroup,
        pimInvalidRegisterRp
    }
    STATUS      current
    DESCRIPTION
        "A pimInvalidRegister notification signifies that an invalid
        PIM Register message was received by this device.

        This notification is generated whenever the counter
        pimInvalidRegisterMsgsRcvd is incremented, subject to the
        rate limit specified by
        pimInvalidRegisterNotificationPeriod."
    REFERENCE "RFC 4601 section 4.4.2"
    ::= { pimNotifications 2 }

```



```

pimInvalidJoinPrune NOTIFICATION-TYPE
  OBJECTS { pimGroupMappingPimMode,
             pimInvalidJoinPruneAddressType,
             pimInvalidJoinPruneOrigin,
             pimInvalidJoinPruneGroup,
             pimInvalidJoinPruneRp,
             pimNeighborUpTime
          }
  STATUS      current
  DESCRIPTION
    "A pimInvalidJoinPrune notification signifies that an
    invalid PIM Join/Prune message was received by this device.

    This notification is generated whenever the counter
    pimInvalidJoinPruneMsgsRcvd is incremented, subject to the
    rate limit specified by
    pimInvalidJoinPruneNotificationPeriod."
  REFERENCE "RFC 4601 section 4.5.2"
  ::= { pimNotifications 3 }

```

```

pimRPMappingChange NOTIFICATION-TYPE
  OBJECTS { pimGroupMappingPimMode,
             pimGroupMappingPrecedence
          }
  STATUS      current
  DESCRIPTION
    "A pimRPMappingChange notification signifies a change to the
    active RP mapping on this device."

```

Sivaramu, et al. Expires September 3, 2007 [Page 71]

Internet-Draft PIM MIB March 2007

```

    This notification is generated whenever the counter
    pimRPMappingChangeCount is incremented, subject to the
    rate limit specified by
    pimRPMappingChangeNotificationPeriod."
  ::= { pimNotifications 4 }

```

```

pimInterfaceElection NOTIFICATION-TYPE
  OBJECTS { pimInterfaceAddressType,
             pimInterfaceAddress }
  STATUS      current
  DESCRIPTION

```

"A pimInterfaceElection notification signifies that a new DR or DF has been elected on a network.

This notification is generated whenever the counter pimInterfaceElectionWinCount is incremented, subject to the rate limit specified by pimInterfaceElectionNotificationPeriod."

REFERENCE "[RFC 4601 section 4.3.2](#) and
I-D.ietf-pim-bidir [section 3.5.2](#)"
::= { pimNotifications 5 }

--

-- Conformance Information

--

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

--

-- Compliance Statements

--

pimMIBComplianceAsm MODULE-COMPLIANCE
STATUS current
DESCRIPTION
 "The compliance statement for PIM-SM MIB."
MODULE -- this module
MANDATORY-GROUPS { pimTopologyGroup,
 pimSsmGroup,
 pimRPConfigGroup,
 pimSmGroup }

GROUP pimNotificationGroup
DESCRIPTION
 "This group is optional."

GROUP pimTuningParametersGroup
DESCRIPTION
 "This group is optional."

GROUP pimRouterStatisticsGroup
DESCRIPTION
 "This group is optional."

GROUP pimAnycastRpGroup
DESCRIPTION
 "This group is optional."

GROUP pimStaticRPPrecedenceGroup
DESCRIPTION
 "This group is optional."

GROUP pimNetMgmtNotificationObjects
DESCRIPTION
 "This group is optional."

GROUP pimNetMgmtNotificationGroup
DESCRIPTION
 "This group is optional."

GROUP pimDiagnosticsGroup
DESCRIPTION
 "This group is optional."

GROUP pimDeviceStorageGroup
DESCRIPTION
 "This group is optional."

::= { pimMIBCompliances 1 }

pimMIBComplianceBidir MODULE-COMPLIANCE
 STATUS current
 DESCRIPTION
 "The compliance statement for Bidir-PIM MIB."
 MODULE -- this module
 MANDATORY-GROUPS { pimTopologyGroup,
 pimRPConfigGroup,
 pimSmGroup,
 pimBidirGroup }

 GROUP pimNotificationGroup
 DESCRIPTION
 "This group is optional."

