

Network Working Group
Internet Draft
Obsoletes: [RFC 1850](#)

Editors
Dan Joyal
Nortel

Piotr Galecki
Airvana

Spencer Giacalone
CSFB

Original Authors
Rob Coltun
Touch Acoustra

Fred Baker
Cisco Systems

Document: [draft-ietf-ospf-mib-update-11.txt](#)
Expires: November 2006

May 2006

OSPF Version 2 Management Information Base

Status of this Memo

By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she becomes aware will be disclosed, in accordance with [Section 6 of BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at
<http://www.ietf.org/1id-abstracts.html>

The list of Internet-Draft Shadow Directories can be accessed at
<http://www.ietf.org/shadow.html>

Copyright Notice

Copyright (C) The Internet Society (2006). All rights reserved.

Abstract

This memo defines a portion of the Management Information Base (MIB)

Internet Draft

Expires November 2006

[Page 1]

OSPFv2 MIB

May 2006

for use with network management protocols in TCP/IP-based internets. In particular, it defines objects for managing version 2 of the Open Shortest Path First Routing Protocol. Version 2 of the OSPF protocol is specific to the IPv4 address family. Version 3 of the OSPF protocol is specific to the IPv6 address family.

This memo obsoletes [RFC 1850](#), however, it is designed to be backwards compatible. The functional differences between this memo and [RFC 1850](#) are explained in [section 12](#).

Table of Contents

1. Overview	3
1.1 The Internet-Standard Management Framework	3
1.2 Conceptual Row Creation	3
1.3 Default Configuration	4
1.4 OSPF Counters	5
1.5 Multiple OSPF Instances	5
1.6 Conventions	5
2. Structure of this MIB	6
2.1 The Purposes of the sections in this MIB	6
2.1.1 General Variables	6
2.1.2 Area Data Structure and Area Stub Metric Table	6
2.1.3 Link State Database and External Link State Database	6
2.1.4 Address Table and Host Tables	6
2.1.5 Interface and Interface Metric Tables	7
2.1.6 Virtual Interface Table	7
2.1.7 Neighbor and Virtual Neighbor Tables	7
2.1.8 Local Link State Database Table and Virtual Local Link State Database Table	7
2.1.9 AS-scope Link State Database Table	7
2.1.10 Area Lsa Count Table	7
3. OSPF MIB Module	7
4. OSPF Trap Overview	86
4.1 Introduction.....	86
4.2 Approach.....	86
4.3 Ignoring Initial Activity	87

4.4	Throttling Traps	87
4.5	One Trap Per OSPF Event	87
4.6	Polling Event Counters	88
4.7	Translating Notification Parameters	88
4.8	Historical Artifacts.....	89
5.	OSPF Trap Definitions	89
6.	Security Considerations	100
7.	IANA Considerations	101
8.	Acknowledgements	101
9.	References	101
9.1	Normative References	101
9.2	Informative References	102
10.	Intellectual Property	102
11.	TOS Support	103

Internet Draft

Expires November 2006

[Page 2]

OSPFv2 MIB

May 2006

12.	Changes from RFC 1850	103
12.1	General Group Changes	103
12.2	OSPF NSSA Enhancement Support	104
12.3	Opaque LSA Support	104
12.4	Graceful Restart Support	106
12.5	OSPF Compliances.....	106
12.6	OSPF Authentication and Security.....	107
12.7	OSPF Trap MIB	107
12.8	Miscellaneous	108
13.	Authors' Addresses	110
14.	Full Copyright Statement	110

[1.](#) Overview

[1.1](#) The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

[1.2](#) Conceptual Row Creation

For the benefit of row-creation in "conceptual" tables, DEFVAL (Default Value) clauses are included in the definitions in [section 3](#), suggesting values which an agent should use for instances of variables which need to be created due to a Set-Request, but which are not specified in the Set-Request. DEFVAL clauses have not been specified for some objects which are read-only, implying that they are zeroed upon row creation. These objects are of the SYNTAX Counter32 or Gauge32.

For those objects not having a DEFVAL clause, both management stations and agents should heed the Robustness Principle of the Internet (see [RFC-791](#)):

"be liberal in what you accept, conservative in what you send"

Therefore, management stations should include as many of these columnar objects as possible (e.g., all read-write objects) in a Set-Request when creating a conceptual row. Agents should accept a Set-Request with as few of these columnar objects as they need (e.g., the minimum contents of a "row-creating" SET consists of those objects for which, as they cannot be intuited, no default

is specified.).

[1.3](#) Default Configuration

OSPF is a powerful routing protocol, equipped with features to handle virtually any configuration requirement that might reasonably be found within an Autonomous System. With this power comes a fair degree of complexity, which the sheer number of objects in the MIB will attest to. Care has therefore been taken, in constructing this MIB, to define default values for virtually every object, to minimize the amount of parameterization required in the typical case. That default configuration is as follows:

Given the following assumptions:

- IP has already been configured
- The ifTable has already been configured

- ifSpeed is estimated by the interface drivers
- The OSPF Process automatically discovers all IP Interfaces and creates corresponding OSPF Interfaces
- The OSPF Process automatically creates the Areas required for the Interfaces

The simplest configuration of an OSPF process requires that:

- The OSPF Process be Enabled.

This can be accomplished with a single SET:

```
ospfAdminStat := enabled.
```

The configured system will have the following attributes:

- The RouterID will be one of the IP addresses of the device
- The device will be neither an Area Border Router nor an Autonomous System Border Router.
- Every IP Interface, with or without an address, will be an OSPF Interface.
- The AreaID of each interface will be 0.0.0.0, the Backbone.
- Authentication will be disabled
- All Broadcast and Point to Point interfaces will be operational. NBMA Interfaces require the configuration

of at least one neighbor.

- Timers on all direct interfaces will be:

Hello Interval:	10 seconds
Dead Timeout:	40 Seconds
Retransmission:	5 Seconds
Transit Delay:	1 Second
Poll Interval:	120 Seconds

- No direct links to hosts will be configured.
- No addresses will be summarized
- Metrics, being a measure of bit duration, are unambiguous and intelligent.
- No Virtual Links will be configured.

[1.4](#) OSPF Counters

This MIB defines several counters, namely:

- ospfOriginateNewLsas, ospfRxNewLsas in the ospfGeneralGroup
- ospfSpfRuns, ospfAreaNssaTranslatorEvents in the ospfAreaTable
- ospfIfEvents in the ospfIfTable
- ospfVirtIfEvents in the ospfVirtIfTable
- ospfNbrEvents in the ospfNbrTable
- ospfVirtNbrEvents in the ospfVirtNbrEvents.

As a best practice, a management entity, when reading these counters, should use the discontinuity object, ospfDiscontinuityTime, to determine if an event which would invalidate the management entity understanding of the counters has occurred. A restart of the OSPF routing process is a possible example of a discontinuity event.

[1.5](#) Multiple OSPF Instances

SNMPv3 supports "Contexts" which can be used to implement MIB views on multiple OSPF instances on the same system. See [RFC 3411](#) or its successors for details.

[1.6](#) Conventions

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

[2.](#) Structure of this MIB

This MIB is composed of the following sections:

General Variables
Area Data Structure
Area Stub Metric Table
Link State Database
Address Range Table
Host Table
Interface Table
Interface Metric Table
Virtual Interface Table
Neighbor Table
Virtual Neighbor Table
External Link State Database
Aggregate Range Table
Local Link State Database
AS-scope Link State Database

It supports the base OSPFv2 specification [[RFC2328](#)] and extensions to OSPFv2 such as [[RFC1765](#)], [[RFC1793](#)], [[RFC2370](#)], [[RFC3101](#)] and [[RFC3623](#)].

There exists a separate MIB for notifications ("traps"), which is entirely optional.

[2.1](#) The Purposes of the sections in this MIB

[2.1.1](#) General Variables

The General Variables describe (as it may seem from the name) variables which are global to the OSPF Process.

[2.1.2](#) Area Data Structure and Area Stub Metric Table

The Area Data Structure describes all of the OSPF Areas that the router participates in. The Area Table includes data for NSSA translation.

The Area Stub Metric Table describes the metrics advertised into a stub area by the default router(s).

[2.1.3](#) Link State Database and External Link State Database

The Link State Database is provided primarily to provide detailed information for network debugging.

[2.1.4](#) Address Table and Host Tables

The Address Range Table and Host Table are provided to view configured Network Summary and Host Route information.

[2.1.5](#) Interface and Interface Metric Tables

The Table and the Interface Metric Table together describe

Internet Draft

Expires November 2006

[Page 6]

OSPFv2 MIB

May 2006

the various IP interfaces to OSPF. The metrics are placed in separate tables in order to simplify dealing with multiple types of service. The Interface table includes Link-Local (Opaque Type-9) LSA statistics.

[2.1.6](#) Virtual Interface Table

The Virtual Interface Table describes virtual links to the OSPF Process, similarly to the (non-Virtual)Interface Tables. This table includes Link-Local (Opaque Type-9) LSA statistics.

[2.1.7](#) Neighbor and Virtual Neighbor Tables

The Neighbor Table and the Virtual Neighbor Table describe the neighbors to the OSPF Process.

[2.1.8](#) Local Link State Database Table and Virtual Local Link State Database Table

The Local Link State Database Table and Virtual Local Link State Database Table are identical to the OSPF LSDB Table in format, but contain only Link-Local (Opaque Type-9) Link State Advertisements for non-virtual and virtual links.

[2.1.9](#) AS-scope Link State Database Table

The AS-scope Link State Database Table is identical to the OSPF LSDB Table in format, but contains only AS-scoped Link State Advertisements.

[2.1.10](#) Area Lsa Count Table

The table, which maintains number of link state advertisements on the per area per LSA type basis.

[3.](#) OSPF MIB Module

OSPF-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, Counter32, Gauge32,
Integer32, Unsigned32, IpAddress, mib-2
FROM SNMPv2-SMI
TEXTUAL-CONVENTION, TruthValue, RowStatus, TimeStamp
FROM SNMPv2-TC
MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF
InterfaceIndexOrZero
FROM IF-MIB;

ospf MODULE-IDENTITY

LAST-UPDATED "200605240900Z" -- May 24, 2006 09:00:00 EST

Internet Draft

Expires November 2006

[Page 7]

OSPFv2 MIB

May 2006

ORGANIZATION "IETF OSPF Working Group"

CONTACT-INFO

"WG E-Mail: ospf@ietf.org

WG Chairs: acee@cisco.com
rohit@gmail.com

Editors: Dan Joyal
Nortel
600 Technology Park Drive
Billerica, MA 01821
djoyal@nortel.com

Piotr Galecki
Airvana
19 Alpha Road
Chelmsford, MA 01824
pgalecki@airvana.com

Spencer Giacalone
Credit Suisse First Boston
Eleven Madison Ave
New York, NY 10010-3629
spencer.giacalone@csfb.com

DESCRIPTION

"The MIB module to describe the OSPF Version 2 Protocol. Note that some objects in this MIB module may pose a significant security risk. Refer to the Security Considerations section

in RFC XXXX for more information.

Copyright (C) The Internet Society (2006).
This version of this MIB module is part of
RFC XXXX; see the RFC itself for full legal
notices."

-- RFC Editor: please fill in XXXX and remove this note

REVISION "200605240900Z" -- May 24, 2006 09:00:00 EST
DESCRIPTION

"Updated for latest changes to OSPF Version 2:
- updated the General Group with the new
ospfRFC1583Compatibility, ospfReferenceBandwidth
and ospfDiscontinuityTime objects
- added graceful restart related objects
- added stub router related objects
- updated the Area Table with NSSA related objects
- added ospfAreaAggregateExtRouteTag object
- added opaque LSA related objects
- updates to the Compliances and Security sections
- added area LSA counter table
- added section describing translation of notification

Internet Draft

Expires November 2006

[Page 8]

OSPFv2 MIB

May 2006

parameters between SNMP versions
- added ospfComplianceObsolete to contain obsolete
object groups
- deprecated ospfExtLsdbTable
See [section 12](#) of RFC XXXX for more details.

This version published as part of RFC XXXX"

-- RFC Editor: please fill in XXXX and remove this note

REVISION "199501201225Z" -- Fri Jan 20 12:25:50 PST 1995
DESCRIPTION

"The initial SMIV2 revision of this MIB module, published
in [RFC1850](#)."
::= { mib-2 14 }

AreaID ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An OSPF Area Identifier.

Note that the Area ID, in OSPF, has the same format as an IP Address, but has the function of defining a summarization point for Link State Advertisements."