```
GROUP    pimTuningParametersGroup
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimRouterStatisticsGroup
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimAnycastRpGroup
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimStaticRPPrecedenceGroup
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimNetMgmtNotificationObjects
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimNetMgmtNotificationGroup
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimDiagnosticsGroup
DESCRIPTION
    "This group is optional."
```

```
GROUP    pimDeviceStorageGroup
DESCRIPTION
    "This group is optional."
```

```
::= { pimMIBCompliances 2 }
```

```
pimMIBComplianceSsm MODULE-COMPLIANCE
    STATUS    current
    DESCRIPTION
        "The compliance statement for PIM SSM MIB."
    MODULE -- this module
    MANDATORY-GROUPS { pimTopologyGroup,
                        pimSsmGroup }

    GROUP    pimNotificationGroup
    DESCRIPTION
        "This group is optional."

    GROUP    pimTuningParametersGroup
```

DESCRIPTION

Sivaramu, et al.

Expires September 3, 2007

[Page 74]

Internet-Draft

PIM MIB

March 2007

"This group is optional."

GROUP pimRouterStatisticsGroup
DESCRIPTION
"This group is optional."

GROUP pimNetMgmtNotificationObjects
DESCRIPTION
"This group is optional."

GROUP pimNetMgmtNotificationGroup
DESCRIPTION
"This group is optional."

GROUP pimDiagnosticsGroup
DESCRIPTION
"This group is optional."

GROUP pimDeviceStorageGroup
DESCRIPTION
"This group is optional."

::= { pimMIBCompliances 3 }

pimMIBComplianceDm MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for PIM-DM MIB."

MODULE -- this module

MANDATORY-GROUPS { pimTopologyGroup,
pimSsmGroup,
pimRPConfigGroup,
pimSmGroup,
pimDmGroup }

GROUP pimNotificationGroup
DESCRIPTION
"This group is optional."

GROUP pimTuningParametersGroup

DESCRIPTION
"This group is optional."

GROUP pimRouterStatisticsGroup
DESCRIPTION
"This group is optional."

GROUP pimAnycastRpGroup

Sivaramu, et al.

Expires September 3, 2007

[Page 75]

Internet-Draft

PIM MIB

March 2007

DESCRIPTION
"This group is optional."

GROUP pimStaticRPPrecedenceGroup
DESCRIPTION
"This group is optional."

GROUP pimNetMgmtNotificationObjects
DESCRIPTION
"This group is optional."

GROUP pimNetMgmtNotificationGroup
DESCRIPTION
"This group is optional."

GROUP pimDiagnosticsGroup
DESCRIPTION
"This group is optional."

GROUP pimDeviceStorageGroup
DESCRIPTION
"This group is optional."

::= { pimMIBCompliances 4 }

--

-- Units of Conformance

--

pimTopologyGroup OBJECT-GROUP
OBJECTS { pimInterfaceAddressType,
pimInterfaceAddress,
pimInterfaceGenerationIDValue,

```

pimInterfaceDR,
pimInterfaceDRPriorityEnabled,
pimInterfaceHelloHoldtime,
pimInterfaceJoinPruneHoldtime,
pimInterfaceLanDelayEnabled,
pimInterfaceEffectPropagDelay,
pimInterfaceEffectOverrideIvl,
pimInterfaceSuppressionEnabled,
pimInterfaceBidirCapable,
pimNeighborGenerationIDPresent,
pimNeighborGenerationIDValue,
pimNeighborUpTime,
pimNeighborExpiryTime,
pimNeighborDRPriorityPresent,
pimNeighborDRPriority,

```

```

pimNeighborLanPruneDelayPresent,
pimNeighborTBit,
pimNeighborPropagationDelay,
pimNeighborOverrideInterval,
pimNeighborBidirCapable,
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,
              pimInterfaceDRPriority,
              pimInterfaceHelloInterval,

```

```

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

```

```

pimRouterStatisticsGroup OBJECT-GROUP
    OBJECTS { pimStarGEntries,
        pimStarGIEntries,
        pimSGEntries,
        pimSGIEntries,
        pimSGRptEntries,
        pimSGRptIEntries
    }

```

```

    }
    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,

```

Sivaramu, et al. Expires September 3, 2007 [Page 78]

Internet-Draft PIM MIB March 2007

```

        pimStaticRPOVERRIDEdynamic,
        pimStaticRPRowStatus,
        pimStaticRPStorageType,
        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,
```

Sivaramu, et al.

Expires September 3, 2007

[Page 79]

Internet-Draft

PIM MIB

March 2007

```
           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 { pimAnycastRPSetLocalRouter,
 pimAnycastRPSetRowStatus,
 pimAnycastRPSetStorageType
 }

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 { pimInvalidRegisterNotificationPeriod,
          pimInvalidRegisterMsgsRcvd,
          pimInvalidRegisterAddressType,
          pimInvalidRegisterOrigin,
          pimInvalidRegisterGroup,
          pimInvalidRegisterRp,
          pimInvalidJoinPruneNotificationPeriod,
          pimInvalidJoinPruneMsgsRcvd,
          pimInvalidJoinPruneAddressType,
          pimInvalidJoinPruneOrigin,
          pimInvalidJoinPruneGroup,
          pimInvalidJoinPruneRp,
          pimRPMMappingNotificationPeriod,
          pimRPMMappingChangeCount,
          pimInterfaceElectionNotificationPeriod,
          pimInterfaceElectionWinCount
        }
STATUS   current
DESCRIPTION
    "A collection of objects to support notification of PIM
    network management events."
::= { pimMIBGroups 11 }

pimNetMgmtNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS { pimInvalidRegister,
                    pimInvalidJoinPrune,
                    pimRPMMappingChange,
                    pimInterfaceElection
                  }
STATUS   current
DESCRIPTION
    "A collection of notifications for signaling PIM network
    management events."
::= { pimMIBGroups 12 }

pimDiagnosticsGroup OBJECT-GROUP
    OBJECTS { pimInAsserts,
              pimOutAsserts,
              pimLastAssertInterface,
              pimLastAssertGroupAddressType,
              pimLastAssertGroupAddress,
              pimLastAssertSourceAddressType,
              pimLastAssertSourceAddress,
              pimNeighborLossNotificationPeriod,
              pimNeighborLossCount
            }
STATUS   current
DESCRIPTION

```

Internet-Draft

PIM MIB

March 2007

```
        "Objects providing additional diagnostics related to a PIM
        router."
 ::= { pimMIBGroups 13 }

pimDmGroup OBJECT-GROUP
    OBJECTS {
        pimRefreshInterval,
        pimInterfacePruneLimitInterval,
        pimInterfaceGraftRetryInterval,
        pimInterfaceSRPriorityEnabled,
        pimNeighborSRCapable,
        pimSGUpstreamPruneState,
        pimSGUpstreamPruneLimitTimer,
        pimSGOriginatorState,
        pimSGSourceActiveTimer,
        pimSGStateRefreshTimer
    }
    STATUS current
    DESCRIPTION
        "A collection of objects required for management of PIM
        Dense Mode (PIM-DM) function.  The groups pimSsmGroup and
        pimSmGroup are also required."
    REFERENCE "RFC 3973"
    ::= { pimMIBGroups 14 }

pimDeviceStorageGroup OBJECT-GROUP
    OBJECTS { pimDeviceConfigStorageType
    }
    STATUS current
    DESCRIPTION
        "An object that specifies the volatility of global PIM
        configuration settings on this device."
    ::= { pimMIBGroups 15 }