SYNTAX IpAddress

RouterID ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
 "A OSPF Router Identifier.
 Note that the Router ID, in OSPF, has the same format as an IP Address, but identifies the router independent of its IP Address."
SYNTAX IpAddress

Metric ::= TEXTUAL-CONVENTION
DISPLAY-HINT "d-0"
STATUS current
DESCRIPTION
 "The OSPF Internal Metric.
 Note the OSPF Metric is defined as an unsigned value in the range."
SYNTAX Integer32 (0..'FFFF'h)

BigMetric ::= TEXTUAL-CONVENTION
DISPLAY-HINT "d-0"
STATUS current
DESCRIPTION
 "The OSPF External Metric."
SYNTAX Integer32 (0..'FFFFFF'h)

Status ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION

"An indication of the operability of an OSPF function or feature. For example, The status of an interface: 'enabled' indicates that it is willing to communicate with other OSPF Routers, while 'disabled' indicates that it is not."

SYNTAX INTEGER { enabled (1), disabled (2) }

PositiveInteger ::= TEXTUAL-CONVENTION
DISPLAY-HINT "d-0"
STATUS current

DESCRIPTION

"A positive integer. Values in excess are precluded as unnecessary and prone to interoperability issues."

SYNTAX Integer32 (0..'7FFFFFFF'h)

HelloRange ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-0"

STATUS current

DESCRIPTION

"The range of intervals in seconds on which hello messages are exchanged."

SYNTAX Integer32 (1..'FFFF'h)

UpToMaxAge ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-0"

STATUS current

DESCRIPTION

"The values in seconds that one might find or configure for variables bounded by the maximum age of an LSA."

SYNTAX Integer32 (0..3600)

DesignatedRouterPriority ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-0"

STATUS current

DESCRIPTION

"The range of values defined for the priority of a system for becoming the designated router."

SYNTAX Integer32 (0..'FF'h)

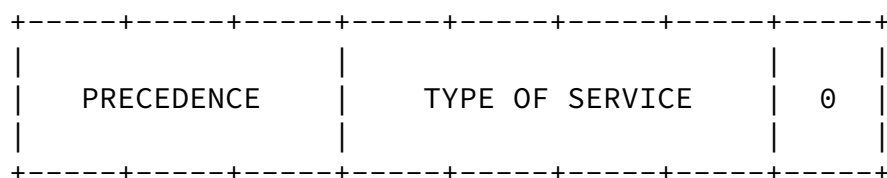
TOSType ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-0"

STATUS current

DESCRIPTION

"Type of Service is defined as a mapping to the IP Type of Service Flags as defined in the IP Forwarding Table MIB



IP TOS

IP TOS

Field	Policy	Field	Policy
Contents	Code	Contents	Code
0 0 0 0	==> 0	0 0 0 1	==> 2
0 0 1 0	==> 4	0 0 1 1	==> 6
0 1 0 0	==> 8	0 1 0 1	==> 10
0 1 1 0	==> 12	0 1 1 1	==> 14
1 0 0 0	==> 16	1 0 0 1	==> 18
1 0 1 0	==> 20	1 0 1 1	==> 22
1 1 0 0	==> 24	1 1 0 1	==> 26
1 1 1 0	==> 28	1 1 1 1	==> 30

The remaining values are left for future definition."

SYNTAX Integer32 (0..30)

OspfAuthenticationType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The authentication type."

SYNTAX INTEGER {
none (0),
simplePassword (1),
md5 (2)
-- reserved for specification by IANA (> 2)
}

-- OSPF General Variables

-- Note: These parameters apply globally to the Router's
-- OSPF Process.

ospfGeneralGroup OBJECT IDENTIFIER ::= { ospf 1 }

ospfRouterId OBJECT-TYPE

SYNTAX RouterID

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"A 32-bit integer uniquely identifying the router in the Autonomous System.

By convention, to ensure uniqueness, this should default to the value of one of the router's IP interface addresses.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, C.1 Global parameters"

::= { ospfGeneralGroup 1 }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The administrative status of OSPF in the router. The value 'enabled' denotes that the OSPF Process is active on at least one interface; 'disabled' disables it on all interfaces.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

::= { ospfGeneralGroup 2 }

ospfVersionNumber OBJECT-TYPE

SYNTAX INTEGER { version2 (2) }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current version number of the OSPF protocol is 2."

REFERENCE

"OSPF Version 2, Title"

::= { ospfGeneralGroup 3 }

ospfAreaBdrRtrStatus OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A flag to note whether this router is an area border router."

REFERENCE

"OSPF Version 2, [Section 3](#) Splitting the AS into Areas"

::= { ospfGeneralGroup 4 }

ospfASBdrRtrStatus OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"A flag to note whether this router is configured as

an Autonomous System border router.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, [Section 3.3](#) Classification of routers"

::= { ospfGeneralGroup 5 }

ospfExternLsaCount OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

Internet Draft

Expires November 2006

[Page 12]

OSPFv2 MIB

May 2006

STATUS current

DESCRIPTION

"The number of external (LS type 5) link-state advertisements in the link-state database."

REFERENCE

"OSPF Version 2, [Appendix A.4.5](#) AS external link advertisements"

::= { ospfGeneralGroup 6 }

ospfExternLsaCksumSum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 32-bit sum of the LS checksums of the external link-state advertisements contained in the link-state database. This sum can be used to determine if there has been a change in a router's link state database, and to compare the link-state database of two routers. The value should be treated as unsigned when comparing two sums of checksums."

::= { ospfGeneralGroup 7 }

ospfTOSSupport OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The router's support for type-of-service routing."

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, [Appendix F.1.2](#) Optional TOS support"

::= { ospfGeneralGroup 8 }

ospfOriginateNewLsas OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of new link-state advertisements that have been originated. This number is incremented each time the router originates a new LSA.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ospfDiscontinuityTime."

::= { ospfGeneralGroup 9 }

ospfRxNewLsas OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of link-state advertisements received determined to be new instantiations. This number does not include newer instantiations of self-originated link-state advertisements.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ospfDiscontinuityTime."

::= { ospfGeneralGroup 10 }

ospfExtLsdbLimit OBJECT-TYPE

SYNTAX Integer32 (-1..'7FFFFFFF'h)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The maximum number of non-default AS-external-LSAs entries that can be stored in the link-state database. If the value is -1, then there is no limit.

When the number of non-default AS-external-LSAs in a router's link-state database reaches ospfExtLsdbLimit, the router enters Overflow-State. The router never holds more than ospfExtLsdbLimit non-default AS-external-LSAs in its database. OspfExtLsdbLimit MUST be set identically in all routers attached to the OSPF backbone and/or any regular OSPF area. (i.e., OSPF stub areas and NSSAs are excluded).

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

DEFVAL { -1 }

::= { ospfGeneralGroup 11 }

ospfMulticastExtensions OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"A Bit Mask indicating whether the router is forwarding IP multicast (Class D) datagrams based on the algorithms defined in the Multicast Extensions to OSPF.

Bit 0, if set, indicates that the router can forward IP multicast datagrams in the router's directly attached areas (called intra-area multicast routing).

Bit 1, if set, indicates that the router can forward IP multicast datagrams between OSPF areas (called inter-area multicast routing).

Bit 2, if set, indicates that the router can

forward IP multicast datagrams between Autonomous Systems (called inter-AS multicast routing).

Only certain combinations of bit settings are allowed, namely: 0 (no multicast forwarding is enabled), 1 (intra-area multicasting only), 3 (intra-area and inter-area multicasting), 5 (intra-area and inter-AS multicasting) and 7 (multicasting everywhere). By default, no multicast forwarding is enabled.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

DEFVAL { 0 }

::= { ospfGeneralGroup 12 }

ospfExitOverflowInterval OBJECT-TYPE

SYNTAX PositiveInteger

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The number of seconds that, after entering OverflowState, a router will attempt to leave OverflowState. This allows the router to again originate non-default AS-external-LSAs. When set to 0, the router will not leave Overflow-State until restarted.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

DEFVAL { 0 }

::= { ospfGeneralGroup 13 }

ospfDemandExtensions OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The router's support for demand routing.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"Extending OSPF to Support Demand Circuits"

::= { ospfGeneralGroup 14 }

ospfRFC1583Compatibility OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates metrics used to choose among multiple AS-external-LSAs. When RFC1583Compatibility is set to enabled, only cost will be used when choosing among multiple AS-external-LSAs advertising the same destination. When RFC1583Compatibility is set to disabled, preference will be driven first by type of path using cost only to break ties.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, [Section 16.4.1](#) External path preferences"

::= { ospfGeneralGroup 15 }

ospfOpaqueLsaSupport OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The router's support for Opaque LSA types.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"The OSPF Opaque LSA Option"

::= { ospfGeneralGroup 16 }

ospfReferenceBandwidth OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kilobits per second"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Reference bandwidth in kilobits/second for calculating default interface metrics. The default value is 100,000 Kbps (100 Mbps)

OSPFv2 MIB

May 2006

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

::= { ospfGeneralGroup 17 }

ospfRestartSupport OBJECT-TYPE

SYNTAX INTEGER { none (1),
 plannedOnly (2),
 plannedAndUnplanned (3)
 }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The router's support for OSPF graceful restart. Options include: no restart support, only planned restarts or both planned and unplanned restarts.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

::= { ospfGeneralGroup 18 }

ospfRestartInterval OBJECT-TYPE

SYNTAX Integer32 (1..1800)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Configured OSPF graceful restart timeout interval.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

::= { ospfGeneralGroup 19 }

ospfRestartStrictLsaChecking OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates if strict LSA checking is enabled for graceful restart.

This object is persistent and when written
the entity SHOULD save the change to non-volatile
storage."

::= { ospfGeneralGroup 20 }

ospfRestartStatus OBJECT-TYPE

SYNTAX INTEGER { notRestarting (1),
plannedRestart (2),
unplannedRestart (3)

Internet Draft

Expires November 2006

[Page 17]

OSPFv2 MIB

May 2006

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Current status of OSPF graceful restart."
::= { ospfGeneralGroup 21 }

ospfRestartAge OBJECT-TYPE

SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Remaining time in current OSPF graceful restart
interval."
::= { ospfGeneralGroup 22 }

ospfRestartExitReason OBJECT-TYPE

SYNTAX INTEGER { none (1), -- none attempted
inProgress (2), -- restart in
progress
completed (3), -- successfully
completed
timedOut (4), -- timed out
topologyChanged (5) -- aborted due to
topology change.
}

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Describes the outcome of the last attempt at a
graceful restart. If the value is 'none', no restart

has yet been attempted. If the value is 'InProgress',
a restart attempt is currently underway."
 ::= { ospfGeneralGroup 23 }

ospfAsLsaCount OBJECT-TYPE

SYNTAX Gauge32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The number of AS-scope link-state
advertisements in the AS-scope link-state database."

::= { ospfGeneralGroup 24 }

ospfAsLsaCksumSum OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The 32-bit unsigned sum of the LS checksums of
the AS link-state advertisements contained in the AS-scope
link-state database. This sum can be used to determine

if there has been a change in a router's AS-scope link
state database, and to compare the AS-scope link-state
database of two routers."
 ::= { ospfGeneralGroup 25 }

ospfStubRouterSupport OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The router's support for stub router functionality.

This object is persistent and when written
the entity SHOULD save the change to non-volatile
storage."

REFERENCE

"OSPF Stub Router Advertisement"

::= { ospfGeneralGroup 26 }

ospfStubRouterAdvertisement OBJECT-TYPE

SYNTAX INTEGER {
doNotAdvertise (1),

```

                                advertise(2)
                                }
MAX-ACCESS      read-write
STATUS          current
DESCRIPTION
    "This object controls the advertisement of
    stub router LSA's by the router. The value
    doNotAdvertise will result in the advertisement
    of a standard router LSA and is the default value.

    This object is persistent and when written
    the entity SHOULD save the change to non-volatile
    storage."
 ::= { ospfGeneralGroup 27 }

ospfDiscontinuityTime OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of sysUpTime on the most recent occasion
        at which any one of this MIB's counters suffered
        a discontinuity.

        If no such discontinuities have occurred since the last
        reinitialization of the local management subsystem,
        then this object contains a zero value."
 ::= { ospfGeneralGroup 28 }

```

-- OSPF Area Table

Internet Draft

Expires November 2006

[Page 19]

OSPFv2 MIB

May 2006

```

--      The OSPF Area Table contains information
--      regarding the various areas.

```

```

ospfAreaTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF OspfAreaEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Information describing the configured parameters and
        cumulative statistics of the router's attached areas.
        The interfaces and virtual links are configured

```

as part of these areas. Area 0.0.0.0, by definition,
is the Backbone Area."

REFERENCE

"OSPF Version 2, [Section 6](#) The Area Data Structure"

::= { ospf 2 }

ospfAreaEntry OBJECT-TYPE

SYNTAX OspfAreaEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information describing the configured parameters and
cumulative statistics of one of the router's attached areas.
The interfaces and virtual links are configured as part of
these areas. Area 0.0.0.0, by definition, is the Backbone
Area.

Information in this table is persistent and when this object
is written the entity SHOULD save the change to non-volatile
storage."