END
```

[6.](#) 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, disrupts, or subverts services provided by the network, including (but not limited to) multicast data traffic delivery. 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
pimNeighborLossNotificationPeriod
pimInvalidRegisterNotificationPeriod
pimInvalidJoinPruneNotificationPeriod
pimRPMappingNotificationPeriod
pimInterfaceElectionNotificationPeriod
pimRefreshInterval
pimInterfaceTable
pimInterfaceEntry
pimInterfaceIfIndex
pimInterfaceIPVersion
pimInterfaceHelloInterval
pimInterfaceTrigHelloInterval
pimInterfaceJoinPruneInterval
pimInterfaceDFElectionRobustness
pimInterfaceHelloHoldtime
pimInterfaceJoinPruneHoldtime
pimInterfacePropagationDelay
pimInterfaceOverrideInterval
pimInterfaceDRPriority
pimInterfaceDomainBorder
pimInterfaceStatus
pimInterfaceStubInterface
pimInterfacePruneLimitInterval
pimStaticRPTable
pimStaticRPEntry
pimStaticRPAddressType

pimStaticRPGrpAddress
pimStaticRPGrpPrefixLength
pimStaticRPRPAddress
pimStaticRPPimMode
pimStaticRPOVERRIDEDynamic
pimStaticRPRowStatus
pimStaticRPPrecedence
pimAnycastRPSetTable
pimAnycastRPSetEntry
pimAnycastRPSetAddressType
pimAnycastRPSetAnycastAddress
pimAnycastRPSetRouterAddress

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
pimStarGIEntries
pimSGEntries
pimSGIEntries

pimSGRptEntries
pimSGRptIEntries
pimOutAsserts
pimInAsserts
pimLastAssertInterface
pimLastAssertGroupAddressType
pimLastAssertGroupAddress
pimLastAssertSourceAddressType
pimLastAssertSourceAddress
pimNeighborLossNotificationPeriod
pimNeighborLossCount
pimInvalidRegisterNotificationPeriod
pimInvalidRegisterMsgsRcvd
pimInvalidRegisterAddressType
pimInvalidRegisterOrigin
pimInvalidRegisterGroup
pimInvalidRegisterRp
pimInvalidJoinPruneNotificationPeriod
pimInvalidJoinPruneMsgsRcvd
pimInvalidJoinPruneAddressType

pimInvalidJoinPruneOrigin
pimInvalidJoinPruneGroup
pimInvalidJoinPruneRp
pimRPMMappingNotificationPeriod
pimRPMMappingChangeCount
pimInterfaceElectionNotificationPeriod
pimInterfaceElectionWinCount
pimRefreshInterval
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
pimInterfacePruneLimitInterval
pimInterfaceSRPriorityEnabled
pimNeighborTable
pimNeighborEntry
pimNeighborIfIndex
pimNeighborAddressType
pimNeighborAddress
pimNeighborUpTime
pimNeighborExpiryTime
pimNeighborLanPruneDelayPresent
pimNeighborPropagationDelay
pimNeighborOverrideInterval
pimNeighborTBit
pimNeighborGenerationIDPresent

pimNeighborGenerationIDValue
pimNeighborBidirCapable
pimNeighborDRPriorityPresent
pimNeighborDRPriority
pimNeighborSRCapable
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
pimStarGIIIfIndex
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
pimSGUpstreamPruneState
pimSGUpstreamPruneLimitTimer
pimSGOriginatorState
pimSGSourceActiveTimer
pimSGStateRefreshTimer
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

There is also a specific danger arising from the notification

Internet-Draft

PIM MIB

March 2007

pimInvalidRegister. This is originated by devices that receive an incorrect unicast-encapsulated multicast data packet, which poses a clear danger of propagating a DoS (Denial of Service) attack from the data or control plane to the network management plane. The following steps are taken to guard against this.

1. The notification is disabled by default. The writeable field `pimInvalidRegisterNotificationPeriod` must be set in order to enable it.
2. The syntax of `pimInvalidRegisterNotificationPeriod` prevents any given device from originating the notification more frequently than once every 10 seconds.
3. The counter `pimInvalidRegisterMsgsRcvd` provides equivalent function to the notification. Management applications are encouraged to monitor this counter in preference to enabling the notification.

The same measures are taken in respect of `pimInvalidJoinPrune`, though as this notification can only arise as a result of non-routable control packets, the risk is not so acute.

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.

[7.](#) IANA Considerations

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Sivaramu, et al.

Expires September 3, 2007

[Page 89]

Internet-Draft

PIM MIB

March 2007

Descriptor -----	OBJECT IDENTIFIER value -----
pimStdMIB	{ mib-2 XXX }

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

8. 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, and contributed the objects for management of PIM-DM.

Andrew Kessler should be credited with the good work done on revising notifications, and much reviewing besides.

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Expires September 3, 2007

[Page 90]

Internet-Draft

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March 2007

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[Page 91]

Internet-Draft

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March 2007

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Authors' Addresses

Raghava Sivaramu
Cisco Systems
425 E. Tasman Drive
San Jose CA 95134
USA

Email: raghava@cisco.com

James Lingard
Arastra, Inc
P.O. Box 10905
Palo Alto CA 94303
USA

Email: jchl@arastra.com

David McWalter
Data Connection Ltd
100 Church Street
Enfield EN2 6BQ
United Kingdom

Email: dmcw@dataconnection.com

Bharat Joshi
Infosys Technologies Ltd
Electronic City
Bangalore 560 100
India

Email: bharat_joshi@infosys.com

Sivaramu, et al.

Expires September 3, 2007

[Page 92]

Internet-Draft

PIM MIB

March 2007

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