INDEX { ospfAreaId }

::= { ospfAreaTable 1 }

OspfAreaEntry ::=

SEQUENCE {

ospfAreaId

AreaID,

ospfAuthType

OspfAuthenticationType,

ospfImportAsExtern

INTEGER,

ospfSpfRuns

Counter32,

ospfAreaBdrRtrCount

Gauge32,

ospfAsBdrRtrCount

Gauge32,

ospfAreaLsaCount

Gauge32,

ospfAreaLsaCksumSum

Integer32,

ospfAreaSummary

INTEGER,


```

ospfAreaStatus
    RowStatus,
ospfAreaNssaTranslatorRole
    INTEGER,
ospfAreaNssaTranslatorState
    INTEGER,
ospfAreaNssaTranslatorStabilityInterval
    PositiveInteger,
ospfAreaNssaTranslatorEvents
    Counter32
}

```

ospfAreaId OBJECT-TYPE

```

SYNTAX          AreaID
MAX-ACCESS      read-only -- read-only since originally
                        -- an SMIV1 index

STATUS          current
DESCRIPTION
    "A 32-bit integer uniquely identifying an area.
    Area ID 0.0.0.0 is used for the OSPF backbone."
REFERENCE
    "OSPF Version 2, Appendix C.2 Area parameters"
::= { ospfAreaEntry 1 }

```

ospfAuthType OBJECT-TYPE

```

SYNTAX          OspfAuthenticationType
MAX-ACCESS      read-create
STATUS          obsolete
DESCRIPTION
    "The authentication type specified for an area."
REFERENCE
    "OSPF Version 2, Appendix D Authentication"
DEFVAL { none } -- no authentication, by default
::= { ospfAreaEntry 2 }

```

ospfImportAsExtern OBJECT-TYPE

```

SYNTAX          INTEGER {
                    importExternal (1),
                    importNoExternal (2),
                    importNssa (3)
                  }
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Indicates whether an area is a Stub area, NSSA, or standard
    area. Type-5 AS-External LSAs and Type-11 Opaque LSAs are
    not imported into Stub Areas or NSSAs. NSSAs import
    AS-External data as Type-7 LSAs"
REFERENCE
    "OSPF Version 2, Appendix C.2 Area parameters"
DEFVAL { importExternal }

```

OSPFv2 MIB

May 2006

```
::= { ospfAreaEntry 3 }
```

```
ospfSpfRuns OBJECT-TYPE
```

```
SYNTAX Counter32
```

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

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of times that the intra-area route
table has been calculated using this area's
link-state database. This is typically done
using Dijkstra's algorithm."
```

```
Discontinuities in the value of this counter can occur
at re-initialization of the management system, and at other
times as indicated by the value of ospfDiscontinuityTime."
```

```
::= { ospfAreaEntry 4 }
```

```
ospfAreaBdrRtrCount OBJECT-TYPE
```

```
SYNTAX Gauge32
```

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

```
STATUS current
```

```
DESCRIPTION
```

```
"The total number of area border routers reachable
within this area. This is initially zero, and is
calculated in each SPF Pass."
```

```
::= { ospfAreaEntry 5 }
```

```
ospfAsBdrRtrCount OBJECT-TYPE
```

```
SYNTAX Gauge32
```

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

```
STATUS current
```

```
DESCRIPTION
```

```
"The total number of Autonomous System border
routers reachable within this area. This is
initially zero, and is calculated in each SPF
Pass."
```

```
::= { ospfAreaEntry 6 }
```

```
ospfAreaLsaCount OBJECT-TYPE
```

```
SYNTAX Gauge32
```

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

```
STATUS current
```

```
DESCRIPTION
```

"The total number of link-state advertisements in this area's link-state database, excluding AS External LSA's."
 ::= { ospfAreaEntry 7 }

ospfAreaLsaChecksumSum OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

Internet Draft

Expires November 2006

[Page 22]

OSPFv2 MIB

May 2006

"The 32-bit sum of the link-state advertisements' LS checksums contained in this area's link-state database. This sum excludes external (LS type 5) link-state advertisements. The sum can be used to determine if there has been a change in a router's link-state database, and to compare the link-state database of two routers. The value should be treated as unsigned when comparing two sums of checksums."
DEFVAL { 0 }
 ::= { ospfAreaEntry 8 }

ospfAreaSummary OBJECT-TYPE

SYNTAX INTEGER {
noAreaSummary (1),
sendAreaSummary (2)
}
MAX-ACCESS read-create
STATUS current
DESCRIPTION

"The variable ospfAreaSummary controls the import of summary LSAs into stub and NSSA areas. It has no effect on other areas.

If it is noAreaSummary, the router will not originate summary LSAs into the stub or NSSA area. It will rely entirely on its default route.

If it is sendAreaSummary, the router will both summarize and propagate summary LSAs."

DEFVAL { noAreaSummary }
 ::= { ospfAreaEntry 9 }

ospfAreaStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This object permits management of the table by facilitating actions such as row creation, construction and destruction.

The value of this object has no effect on whether other objects in this conceptual row can be modified."

::= { ospfAreaEntry 10 }

ospfAreaNssaTranslatorRole OBJECT-TYPE

SYNTAX INTEGER { always (1), candidate (2) }
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"Indicates an NSSA Border router's ability to

perform NSSA translation of type-7 LSAs into type-5 LSAs."

DEFVAL { candidate }

::= { ospfAreaEntry 11 }

ospfAreaNssaTranslatorState OBJECT-TYPE

SYNTAX INTEGER { enabled (1),
elected (2),
disabled (3)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates if and how an NSSA Border router is performing NSSA translation of type-7 LSAs into type-5 LSAs. When this object set to enabled, the NSSA Border router's OspfAreaNssaExtTranslatorRole has been set to always. When this object is set to elected, a candidate NSSA Border router is Translating type-7 LSAs into type-5. When this object is set to disabled, a candidate NSSA Border router is NOT translating type-7 LSAs into type-5."

::= { ospfAreaEntry 12 }

ospfAreaNssaTranslatorStabilityInterval OBJECT-TYPE

SYNTAX PositiveInteger

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The number of seconds after an elected translator determines its services are no longer required, that it should continue to perform its translation duties."

DEFVAL { 40 }

::= { ospfAreaEntry 13 }

ospfAreaNssaTranslatorEvents OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the number of Translator State changes that have occurred since the last boot-up."

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ospfDiscontinuityTime."

::= { ospfAreaEntry 14 }

-- OSPF Area Default Metric Table

ospfStubAreaTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfStubAreaEntry

Internet Draft

Expires November 2006

[Page 24]

OSPFv2 MIB

May 2006

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The set of metrics that will be advertised by a default Area Border Router into a stub area."

REFERENCE

"OSPF Version 2, [Appendix C.2](#), Area Parameters"

::= { ospf 3 }

ospfStubAreaEntry OBJECT-TYPE

SYNTAX OspfStubAreaEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The metric for a given Type of Service that will be advertised by a default Area Border Router into a stub area.

Information in this table is persistent and when this object is written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, [Appendix C.2](#), Area Parameters"

INDEX { ospfStubAreaId, ospfStubTOS }

::= { ospfStubAreaTable 1 }

OspfStubAreaEntry ::=

```
SEQUENCE {
    ospfStubAreaId
        AreaID,
    ospfStubTOS
        TOSType,
    ospfStubMetric
        BigMetric,
    ospfStubStatus
        RowStatus,
    ospfStubMetricType
        INTEGER
}
```

ospfStubAreaId OBJECT-TYPE

SYNTAX AreaID

MAX-ACCESS read-only -- read-only since originally an
-- SMiv1 index

STATUS current

DESCRIPTION

"The 32 bit identifier for the Stub Area. On creation, this can be derived from the instance."

::= { ospfStubAreaEntry 1 }

ospfStubTOS OBJECT-TYPE

SYNTAX TOSType

MAX-ACCESS read-only -- read-only since originally an
-- SMiv1 index

STATUS current

DESCRIPTION

"The Type of Service associated with the metric. On creation, this can be derived from the instance."

::= { ospfStubAreaEntry 2 }

ospfStubMetric OBJECT-TYPE

SYNTAX BigMetric

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The metric value applied at the indicated type of service. By default, this equals the least metric at the type of service among the interfaces to other areas."

::= { ospfStubAreaEntry 3 }

ospfStubStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object permits management of the table by facilitating actions such as row creation, construction and destruction."

The value of this object has no effect on whether other objects in this conceptual row can be modified."

::= { ospfStubAreaEntry 4 }

ospfStubMetricType OBJECT-TYPE

SYNTAX INTEGER {
ospfMetric (1), -- OSPF Metric
comparableCost (2), -- external type 1
nonComparable (3) -- external type 2
}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This variable displays the type of metric advertised as a default route."

DEFVAL { ospfMetric }

::= { ospfStubAreaEntry 5 }

-- OSPF Link State Database

ospfLsdbTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfLsdbEntry

OSPFv2 MIB

May 2006

MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "The OSPF Process's Link State Database (LSDB).
 The LSDB contains the Link State Advertisements
 from throughout the areas that the device is attached to."
REFERENCE
 "OSPF Version 2, [Section 12](#) Link State Advertisements"
::= { ospf 4 }

ospfLsdbEntry OBJECT-TYPE
SYNTAX OspfLsdbEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "A single Link State Advertisement."
INDEX { ospfLsdbAreaId, ospfLsdbType,
 ospfLsdbLsid, ospfLsdbRouterId }
::= { ospfLsdbTable 1 }

OspfLsdbEntry ::=

SEQUENCE {
 ospfLsdbAreaId
 AreaID,
 ospfLsdbType
 INTEGER,
 ospfLsdbLsid
 IpAddress,
 ospfLsdbRouterId
 RouterID,
 ospfLsdbSequence
 Integer32,
 ospfLsdbAge
 Integer32,
 ospfLsdbChecksum
 Integer32,
 ospfLsdbAdvertisement
 OCTET STRING
}

ospfLsdbAreaId OBJECT-TYPE
SYNTAX AreaID
MAX-ACCESS read-only -- read-only since originally an


```

-- SMiv1 index
STATUS          current
DESCRIPTION
    "The 32 bit identifier of the Area from which
    the LSA was received."
REFERENCE
    "OSPF Version 2, Appendix C.2 Area parameters"
 ::= { ospfLsdbEntry 1 }

```

ospfLsdbType OBJECT-TYPE

Internet Draft

Expires November 2006

[Page 27]

OSPFv2 MIB

May 2006

```

SYNTAX          INTEGER {
                    routerLink (1),
                    networkLink (2),
                    summaryLink (3),
                    asSummaryLink (4),
                    asExternalLink (5), -- but see ospfAsLsdbTable
                    multicastLink (6),
                    nssaExternalLink (7),
                    areaOpaqueLink (10)
                  }
MAX-ACCESS      read-only -- read-only since originally an
                        -- SMiv1 index
STATUS          current
DESCRIPTION
    "The type of the link state advertisement.
    Each link state type has a separate advertisement
    format.

    Note: ExternalLink State Advertisements are permitted
    for backward compatibility, but should be displayed
    in the ospfAsLsdbTable rather than here."
REFERENCE
    "OSPF Version 2, Appendix A.4.1 The Link State
    Advertisement header"
 ::= { ospfLsdbEntry 2 }

```

ospfLsdbLsid OBJECT-TYPE

```

SYNTAX          IpAddress
MAX-ACCESS      read-only -- read-only since originally an
                        -- SMiv1 index
STATUS          current
DESCRIPTION
    "The Link State ID is an LS Type Specific field

```

containing either a Router ID or an IP Address;
it identifies the piece of the routing domain
that is being described by the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.4](#) Link State ID"
::= { ospfLsdbEntry 3 }

ospfLsdbRouterId OBJECT-TYPE

SYNTAX RouterID

MAX-ACCESS read-only -- read-only since originally an
-- SMIV1 index

STATUS current

DESCRIPTION

"The 32 bit number that uniquely identifies the
originating router in the Autonomous System."

REFERENCE

"OSPF Version 2, [Appendix C.1](#) Global parameters"
::= { ospfLsdbEntry 4 }

ospfLsdbSequence OBJECT-TYPE

Internet Draft

Expires November 2006

[Page 28]

OSPFv2 MIB

May 2006

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The sequence number field is a signed 32-bit
integer. It starts with the value '80000001'h,
or -'7FFFFFFF'h, and increments until '7FFFFFFF'h.
Thus, a typical sequence number will be very negative.
It is used to detect old and duplicate link state
advertisements. The space of sequence numbers is linearly
ordered. The larger the sequence number the more recent
the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.6](#) LS sequence
number"
::= { ospfLsdbEntry 5 }

ospfLsdbAge OBJECT-TYPE

SYNTAX Integer32 -- Should be 0..MaxAge, except when
-- doNotAge bit is set

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the age of the link state advertisement in seconds."

REFERENCE

"OSPF Version 2, [Section 12.1.1](#) LS age"

::= { ospfLsdbEntry 6 }

ospfLsdbChecksum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum."

REFERENCE

"OSPF Version 2, [Section 12.1.7](#) LS checksum"

::= { ospfLsdbEntry 7 }

ospfLsdbAdvertisement OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (1..65535))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The entire Link State Advertisement, including its header."

Note that for variable length LSAs, SNMP agents may not be able to return the largest string size"

REFERENCE

"OSPF Version 2, [Section 12](#) Link State Advertisements"

::= { ospfLsdbEntry 8 }

-- Address Range Table

ospfAreaRangeTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfAreaRangeEntry

MAX-ACCESS not-accessible

STATUS obsolete

DESCRIPTION

"The Address Range Table acts as an adjunct to the Area Table. It describes those Address Range Summaries that are configured to be propagated from an Area to reduce the amount of information about it which is known beyond its borders. It contains a set of IP address ranges specified by an IP address/IP network mask pair. For example, class B address range of X.X.X.X with a network mask of 255.255.0.0 includes all IP addresses from X.X.0.0 to X.X.255.255.

Note that this table is obsoleted and is replaced by the Area Aggregate Table."

REFERENCE

"OSPF Version 2, [Appendix C.2](#) Area parameters"
::= { ospf 5 }

ospfAreaRangeEntry OBJECT-TYPE

SYNTAX OspfAreaRangeEntry
MAX-ACCESS not-accessible
STATUS obsolete

DESCRIPTION

"A single area address range.

Information in this table is persistent and when this object is written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, [Appendix C.2](#) Area parameters"
INDEX { ospfAreaRangeAreaId, ospfAreaRangeNet }
::= { ospfAreaRangeTable 1 }

OspfAreaRangeEntry ::=

SEQUENCE {
 ospfAreaRangeAreaId
 AreaID,
 ospfAreaRangeNet
 IpAddress,
 ospfAreaRangeMask
 IpAddress,

ospfAreaRangeStatus
 RowStatus,
ospfAreaRangeEffect

```
        INTEGER
    }
}
```

ospfAreaRangeAreaId OBJECT-TYPE

```
SYNTAX      AreaID
MAX-ACCESS  read-only -- read-only since originally an
                                -- SMIV1 index

STATUS      obsolete
DESCRIPTION
    "The Area the Address Range is to be found
    within."
REFERENCE
    "OSPF Version 2, Appendix C.2 Area parameters"
 ::= { ospfAreaRangeEntry 1 }
```

ospfAreaRangeNet OBJECT-TYPE

```
SYNTAX      IpAddress
MAX-ACCESS  read-only -- read-only since originally an
                                -- SMIV1 index

STATUS      obsolete
DESCRIPTION
    "The IP Address of the Net or Subnet indicated
    by the range."
REFERENCE
    "OSPF Version 2, Appendix C.2 Area parameters"
 ::= { ospfAreaRangeEntry 2 }
```

ospfAreaRangeMask OBJECT-TYPE

```
SYNTAX      IpAddress
MAX-ACCESS  read-create
STATUS      obsolete
DESCRIPTION
    "The Subnet Mask that pertains to the Net or
    Subnet."
REFERENCE
    "OSPF Version 2, Appendix C.2 Area parameters"
 ::= { ospfAreaRangeEntry 3 }
```

ospfAreaRangeStatus OBJECT-TYPE

```
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      obsolete
DESCRIPTION
    "This object permits management of the table by
    facilitating actions such as row creation,
    construction and destruction.

    The value of this object has no effect on
    whether other objects in this conceptual row can be
    modified."
```

OSPFv2 MIB

May 2006

```
::= { ospfAreaRangeEntry 4 }
```

```
ospfAreaRangeEffect OBJECT-TYPE
```

```
SYNTAX          INTEGER {  
                    advertiseMatching (1),  
                    doNotAdvertiseMatching (2)  
                    }
```

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

```
STATUS          obsolete
```

```
DESCRIPTION
```

```
    "Subnets subsumed by ranges either trigger the  
    advertisement of the indicated summary  
    (advertiseMatching), or result in the subnet's not  
    being advertised at all outside the area."
```

```
DEFVAL { advertiseMatching }
```

```
::= { ospfAreaRangeEntry 5 }
```

```
-- OSPF Host Table
```

```
ospfHostTable OBJECT-TYPE
```

```
SYNTAX          SEQUENCE OF OspfHostEntry
```

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

```
STATUS          current
```

```
DESCRIPTION
```

```
    "The Host/Metric Table indicates what hosts are directly  
    attached to the Router, what metrics and types  
    of service should be advertised for them  
    and what Areas they are found within."
```

```
REFERENCE
```

```
    "OSPF Version 2, Appendix C.7 Host route  
    parameters"
```

```
::= { ospf 6 }
```

```
ospfHostEntry OBJECT-TYPE
```

```
SYNTAX          OspfHostEntry
```

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

```
STATUS          current
```

```
DESCRIPTION
```

```
    "A metric to be advertised, for a given type of  
    service, when a given host is reachable."
```

```
    Information in this table is persistent and when this object
```

```
        is written the entity SHOULD save the change to non-volatile
        storage."
INDEX { ospfHostIpAddress, ospfHostTOS }
 ::= { ospfHostTable 1 }
```

```
OspfHostEntry ::=
    SEQUENCE {
        ospfHostIpAddress
            IPAddress,
        ospfHostTOS
```

Internet Draft

Expires November 2006

[Page 32]

OSPFv2 MIB

May 2006

```
        TOSType,
        ospfHostMetric
            Metric,
        ospfHostStatus
            RowStatus,
        ospfHostAreaID
            AreaID,
        ospfHostCfgAreaID
            AreaID
    }
```

```
ospfHostIpAddress OBJECT-TYPE
    SYNTAX      IPAddress
    MAX-ACCESS   read-only -- read-only since originally an
                           -- SMIV1 index
    STATUS       current
    DESCRIPTION
        "The IP Address of the Host."
    REFERENCE
        "OSPF Version 2, Appendix C.7 Host route parameters"
    ::= { ospfHostEntry 1 }
```

```
ospfHostTOS OBJECT-TYPE
    SYNTAX      TOSType
    MAX-ACCESS   read-only -- read-only since originally an
                           -- SMIV1 index
    STATUS       current
    DESCRIPTION
        "The Type of Service of the route being configured."
    REFERENCE
        "OSPF Version 2, Appendix C.7 Host route parameters"
    ::= { ospfHostEntry 2 }
```

ospfHostMetric OBJECT-TYPE

SYNTAX Metric

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Metric to be advertised."

REFERENCE

"OSPF Version 2, [Appendix C.7](#) Host route parameters"

::= { ospfHostEntry 3 }

ospfHostStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object permits management of the table by facilitating actions such as row creation, construction and destruction.

The value of this object has no effect on

whether other objects in this conceptual row can be modified."

::= { ospfHostEntry 4 }

ospfHostAreaID OBJECT-TYPE

SYNTAX AreaID

MAX-ACCESS read-only

STATUS deprecated

DESCRIPTION

"The OSPF Area to which the Host belongs.
Deprecated by ospfHostCfgAreaID."

REFERENCE

"OSPF Version 2, [Appendix C.7](#) Host parameters"

::= { ospfHostEntry 5 }

ospfHostCfgAreaID OBJECT-TYPE

SYNTAX AreaID

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"To configure the OSPF Area to which the Host belongs."

REFERENCE

"OSPF Version 2, [Appendix C.7](#) Host parameters"


```
::= { ospfHostEntry 6 }
```

-- OSPF Interface Table

ospfIfTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfIfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The OSPF Interface Table describes the interfaces
from the viewpoint of OSPF.

It augments the ipAddrTable with OSPF specific information."

REFERENCE

"OSPF Version 2, [Appendix C.3](#) Router interface
parameters"

```
::= { ospf 7 }
```

ospfIfEntry OBJECT-TYPE

SYNTAX OspfIfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The OSPF Interface Entry describes one interface
from the viewpoint of OSPF.

Information in this table is persistent and when this object
is written the entity SHOULD save the change to non-volatile
storage."

INDEX { ospfIfIpAddress, ospfAddressLessIf }

```
::= { ospfIfTable 1 }
```

OspfIfEntry ::=

SEQUENCE {

ospfIfIpAddress

IpAddress,

ospfAddressLessIf

InterfaceIndexOrZero,

ospfIfAreaId

AreaID,

ospfIfType

INTEGER,

ospfIfAdminStat

```

        Status,
ospfIfRtrPriority
        DesignatedRouterPriority,
ospfIfTransitDelay
        UpToMaxAge,
ospfIfRetransInterval
        UpToMaxAge,
ospfIfHelloInterval
        HelloRange,
ospfIfRtrDeadInterval
        PositiveInteger,
ospfIfPollInterval
        PositiveInteger,
ospfIfState
        INTEGER,
ospfIfDesignatedRouter
        IpAddress,
ospfIfBackupDesignatedRouter
        IpAddress,
ospfIfEvents
        Counter32,
ospfIfAuthKey
        OCTET STRING,
ospfIfStatus
        RowStatus,
ospfIfMulticastForwarding
        INTEGER,
ospfIfDemand
        TruthValue,
ospfIfAuthType
        OspfAuthenticationType,
ospfIfLsaCount
        Gauge32,
ospfIfLsaCksumSum
        Unsigned32,
ospfIfDesignatedRouterId
        RouterID,
ospfIfBackupDesignatedRouterId
        RouterID
}

```

```

ospfIfIpAddress OBJECT-TYPE
    SYNTAX      IpAddress

```

```

MAX-ACCESS    read-only -- read-only since originally an
                                -- SMiv1 index
STATUS        current
DESCRIPTION
    "The IP address of this OSPF interface."
::= { ospfIfEntry 1 }

ospfAddressLessIf OBJECT-TYPE
SYNTAX        InterfaceIndexOrZero
MAX-ACCESS    read-only -- read-only since originally an
                                -- SMiv1 index
STATUS        current
DESCRIPTION
    "For the purpose of easing the instancing of
    addressed and address less interfaces; This
    variable takes the value 0 on interfaces with
    IP Addresses, and the corresponding value of
    ifIndex for interfaces having no IP Address."
::= { ospfIfEntry 2 }

ospfIfAreaId OBJECT-TYPE
SYNTAX        AreaID
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "A 32-bit integer uniquely identifying the area
    to which the interface connects. Area ID
    0.0.0.0 is used for the OSPF backbone."
DEFVAL { '00000000'H } -- 0.0.0.0
::= { ospfIfEntry 3 }

ospfIfType OBJECT-TYPE
SYNTAX        INTEGER {
                    broadcast (1),
                    nbma (2),
                    pointToPoint (3),
                    pointToMultipoint (5)
                }
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "The OSPF interface type.
    By way of a default, this field may be intuited
    from the corresponding value of ifType.
    Broadcast LANs, such as Ethernet and IEEE 802.5,
    take the value 'broadcast', X.25 and similar
    technologies take the value 'nbma', and links
    that are definitively point to point take the
    value 'pointToPoint'."
::= { ospfIfEntry 4 }

```

OSPFv2 MIB

May 2006

ospfIfAdminStat OBJECT-TYPE

SYNTAX Status

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The OSPF interface's administrative status.

The value formed on the interface, and the interface will be advertised as an internal route to some area.

The value 'disabled' denotes that the interface is external to OSPF."

DEFVAL { enabled }

::= { ospfIfEntry 5 }

ospfIfRtrPriority OBJECT-TYPE

SYNTAX DesignatedRouterPriority

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers will use their Router ID as a tie breaker."

DEFVAL { 1 }

::= { ospfIfEntry 6 }

ospfIfTransitDelay OBJECT-TYPE

SYNTAX UpToMaxAge

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The estimated number of seconds it takes to transmit a link state update packet over this interface. Note that minimal value SHOULD be 1 second."

DEFVAL { 1 }

::= { ospfIfEntry 7 }

ospfIfRetransInterval OBJECT-TYPE

SYNTAX UpToMaxAge
UNITS "seconds"
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"The number of seconds between link-state advertisement retransmissions, for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets. Note that minimal value SHOULD be 1 second."

Internet Draft

Expires November 2006

[Page 37]

OSPFv2 MIB

May 2006

DEFVAL { 5 }
::= { ospfIfEntry 8 }

ospfIfHelloInterval OBJECT-TYPE

SYNTAX HelloRange
UNITS "seconds"
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"The length of time, in seconds, between the Hello packets that the router sends on the interface. This value must be the same for all routers attached to a common network."

DEFVAL { 10 }
::= { ospfIfEntry 9 }

ospfIfRtrDeadInterval OBJECT-TYPE

SYNTAX PositiveInteger
UNITS "seconds"
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"The number of seconds that a router's Hello packets have not been seen before it's neighbors declare the router down. This should be some multiple of the Hello interval. This value must be the same for all routers attached to a common network."

DEFVAL { 40 }
::= { ospfIfEntry 10 }

ospfIfPollInterval OBJECT-TYPE

SYNTAX PositiveInteger
UNITS "seconds"
MAX-ACCESS read-create

STATUS current
 DESCRIPTION
 "The larger time interval, in seconds, between the Hello packets sent to an inactive non-broadcast multi-access neighbor."
 DEFVAL { 120 }
 ::= { ospfIfEntry 11 }

ospfIfState OBJECT-TYPE

SYNTAX INTEGER {
 down (1),
 loopback (2),
 waiting (3),
 pointToPoint (4),
 designatedRouter (5),
 backupDesignatedRouter (6),
 otherDesignatedRouter (7)
 }
 MAX-ACCESS read-only
 STATUS current

Internet Draft

Expires November 2006

[Page 38]

OSPFv2 MIB

May 2006

DESCRIPTION
 "The OSPF Interface State."
 DEFVAL { down }
 ::= { ospfIfEntry 12 }

ospfIfDesignatedRouter OBJECT-TYPE

SYNTAX IPAddress
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The IP Address of the Designated Router."
 DEFVAL { '00000000'H } -- 0.0.0.0
 ::= { ospfIfEntry 13 }

ospfIfBackupDesignatedRouter OBJECT-TYPE

SYNTAX IPAddress
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The IP Address of the Backup Designated Router."
 DEFVAL { '00000000'H } -- 0.0.0.0
 ::= { ospfIfEntry 14 }

ospfIfEvents OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times this OSPF interface has changed its state, or an error has occurred.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ospfDiscontinuityTime."

::= { ospfIfEntry 15 }

ospfIfAuthKey OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..256))

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The cleartext password used as an OSPF Authentication key when simplePassword security is enabled. This object does not access any OSPF Cryptographic (e.g. MD5) Authentication Key under any circumstance.

If the key length is shorter than 8 octets, the agent will left adjust and zero fill to 8 octets.

Unauthenticated interfaces need no authentication key, and simple password authentication cannot use

a key of more than 8 octets.

Note that the use of simplePassword authentication is NOT recommended when there is concern regarding attack upon the OSPF system. SimplePassword authentication is only sufficient to protect against accidental misconfigurations because it re-uses cleartext passwords. [[RFC1704](#)]

When read, ospfIfAuthKey always returns an Octet String of length zero."

REFERENCE

"OSPF Version 2, [Section 9](#) The Interface Data

```

        Structure"
        DEFVAL { '0000000000000000'H } -- 0.0.0.0.0.0.0
        ::= { ospfIfEntry 16 }

```

ospfIfStatus OBJECT-TYPE

```

        SYNTAX      RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION

```

"This object permits management of the table by facilitating actions such as row creation, construction and destruction.

The value of this object has no effect on whether other objects in this conceptual row can be modified."

```

        ::= { ospfIfEntry 17 }

```

ospfIfMulticastForwarding OBJECT-TYPE

```

        SYNTAX      INTEGER {
                        blocked (1), -- no multicast forwarding
                        multicast (2), -- using multicast address
                        unicast (3) -- to each OSPF neighbor
                        }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION

```

"The way multicasts should forwarded on this interface; not forwarded, forwarded as data link multicasts, or forwarded as data link unicasts. Data link multicasting is not meaningful on point to point and NBMA interfaces, and setting ospfMulticastForwarding to 0 effectively disables all multicast forwarding."

```

        DEFVAL { blocked }
        ::= { ospfIfEntry 18 }

```

ospfIfDemand OBJECT-TYPE

```

        SYNTAX      TruthValue
        MAX-ACCESS   read-create

```

```

        STATUS       current

```

```

        DESCRIPTION

```

"Indicates whether Demand OSPF procedures (hello

suppression to FULL neighbors and setting the DoNotAge flag on propagated LSAs) should be performed on this interface."

DEFVAL { false }
::= { ospfIfEntry 19 }

ospfIfAuthType OBJECT-TYPE

SYNTAX OspfAuthenticationType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The authentication type specified for an interface.

Note that this object can be used to engage in significant attacks against an OSPF router."

REFERENCE

"OSPF Version 2, [Appendix D](#) Authentication"

DEFVAL { none } -- no authentication, by default

::= { ospfIfEntry 20 }

ospfIfLsaCount OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of link-local link state advertisements in this interface's link-local link state database."

::= { ospfIfEntry 21 }

ospfIfLsaCksumSum OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 32-bit unsigned sum of the link-state advertisements' LS checksums contained in this interface's link-local link state database. The sum can be used to determine if there has been a change in the interface's link state database, and to compare the interface link-state database of routers attached to the same subnet."

::= { ospfIfEntry 22 }

ospfIfDesignatedRouterId OBJECT-TYPE

SYNTAX RouterID

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Router ID of the Designated Router."

::= { ospfIfEntry 23 }

OSPFv2 MIB

May 2006

ospfIfBackupDesignatedRouterId OBJECT-TYPE

SYNTAX RouterID

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Router ID of the Backup Designated Router."

::= { ospfIfEntry 24 }

-- OSPF Interface Metric Table

ospfIfMetricTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfIfMetricEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Metric Table describes the metrics to be advertised for a specified interface at the various types of service. As such, this table is an adjunct of the OSPF Interface Table.

Types of service, as defined by [RFC 791](#), have the ability to request low delay, high bandwidth, or reliable linkage.

For the purposes of this specification, the measure of bandwidth:

$$\text{Metric} = \text{referenceBandwidth} / \text{ifSpeed}$$

is the default value.

The default reference bandwidth is 10^8 .

For multiple link interfaces, note that ifSpeed is the sum of the individual link speeds. This yields a number having the following typical values:

Network Type/bit rate	Metric
-----------------------	--------

>= 100 MBPS	1
Ethernet/802.3	10
E1	48
T1 (ESF)	65
64 Kbps	1562
56 Kbps	1785

19.2 KBPS	5208
9.6 KBPS	10416

Routes that are not specified use the default (TOS 0) metric

Note that the default reference bandwidth can be configured using the general group object ospfReferenceBandwidth."

REFERENCE

"OSPF Version 2, [Appendix C.3](#) Router interface parameters"

Internet Draft

Expires November 2006

[Page 42]

OSPFv2 MIB

May 2006

::= { ospf 8 }

ospfIfMetricEntry OBJECT-TYPE

SYNTAX OspfIfMetricEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A particular TOS metric for a non-virtual interface identified by the interface index.

Information in this table is persistent and when this object is written the entity SHOULD save the change to non-volatile storage."

REFERENCE

"OSPF Version 2, [Appendix C.3](#) Router interface parameters"

INDEX { ospfIfMetricIpAddress,
ospfIfMetricAddressLessIf,
ospfIfMetricTOS }

::= { ospfIfMetricTable 1 }

OspfIfMetricEntry ::=

SEQUENCE {

ospfIfMetricIpAddress

IpAddress,

ospfIfMetricAddressLessIf

InterfaceIndexOrZero,

ospfIfMetricTOS

TOSType,

ospfIfMetricValue

Metric,

ospfIfMetricStatus

RowStatus

```
ospfIfMetricIpAddress OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS   read-only -- read-only since originally an
                           -- SMiv1 index
    STATUS       current
    DESCRIPTION
        "The IP address of this OSPF interface. On row
        creation, this can be derived from the instance."
    ::= { ospfIfMetricEntry 1 }
```

Internet Draft Expires November 2006 [Page 43]

May 2006

```
variable takes the value 0 on interfaces with
IP Addresses, and the value of ifIndex for
interfaces having no IP Address. On row
creation, this can be derived from the instance."
::= { ospfIfMetricEntry 2 }
```

```
ospfIfMetricTOS OBJECT-TYPE
    SYNTAX      TOSType
    MAX-ACCESS   read-only -- read-only since originally an
                           -- SMIPv1 index
    STATUS       current
    DESCRIPTION
        "The type of service metric being referenced.
        On row creation, this can be derived from the
        instance."
    ::= { ospfIfMetricEntry 3 }
```

```
ospfIfMetricValue OBJECT-TYPE
    SYNTAX      Metric
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The metric of using this type of service on
```

this interface. The default value of the TOS 0
 Metric is $10^8 / \text{ifSpeed}$."
::= { ospfIfMetricEntry 4 }

ospfIfMetricStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This object permits management of the table by
facilitating actions such as row creation,
construction and destruction.

The value of this object has no effect on
whether other objects in this conceptual row can be
modified."

::= { ospfIfMetricEntry 5 }

-- OSPF Virtual Interface Table

ospfVirtIfTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfVirtIfEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"Information about this router's virtual interfaces
that the OSPF Process is configured to carry on."

REFERENCE

"OSPF Version 2, [Appendix C.4](#) Virtual link

 parameters"
::= { ospf 9 }

ospfVirtIfEntry OBJECT-TYPE

SYNTAX OspfVirtIfEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"Information about a single Virtual Interface.

Information in this table is persistent and when this object
is written the entity SHOULD save the change to non-volatile
storage."

```
INDEX { ospfVirtIfAreaId, ospfVirtIfNeighbor }
 ::= { ospfVirtIfTable 1 }
```

```
OspfVirtIfEntry ::=
  SEQUENCE {
    ospfVirtIfAreaId
      AreaID,
    ospfVirtIfNeighbor
      RouterID,
    ospfVirtIfTransitDelay
      UpToMaxAge,
    ospfVirtIfRetransInterval
      UpToMaxAge,
    ospfVirtIfHelloInterval
      HelloRange,
    ospfVirtIfRtrDeadInterval
      PositiveInteger,
    ospfVirtIfState
      INTEGER,
    ospfVirtIfEvents
      Counter32,
    ospfVirtIfAuthKey
      OCTET STRING,
    ospfVirtIfStatus
      RowStatus,
    ospfVirtIfAuthType
      OspfAuthenticationType,
    ospfVirtIfLsaCount
      Gauge32,
    ospfVirtIfLsaCksumSum
      Unsigned32
  }
```

```
ospfVirtIfAreaId OBJECT-TYPE
  SYNTAX      AreaID
  MAX-ACCESS  read-only -- read-only since originally an
                        -- SMIV1 index
  STATUS      current
  DESCRIPTION
    "The Transit Area that the Virtual Link
```

```
traverses. By definition, this is not 0.0.0.0"
 ::= { ospfVirtIfEntry 1 }
```

```
ospfVirtIfNeighbor OBJECT-TYPE
    SYNTAX          RouterID
    MAX-ACCESS      read-only -- read-only since originally an
                                -- SMiv1 index
    STATUS          current
    DESCRIPTION
        "The Router ID of the Virtual Neighbor."
    ::= { ospfVirtIfEntry 2 }
```

```
ospfVirtIfTransitDelay OBJECT-TYPE
    SYNTAX          UpToMaxAge
    UNITS           "seconds"
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The estimated number of seconds it takes to
        transmit a link-state update packet over this
        interface. Note that minimal value SHOULD be
        one second."
    DEFVAL { 1 }
    ::= { ospfVirtIfEntry 3 }
```

```
ospfVirtIfRetransInterval OBJECT-TYPE
    SYNTAX          UpToMaxAge
    UNITS           "seconds"
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The number of seconds between link-state
        advertisement retransmissions, for adjacencies
        belonging to this interface. This value is
        also used when retransmitting database
        description and link-state request packets. This
        value should be well over the expected
        round-trip time. Note that minimal value SHOULD be
        one second."
    DEFVAL { 5 }
    ::= { ospfVirtIfEntry 4 }
```

```
ospfVirtIfHelloInterval OBJECT-TYPE
    SYNTAX          HelloRange
    UNITS           "seconds"
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The length of time, in seconds, between the
        Hello packets that the router sends on the
        interface. This value must be the same for the
        virtual neighbor."
    DEFVAL { 10 }
```

OSPFv2 MIB

May 2006

```
::= { ospfVirtIfEntry 5 }
```

```
ospfVirtIfRtrDeadInterval OBJECT-TYPE
```

```
SYNTAX      PositiveInteger
```

```
UNITS       "seconds"
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The number of seconds that a router's Hello
    packets have not been seen before it's
    neighbors declare the router down. This should be
    some multiple of the Hello interval. This
    value must be the same for the virtual neighbor."
```

```
DEFVAL { 60 }
```

```
::= { ospfVirtIfEntry 6 }
```

```
ospfVirtIfState OBJECT-TYPE
```

```
SYNTAX      INTEGER {
                    down (1), -- these use the same encoding
                    pointToPoint (4) -- as the ospfIfTable
                }
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "OSPF virtual interface states."
```

```
DEFVAL { down }
```

```
::= { ospfVirtIfEntry 7 }
```

```
ospfVirtIfEvents OBJECT-TYPE
```

```
SYNTAX      Counter32
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The number of state changes or error events on
    this Virtual Link.
```

```
    Discontinuities in the value of this counter can occur
    at re-initialization of the management system, and at other
    times as indicated by the value of ospfDiscontinuityTime."
```

```
::= { ospfVirtIfEntry 8 }
```

```
ospfVirtIfAuthKey OBJECT-TYPE
```

```
SYNTAX      OCTET STRING (SIZE(0..256))
```


MAX-ACCESS read-create
STATUS current
DESCRIPTION

"The cleartext password used as an OSPF Authentication key when simplePassword security is enabled. This object does not access any OSPF Cryptographic (e.g. MD5) Authentication Key under any circumstance.

If the key length is shorter than 8 octets, the

agent will left adjust and zero fill to 8 octets.

Unauthenticated interfaces need no authentication key, and simple password authentication cannot use a key of more than 8 octets.

Note that the use of simplePassword authentication is NOT recommended when there is concern regarding attack upon the OSPF system. SimplePassword authentication is only sufficient to protect against accidental misconfigurations because it re-uses cleartext passwords. [[RFC1704](#)]

When read, ospfIfAuthKey always returns an Octet String of length zero."

REFERENCE

"OSPF Version 2, [Section 9](#) The Interface Data Structure"

DEFVAL { '0000000000000000'H } -- 0.0.0.0.0.0.0
::= { ospfVirtIfEntry 9 }

ospfVirtIfStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This object permits management of the table by facilitating actions such as row creation, construction and destruction.

The value of this object has no effect on whether other objects in this conceptual row can be modified."

```
::= { ospfVirtIfEntry 10 }
```

ospfVirtIfAuthType OBJECT-TYPE

SYNTAX OspfAuthenticationType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The authentication type specified for a virtual interface.

Note that this object can be used to engage
in significant attacks against an OSPF router."

REFERENCE

"OSPF Version 2, [Appendix E](#) Authentication"

DEFVAL { none } -- no authentication, by default

```
::= { ospfVirtIfEntry 11 }
```

ospfVirtIfLsaCount OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

Internet Draft

Expires November 2006

[Page 48]

OSPFv2 MIB

May 2006

DESCRIPTION

"The total number of link-local link state advertisements
in this virtual interface's link-local link state database."

```
::= { ospfVirtIfEntry 12 }
```

ospfVirtIfLsaCksumSum OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 32-bit unsigned sum of the link-state
advertisements' LS checksums contained in this
virtual interface's link-local link state database.
The sum can be used to determine if there has
been a change in the virtual interface's link state
database, and to compare the virtual interface
link-state database of the virtual neighbors."

```
::= { ospfVirtIfEntry 13 }
```

-- OSPF Neighbor Table

ospfNbrTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfNbrEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "A table describing all non-virtual neighbors
 in the locality of the OSPF router."
 REFERENCE
 "OSPF Version 2, [Section 10](#) The Neighbor Data
 Structure"
 ::= { ospf 10 }

ospfNbrEntry OBJECT-TYPE

SYNTAX OspfNbrEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "The information regarding a single neighbor.

 Information in this table is persistent and when this object
 is written the entity SHOULD save the change to non-volatile
 storage."
 REFERENCE
 "OSPF Version 2, [Section 10](#) The Neighbor Data
 Structure"
 INDEX { ospfNbrIpAddress, ospfNbrAddressLessIndex }
 ::= { ospfNbrTable 1 }

OspfNbrEntry ::=
 SEQUENCE {
 ospfNbrIpAddress

 IpAddress,
 ospfNbrAddressLessIndex
 InterfaceIndexOrZero,
 ospfNbrRtrId
 RouterID,
 ospfNbrOptions
 Integer32,
 ospfNbrPriority
 DesignatedRouterPriority,
 ospfNbrState
 INTEGER,
 ospfNbrEvents
 Counter32,

```

ospfNbrLsRetransQLen
    Gauge32,
ospfNbmaNbrStatus
    RowStatus,
ospfNbmaNbrPermanence
    INTEGER,
ospfNbrHelloSuppressed
    TruthValue,
ospfNbrRestartHelperStatus
    INTEGER,
ospfNbrRestartHelperAge
    Unsigned32,
ospfNbrRestartHelperExitReason
    INTEGER
}

```

ospfNbrIpAddress OBJECT-TYPE

```

SYNTAX      IpAddress
MAX-ACCESS  read-only -- read-only since originally an
                        -- SMiv1 index
STATUS      current
DESCRIPTION
    "The IP address this neighbor is using in its
    IP Source Address. Note that, on addressless
    links, this will not be 0.0.0.0, but the
    address of another of the neighbor's interfaces."
 ::= { ospfNbrEntry 1 }

```

ospfNbrAddressLessIndex OBJECT-TYPE

```

SYNTAX      InterfaceIndexOrZero
MAX-ACCESS  read-only -- read-only since originally an
                        -- SMiv1 index
STATUS      current
DESCRIPTION
    "On an interface having an IP Address, zero.
    On addressless interfaces, the corresponding
    value of ifIndex in the Internet Standard MIB.
    On row creation, this can be derived from the
    instance."
 ::= { ospfNbrEntry 2 }

```

ospfNbrRtrId OBJECT-TYPE

```

SYNTAX      RouterID

```

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A 32-bit integer (represented as a type
IpAddress) uniquely identifying the neighboring
router in the Autonomous System."
DEFVAL { '00000000'H } -- 0.0.0.0
::= { ospfNbrEntry 3 }

ospfNbrOptions OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"A Bit Mask corresponding to the neighbor's
options field.

Bit 0, if set, indicates that the system will
operate on Type of Service metrics other than
TOS 0. If zero, the neighbor will ignore all
metrics except the TOS 0 metric.

Bit 1, if set, indicates that the associated
area accepts and operates on external
information; if zero, it is a stub area.

Bit 2, if set, indicates that the system is
capable of routing IP Multicast datagrams; i.e.,
that it implements the Multicast Extensions to
OSPF.

Bit 3, if set, indicates that the associated
area is an NSSA. These areas are capable of
carrying type 7 external advertisements, which
are translated into type 5 external advertisements
at NSSA borders."

REFERENCE

"OSPF Version 2, [Section 12.1.2](#) Options"

DEFVAL { 0 }
::= { ospfNbrEntry 4 }

ospfNbrPriority OBJECT-TYPE

SYNTAX DesignatedRouterPriority
MAX-ACCESS read-create
STATUS current
DESCRIPTION

"The priority of this neighbor in the designated
router election algorithm. The value 0 signifies
that the neighbor is not eligible to become
the designated router on this particular network."

OSPFv2 MIB

May 2006

```
DEFVAL { 1 }
 ::= { ospfNbrEntry 5 }
```

ospfNbrState OBJECT-TYPE

```
SYNTAX          INTEGER {
                    down (1),
                    attempt (2),
                    init (3),
                    twoWay (4),
                    exchangeStart (5),
                    exchange (6),
                    loading (7),
                    full (8)
                  }
```

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

```
STATUS          current
```

DESCRIPTION

"The State of the relationship with this Neighbor."

REFERENCE

"OSPF Version 2, [Section 10.1](#) Neighbor States"

```
DEFVAL { down }
```

```
 ::= { ospfNbrEntry 6 }
```

ospfNbrEvents OBJECT-TYPE

```
SYNTAX          Counter32
```

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

```
STATUS          current
```

DESCRIPTION

"The number of times this neighbor relationship has changed state, or an error has occurred."

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ospfDiscontinuityTime."

```
 ::= { ospfNbrEntry 7 }
```

ospfNbrLsRetransQLen OBJECT-TYPE

```
SYNTAX          Gauge32
```

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

```
STATUS          current
```

DESCRIPTION

"The current length of the retransmission queue."

::= { ospfNbrEntry 8 }

ospfNbmaNbrStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object permits management of the table by facilitating actions such as row creation, construction and destruction."

Internet Draft

Expires November 2006

[Page 52]

OSPFv2 MIB

May 2006

The value of this object has no effect on whether other objects in this conceptual row can be modified."

::= { ospfNbrEntry 9 }

ospfNbmaNbrPermanence OBJECT-TYPE

SYNTAX INTEGER {

dynamic (1), -- learned through protocol

permanent (2) -- configured address

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This variable displays the status of the entry. 'dynamic' and 'permanent' refer to how the neighbor became known."

DEFVAL { permanent }

::= { ospfNbrEntry 10 }

ospfNbrHelloSuppressed OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether Hellos are being suppressed to the neighbor."

::= { ospfNbrEntry 11 }

ospfNbrRestartHelperStatus OBJECT-TYPE

SYNTAX INTEGER { notHelping (1),

helping (2)

}

```

MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "Indicates whether the router is acting
    as a graceful restart helper for the neighbor."
 ::= { ospfNbrEntry 12 }

```

ospfNbrRestartHelperAge OBJECT-TYPE

```

SYNTAX        Unsigned32
UNITS         "seconds"
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "Remaining time in current OSPF graceful restart
    interval, if the router is acting as a restart
    helper for the neighbor."
 ::= { ospfNbrEntry 13 }

```

ospfNbrRestartHelperExitReason OBJECT-TYPE

```

SYNTAX        INTEGER { none (1),          -- not attempted

```

Internet Draft

Expires November 2006

[Page 53]

OSPFv2 MIB

May 2006

```

    inProgress (2),      -- restart in
                          -- progress
    completed (3),       -- successfully
                          -- completed
    timedOut (4),        -- timed out
    topologyChanged (5) -- aborted due to
                          -- topology
                          -- change.
}

```

```

MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "Describes the outcome of the last attempt at acting
    as a graceful restart helper for the neighbor."
 ::= { ospfNbrEntry 14 }

```

-- OSPF Virtual Neighbor Table

ospfVirtNbrTable OBJECT-TYPE

```

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

```


"This table describes all virtual neighbors.
Since Virtual Links are configured
in the virtual interface table, this table is read-only."
REFERENCE
"OSPF Version 2, [Section 15](#) Virtual Links"
::= { ospf 11 }

ospfVirtNbrEntry OBJECT-TYPE
SYNTAX OspfVirtNbrEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Virtual neighbor information.

Information in this table is persistent and when this object
is written the entity SHOULD save the change to non-volatile
storage."

INDEX { ospfVirtNbrArea, ospfVirtNbrRtrId }
::= { ospfVirtNbrTable 1 }

OspfVirtNbrEntry ::=

SEQUENCE {
ospfVirtNbrArea
AreaID,
ospfVirtNbrRtrId
RouterID,
ospfVirtNbrIpAddr
IpAddress,
ospfVirtNbrOptions
Integer32,

ospfVirtNbrState
INTEGER,
ospfVirtNbrEvents
Counter32,
ospfVirtNbrLsRetransQLen
Gauge32,
ospfVirtNbrHelloSuppressed
TruthValue,
ospfVirtNbrRestartHelperStatus
INTEGER,
ospfVirtNbrRestartHelperAge
Unsigned32,
ospfVirtNbrRestartHelperExitReason

INTEGER
}

ospfVirtNbrArea OBJECT-TYPE

SYNTAX AreaID

MAX-ACCESS read-only -- read-only since originally an
-- SMiv1 index

STATUS current

DESCRIPTION

"The Transit Area Identifier."

::= { ospfVirtNbrEntry 1 }

ospfVirtNbrRtrId OBJECT-TYPE

SYNTAX RouterID

MAX-ACCESS read-only -- read-only since originally an
-- SMiv1 index

STATUS current

DESCRIPTION

"A 32-bit integer uniquely identifying the
neighboring router in the Autonomous System."

::= { ospfVirtNbrEntry 2 }

ospfVirtNbrIpAddr OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address this Virtual Neighbor is using."

::= { ospfVirtNbrEntry 3 }

ospfVirtNbrOptions OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A Bit Mask corresponding to the neighbor's
options field.

Bit 1, if set, indicates that the system will
operate on Type of Service metrics other than

TOS 0. If zero, the neighbor will ignore all
metrics except the TOS 0 metric.

Bit 2, if set, indicates that the system is Network Multicast capable; ie, that it implements OSPF Multicast Routing."
 ::= { ospfVirtNbrEntry 4 }

ospfVirtNbrState OBJECT-TYPE

SYNTAX INTEGER {
down (1),
attempt (2),
init (3),
twoWay (4),
exchangeStart (5),
exchange (6),
loading (7),
full (8)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The state of the Virtual Neighbor Relationship."

::= { ospfVirtNbrEntry 5 }

ospfVirtNbrEvents OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times this virtual link has changed its state, or an error has occurred."

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ospfDiscontinuityTime."

::= { ospfVirtNbrEntry 6 }

ospfVirtNbrLsRetransQLen OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current length of the retransmission queue."

::= { ospfVirtNbrEntry 7 }

ospfVirtNbrHelloSuppressed OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether Hellos are being suppressed"

OSPFv2 MIB

May 2006

```
        to the neighbor"
 ::= { ospfVirtNbrEntry 8 }

ospfVirtNbrRestartHelperStatus OBJECT-TYPE
    SYNTAX      INTEGER { notHelping (1),
                          helping (2)
    }
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates whether the router is acting
         as a graceful restart helper for the neighbor."
 ::= { ospfVirtNbrEntry 9 }

ospfVirtNbrRestartHelperAge OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Remaining time in current OSPF graceful restart
         interval, if the router is acting as a restart
         helper for the neighbor."
 ::= { ospfVirtNbrEntry 10 }

ospfVirtNbrRestartHelperExitReason OBJECT-TYPE
    SYNTAX      INTEGER { none (1),          -- not attempted
                          inProgress (2),     -- restart in
                                              -- progress
                          completed (3),     -- successfully
                                              -- completed
                          timedOut (4),       -- timed out
                          topologyChanged (5) -- aborted due to
                                              -- topology
                                              -- change.
    }
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Describes the outcome of the last attempt at acting
         as a graceful restart helper for the neighbor."
 ::= { ospfVirtNbrEntry 11 }
```

-- OSPF Link State Database, External

```
ospfExtLsdbTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF OspfExtLsdbEntry
    MAX-ACCESS      not-accessible
    STATUS           deprecated
    DESCRIPTION
        "The OSPF Process's External LSA Link State Database."
```

Internet Draft

Expires November 2006

[Page 57]

OSPFv2 MIB

May 2006

This table is identical to the OSPF LSDB Table in format, but contains only External Link State Advertisements. The purpose is to allow external LSAs to be displayed once for the router rather than once in each non-stub area.

Note that external LSAs are also in the AS-scope Link State Database."

REFERENCE

"OSPF Version 2, [Section 12](#) Link State Advertisements"

::= { ospf 12 }

```
ospfExtLsdbEntry OBJECT-TYPE
    SYNTAX          OspfExtLsdbEntry
    MAX-ACCESS      not-accessible
    STATUS           deprecated
    DESCRIPTION
        "A single Link State Advertisement."
    INDEX { ospfExtLsdbType, ospfExtLsdbLsid, ospfExtLsdbRouterId }
    ::= { ospfExtLsdbTable 1 }
```

```
OspfExtLsdbEntry ::=
    SEQUENCE {
        ospfExtLsdbType
            INTEGER,
        ospfExtLsdbLsid
            IpAddress,
        ospfExtLsdbRouterId
            RouterID,
        ospfExtLsdbSequence
            Integer32,
        ospfExtLsdbAge
            Integer32,
```

```

ospfExtLsdbChecksum
    Integer32,
ospfExtLsdbAdvertisement
    OCTET STRING
}

```

```

ospfExtLsdbType OBJECT-TYPE
    SYNTAX          INTEGER {
                        asExternalLink (5)
                    }
    MAX-ACCESS      read-only -- read-only since originally an
                        -- SMiv1 index
    STATUS          deprecated
    DESCRIPTION
        "The type of the link state advertisement.
        Each link state type has a separate advertisement
        format."
    REFERENCE
        "OSPF Version 2, Appendix A.4.1 The Link State
        Advertisement header"

```

Internet Draft

Expires November 2006

[Page 58]

OSPFv2 MIB

May 2006

```

 ::= { ospfExtLsdbEntry 1 }

```

```

ospfExtLsdbLsid OBJECT-TYPE
    SYNTAX          IpAddress
    MAX-ACCESS      read-only -- read-only since originally an
                        -- SMiv1 index
    STATUS          deprecated
    DESCRIPTION
        "The Link State ID is an LS Type Specific field
        containing either a Router ID or an IP Address;
        it identifies the piece of the routing domain
        that is being described by the advertisement."
    REFERENCE
        "OSPF Version 2, Section 12.1.4 Link State ID"
 ::= { ospfExtLsdbEntry 2 }

```

```

ospfExtLsdbRouterId OBJECT-TYPE
    SYNTAX          RouterID
    MAX-ACCESS      read-only -- read-only since originally an
                        -- SMiv1 index
    STATUS          deprecated
    DESCRIPTION
        "The 32 bit number that uniquely identifies the

```

originating router in the Autonomous System."
REFERENCE
"OSPF Version 2, [Appendix C.1](#) Global parameters"
::= { ospfExtLsdbEntry 3 }

ospfExtLsdbSequence OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS deprecated
DESCRIPTION
"The sequence number field is a signed 32-bit integer. It starts with the value '80000001'h, or -'7FFFFFFF'h, and increments until '7FFFFFFF'h. Thus, a typical sequence number will be very negative. It is used to detect old and duplicate link state advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number the more recent the advertisement."
REFERENCE
"OSPF Version 2, Section 12.1.6 LS sequence number"
::= { ospfExtLsdbEntry 4 }

ospfExtLsdbAge OBJECT-TYPE

SYNTAX Integer32 -- Should be 0..MaxAge, except when
-- doNotAge bit is set
UNITS "seconds"
MAX-ACCESS read-only
STATUS deprecated
DESCRIPTION

"This field is the age of the link state advertisement in seconds."
REFERENCE
"OSPF Version 2, [Section 12.1.1](#) LS age"
::= { ospfExtLsdbEntry 5 }

ospfExtLsdbChecksum OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS deprecated
DESCRIPTION
"This field is the checksum of the complete contents of the advertisement, excepting the

age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum."

REFERENCE

"OSPF Version 2, [Section 12.1.7](#) LS checksum"

::= { ospfExtLsdbEntry 6 }

ospfExtLsdbAdvertisement OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(36))

MAX-ACCESS read-only

STATUS deprecated

DESCRIPTION

"The entire Link State Advertisement, including its header."

REFERENCE

"OSPF Version 2, [Section 12](#) Link State Advertisements"

::= { ospfExtLsdbEntry 7 }

-- OSPF Use of the CIDR Route Table

ospfRouteGroup OBJECT IDENTIFIER ::= { ospf 13 }

-- The IP Forwarding Table defines a number of objects for use by
-- the routing protocol to externalize its information. Most of
-- the variables (ipForwardDest, ipForwardMask, ipForwardPolicy,
-- ipForwardNextHop, ipForwardIfIndex, ipForwardType,
-- ipForwardProto, ipForwardAge, and ipForwardNextHopAS) are
-- defined there.

-- Those that leave some discretion are defined here.

-- ipCidrRouteProto is, of course, ospf (13).

-- ipCidrRouteAge is the time since the route was first
-- calculated, as opposed to the time since the last SPF run.

-- ipCidrRouteInfo is an OBJECT IDENTIFIER for use by the routing
-- protocol. The following values shall be found there depending


```

--      on the way the route was calculated.

ospfIntraArea      OBJECT IDENTIFIER ::= { ospfRouteGroup 1 }
ospfInterArea      OBJECT IDENTIFIER ::= { ospfRouteGroup 2 }
ospfExternalType1  OBJECT IDENTIFIER ::= { ospfRouteGroup 3 }
ospfExternalType2  OBJECT IDENTIFIER ::= { ospfRouteGroup 4 }

--      ipCidrRouteMetric1 is, by definition, the primary routing
--      metric. Therefore, it should be the metric that route
--      selection is based on. For intra-area and inter-area routes,
--      it is an OSPF metric. For External Type 1 (comparable value)
--      routes, it is an OSPF metric plus the External Metric. For
--      external Type 2 (non-comparable value) routes, it is the
--      external metric.

--      ipCidrRouteMetric2 is, by definition, a secondary routing
--      metric. Therefore, it should be the metric that breaks a tie
--      among routes having equal metric1 values and the same
--      calculation rule. For intra-area, inter-area routes, and
--      External Type 1 (comparable value) routes, it is unused. For
--      external Type 2 (non-comparable value) routes, it is the metric
--      to the AS border router.

--      ipCidrRouteMetric3, ipCidrRouteMetric4, and ipCidrRouteMetric5
--      are unused.

--      The OSPF Area Aggregate Table
--
--      This table replaces the OSPF Area Summary Table, being an
--      extension of that for CIDR routers.

ospfAreaAggregateTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF OspfAreaAggregateEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Area Aggregate Table acts as an adjunct
        to the Area Table. It describes those address aggregates
        that are configured to be propagated from an Area.
        Its purpose is to reduce the amount of information
        which is known beyond Area's borders.

        It contains a set of IP address ranges
        specified by an IP address/IP network mask pair.
        For example, class B address range of X.X.X.X
        with a network mask of 255.255.0.0 includes all IP
        addresses from X.X.0.0 to X.X.255.255.

        Note that if ranges are configured such that one range
        subsumes another range (e.g., 10.0.0.0 mask 255.0.0.0

```

OSPFv2 MIB

May 2006

and 10.1.0.0 mask 255.255.0.0),
the most specific match is the preferred one."

REFERENCE

"OSPF Version 2, [Appendix C.2](#) Area parameters"
::= { ospf 14 }

ospfAreaAggregateEntry OBJECT-TYPE

SYNTAX OspfAreaAggregateEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A single area aggregate entry.

Information in this table is persistent and when this object
is written the entity SHOULD save the change to non-volatile
storage."

REFERENCE

"OSPF Version 2, [Appendix C.2](#) Area parameters"

INDEX { ospfAreaAggregateAreaID, ospfAreaAggregateLsdbType,
ospfAreaAggregateNet, ospfAreaAggregateMask }

::= { ospfAreaAggregateTable 1 }

OspfAreaAggregateEntry ::=

SEQUENCE {

ospfAreaAggregateAreaID
AreaID,

ospfAreaAggregateLsdbType
INTEGER,

ospfAreaAggregateNet
IpAddress,

ospfAreaAggregateMask
IpAddress,

ospfAreaAggregateStatus
RowStatus,

ospfAreaAggregateEffect
INTEGER,

ospfAreaAggregateExtRouteTag
Unsigned32

}

ospfAreaAggregateAreaID OBJECT-TYPE

SYNTAX AreaID

MAX-ACCESS read-only -- read-only since originally an

DESCRIPTION

"The Subnet Mask that pertains to the Net or Subnet."

REFERENCE

"OSPF Version 2, [Appendix C.2](#) Area parameters"

::= { ospfAreaAggregateEntry 4 }

ospfAreaAggregateStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object permits management of the table by facilitating actions such as row creation, construction and destruction.

The value of this object has no effect on whether other objects in this conceptual row can be modified."

::= { ospfAreaAggregateEntry 5 }

ospfAreaAggregateEffect OBJECT-TYPE

SYNTAX INTEGER {
 advertiseMatching (1),
 doNotAdvertiseMatching (2)
}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Subnets subsumed by ranges either trigger the advertisement of the indicated aggregate (advertiseMatching), or result in the subnet's not being advertised at all outside the area."

DEFVAL { advertiseMatching }

::= { ospfAreaAggregateEntry 6 }

ospfAreaAggregateExtRouteTag OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"External Route Tag to be included in NSSA (type-7) LSAs."

```

DEFVAL { 0 }
::= { ospfAreaAggregateEntry 7 }

-- OSPF Link State Database, Link-Local for non-virtual links

ospfLocalLsdbTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF OspfLocalLsdbEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "The OSPF Process's Link-Local Link State Database
        for non-virtual links.
        This table is identical to the OSPF LSDB Table
        in format, but contains only Link-Local Link State
        Advertisements for non-virtual links. The purpose is
        to allow Link-Local LSAs to be displayed for each
        non-virtual interface. This table is implemented to
        support type-9 LSAs which are defined
        in 'The OSPF Opaque LSA Option'"
    REFERENCE
        "OSPF Version 2, Section 12 Link State Advertisements
        and The OSPF Opaque LSA Option"
    ::= { ospf 17 }

ospfLocalLsdbEntry OBJECT-TYPE
    SYNTAX          OspfLocalLsdbEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION

```

```

        "A single Link State Advertisement."
    INDEX { ospfLocalLsdbIpAddress, ospfLocalLsdbAddressLessIf,
            ospfLocalLsdbType, ospfLocalLsdbLsid, ospfLocalLsdbRouterId
        }
    ::= { ospfLocalLsdbTable 1 }

OspfLocalLsdbEntry ::=
    SEQUENCE {
        ospfLocalLsdbIpAddress
            IpAddress,
        ospfLocalLsdbAddressLessIf
            InterfaceIndexOrZero,
        ospfLocalLsdbType

```

```

        INTEGER,
ospfLocalLsdbLsid
        IPAddress,
ospfLocalLsdbRouterId
        RouterID,
ospfLocalLsdbSequence
        Integer32,
ospfLocalLsdbAge
        Integer32,
ospfLocalLsdbChecksum
        Integer32,
ospfLocalLsdbAdvertisement
        OCTET STRING
    }

```

ospfLocalLsdbIpAddress OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The IP Address of the interface from
which the LSA was received if the interface is
numbered."

REFERENCE

"OSPF Version 2, [Appendix C.3](#) Interface parameters"

::= { ospfLocalLsdbEntry 1 }

ospfLocalLsdbAddressLessIf OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Interface Index of the interface from
which the LSA was received if the interface is
unnumbered."

REFERENCE

"OSPF Version 2, [Appendix C.3](#) Interface parameters"

::= { ospfLocalLsdbEntry 2 }

ospfLocalLsdbType OBJECT-TYPE

SYNTAX INTEGER { localOpaqueLink (9) }

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The type of the link state advertisement.
Each link state type has a separate
advertisement format."

REFERENCE

"OSPF Version 2, [Appendix A.4.1](#) The Link State
Advertisement header and "

::= { ospfLocalLsdbEntry 3 }

ospfLocalLsdbLsid OBJECT-TYPE

SYNTAX IpAddress
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"The Link State ID is an LS Type Specific field
containing a 32 bit identifier in IP address format;
it identifies the piece of the routing domain
that is being described by the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.4](#) Link State ID"

::= { ospfLocalLsdbEntry 4 }

ospfLocalLsdbRouterId OBJECT-TYPE

SYNTAX RouterID
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"The 32 bit number that uniquely identifies the
originating router in the Autonomous System."

REFERENCE

"OSPF Version 2, [Appendix C.1](#) Global parameters"

::= { ospfLocalLsdbEntry 5 }

ospfLocalLsdbSequence OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The sequence number field is a signed 32-bit
integer. It starts with the value '80000001'h,
or -'7FFFFFFF'h, and increments until '7FFFFFFF'h.
Thus, a typical sequence number will be very negative.
It is used to detect old and duplicate link state
advertisements. The space of sequence numbers is linearly
ordered. The larger the sequence number the more recent
the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.6](#) LS sequence
number"

::= { ospfLocalLsdbEntry 6 }

OSPFv2 MIB

May 2006

ospfLocalLsdbAge OBJECT-TYPE

SYNTAX Integer32 -- Should be 0..MaxAge, except when
-- doNotAge bit is set

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the age of the link state advertisement in seconds."

REFERENCE

"OSPF Version 2, [Section 12.1.1](#) LS age"

::= { ospfLocalLsdbEntry 7 }

ospfLocalLsdbChecksum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum."

REFERENCE

"OSPF Version 2, [Section 12.1.7](#) LS checksum"

::= { ospfLocalLsdbEntry 8 }

ospfLocalLsdbAdvertisement OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (1..65535))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The entire Link State Advertisement, including its header."

Note that for variable length LSAs, SNMP agents may not be able to return the largest string size."

REFERENCE

"OSPF Version 2, [Section 12](#) Link State


```
    Advertisements"
 ::= { ospfLocalLsdbEntry 9 }
```

-- OSPF Link State Database, Link-Local for virtual Links

```
ospfVirtLocalLsdbTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF OspfVirtLocalLsdbEntry
    MAX-ACCESS  not-accessible
    STATUS      current
```

Internet Draft

Expires November 2006

[Page 67]

OSPFv2 MIB

May 2006

DESCRIPTION

"The OSPF Process's Link-Local Link State Database for virtual links.

This table is identical to the OSPF LSDB Table in format, but contains only Link-Local Link State Advertisements for virtual links. The purpose is to allow Link-Local LSAs to be displayed for each virtual interface. This table is implemented to support type-9 LSAs which are defined in 'The OSPF Opaque LSA Option'

REFERENCE

"OSPF Version 2, [Section 12](#) Link State Advertisements and The OSPF Opaque LSA Option"

```
::= { ospf 18 }
```

```
ospfVirtLocalLsdbEntry OBJECT-TYPE
    SYNTAX      OspfVirtLocalLsdbEntry
    MAX-ACCESS  not-accessible
    STATUS      current
```

DESCRIPTION

"A single Link State Advertisement."

```
INDEX { ospfVirtLocalLsdbTransitArea,
        ospfVirtLocalLsdbNeighbor,
        ospfVirtLocalLsdbType,
        ospfVirtLocalLsdbLsid,
        ospfVirtLocalLsdbRouterId
      }
```

```
::= { ospfVirtLocalLsdbTable 1 }
```

```
OspfVirtLocalLsdbEntry ::=
    SEQUENCE {
        ospfVirtLocalLsdbTransitArea
        AreaID,
```

```

ospfVirtLocalLsdbNeighbor
  RouterID,
ospfVirtLocalLsdbType
  INTEGER,
ospfVirtLocalLsdbLsid
  IPAddress,
ospfVirtLocalLsdbRouterId
  RouterID,
ospfVirtLocalLsdbSequence
  Integer32,
ospfVirtLocalLsdbAge
  Integer32,
ospfVirtLocalLsdbChecksum
  Integer32,
ospfVirtLocalLsdbAdvertisement
  OCTET STRING
}

```

```

ospfVirtLocalLsdbTransitArea OBJECT-TYPE
    SYNTAX      AreaID

```

Internet Draft

Expires November 2006

[Page 68]

OSPFv2 MIB

May 2006

```

MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "The Transit Area that the Virtual Link
    traverses. By definition, this is not 0.0.0.0"
REFERENCE
    "OSPF Version 2, Appendix C.3 Interface parameters"
 ::= { ospfVirtLocalLsdbEntry 1 }

```

```

ospfVirtLocalLsdbNeighbor OBJECT-TYPE
    SYNTAX      RouterID
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Router ID of the Virtual Neighbor."
    REFERENCE
        "OSPF Version 2, Appendix C.3 Interface parameters"
 ::= { ospfVirtLocalLsdbEntry 2 }

```

```

ospfVirtLocalLsdbType OBJECT-TYPE
    SYNTAX      INTEGER { localOpaqueLink (9) }
    MAX-ACCESS  not-accessible
    STATUS      current

```

DESCRIPTION

"The type of the link state advertisement.
Each link state type has a separate
advertisement format."

REFERENCE

"OSPF Version 2, [Appendix A.4.1](#) The Link State
Advertisement header"

::= { ospfVirtLocalLsdbEntry 3 }

ospfVirtLocalLsdbLsid OBJECT-TYPE

SYNTAX IpAddress
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"The Link State ID is an LS Type Specific field
containing a 32 bit identifier in IP address format;
it identifies the piece of the routing domain
that is being described by the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.4](#) Link State ID"

::= { ospfVirtLocalLsdbEntry 4 }

ospfVirtLocalLsdbRouterId OBJECT-TYPE

SYNTAX RouterID
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"The 32 bit number that uniquely identifies the
originating router in the Autonomous System."

REFERENCE

"OSPF Version 2, [Appendix C.1](#) Global parameters"
::= { ospfVirtLocalLsdbEntry 5 }

ospfVirtLocalLsdbSequence OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The sequence number field is a signed 32-bit
integer. It starts with the value '80000001'h,
or -'7FFFFFFF'h, and increments until '7FFFFFFF'h.
Thus, a typical sequence number will be very negative.
It is used to detect old and duplicate link state

advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number the more recent the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.6](#) LS sequence number"

::= { ospfVirtLocalLsdbEntry 6 }

ospfVirtLocalLsdbAge OBJECT-TYPE

SYNTAX Integer32 -- Should be 0..MaxAge, except when
-- doNotAge bit is set

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the age of the link state advertisement in seconds."

REFERENCE

"OSPF Version 2, [Section 12.1.1](#) LS age"

::= { ospfVirtLocalLsdbEntry 7 }

ospfVirtLocalLsdbChecksum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum."

REFERENCE

"OSPF Version 2, [Section 12.1.7](#) LS checksum"

::= { ospfVirtLocalLsdbEntry 8 }

ospfVirtLocalLsdbAdvertisement OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (1..65535))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The entire Link State Advertisement, including its header."

REFERENCE

"OSPF Version 2, [Section 12](#) Link State Advertisements.

Note that for variable length LSAs, SNMP agents may not be able to return the largest string size."

::= { ospfVirtLocalLsdbEntry 9 }

-- OSPF Link State Database, AS-scope

ospfAsLsdbTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfAsLsdbEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The OSPF Process's AS-scope LSA Link State Database. The Database contains the AS-scope Link State Advertisements from throughout the areas that the device is attached to.

This table is identical to the OSPF LSDB Table in format, but contains only AS-scope Link State Advertisements. The purpose is to allow AS-scope LSAs to be displayed once for the router rather than once in each non-stub area."

REFERENCE

"OSPF Version 2, [Section 12](#) Link State Advertisements"

::= { ospf 19 }

ospfAsLsdbEntry OBJECT-TYPE

SYNTAX OspfAsLsdbEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A single Link State Advertisement."

INDEX { ospfAsLsdbType, ospfAsLsdbLsid, ospfAsLsdbRouterId }

::= { ospfAsLsdbTable 1 }

OspfAsLsdbEntry ::=

SEQUENCE {

ospfAsLsdbType

INTEGER,

ospfAsLsdbLsid

IpAddress,

ospfAsLsdbRouterId

RouterID,

ospfAsLsdbSequence

OSPFv2 MIB

May 2006

```
        Integer32,
ospfAsLsdbAge
        Integer32,
ospfAsLsdbChecksum
        Integer32,
ospfAsLsdbAdvertisement
        OCTET STRING
    }
```

ospfAsLsdbType OBJECT-TYPE

```
SYNTAX      INTEGER {
                    asExternalLink (5),
                    asOpaqueLink   (11)
                }
```

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

```
STATUS      current
```

DESCRIPTION

"The type of the link state advertisement.
Each link state type has a separate
advertisement format."

REFERENCE

"OSPF Version 2, [Appendix A.4.1](#) The Link State
Advertisement header"

```
::= { ospfAsLsdbEntry 1 }
```

ospfAsLsdbLsid OBJECT-TYPE

```
SYNTAX      IpAddress
```

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

```
STATUS      current
```

DESCRIPTION

"The Link State ID is an LS Type Specific field
containing either a Router ID or an IP Address;
it identifies the piece of the routing domain
that is being described by the advertisement."

REFERENCE

"OSPF Version 2, [Section 12.1.4](#) Link State ID"

```
::= { ospfAsLsdbEntry 2 }
```

ospfAsLsdbRouterId OBJECT-TYPE

```
SYNTAX      RouterID
```

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

```
STATUS      current
```

DESCRIPTION

"The 32 bit number that uniquely identifies the originating router in the Autonomous System."

REFERENCE

"OSPF Version 2, [Appendix C.1](#) Global parameters"

::= { ospfAsLsdbEntry 3 }

ospfAsLsdbSequence OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

Internet Draft

Expires November 2006

[Page 72]

OSPFv2 MIB

May 2006

DESCRIPTION

"The sequence number field is a signed 32-bit integer. It starts with the value '80000001'h, or -'7FFFFFFF'h, and increments until '7FFFFFFF'h. Thus, a typical sequence number will be very negative. It is used to detect old and duplicate link state advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number the more recent the advertisement."

REFERENCE

"OSPF Version 2, Section 12.1.6 LS sequence number"

::= { ospfAsLsdbEntry 4 }

ospfAsLsdbAge OBJECT-TYPE

SYNTAX Integer32 -- Should be 0..MaxAge, except when
-- doNotAge bit is set

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the age of the link state advertisement in seconds."

REFERENCE

"OSPF Version 2, [Section 12.1.1](#) LS age"

::= { ospfAsLsdbEntry 5 }

ospfAsLsdbChecksum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This field is the checksum of the complete

contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum."

REFERENCE

"OSPF Version 2, [Section 12.1.7](#) LS checksum"

::= { ospfAsLsdbEntry 6 }

ospfAsLsdbAdvertisement OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (1..65535))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The entire Link State Advertisement, including its header."

REFERENCE

"OSPF Version 2, [Section 12](#) Link State

Advertisements.

Note that for variable length LSAs, SNMP agents may not be able to return the largest string size."

::= { ospfAsLsdbEntry 7 }

-- OSPF Area LSA Counter Table

ospfAreaLsaCountTable OBJECT-TYPE

SYNTAX SEQUENCE OF OspfAreaLsaCountEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table maintains per area per lsa type counters"

::= { ospf 20 }

ospfAreaLsaCountEntry OBJECT-TYPE

SYNTAX OspfAreaLsaCountEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry with a number of link advertisements


```

        of a given type for a given area."
INDEX { ospfAreaLsaCountAreaId, ospfAreaLsaCountLsaType }
 ::= { ospfAreaLsaCountTable 1 }

```

```

OspfAreaLsaCountEntry ::=
    SEQUENCE {
        ospfAreaLsaCountAreaId
            AreaID,
        ospfAreaLsaCountLsaType
            INTEGER,
        ospfAreaLsaCountNumber
            Gauge32
    }

```

```

ospfAreaLsaCountAreaId OBJECT-TYPE
    SYNTAX      AreaID
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This entry Area ID."
    ::= { ospfAreaLsaCountEntry 1 }

```

```

ospfAreaLsaCountLsaType OBJECT-TYPE
    SYNTAX      INTEGER {
        routerLink (1),
        networkLink (2),
        summaryLink (3),
        asSummaryLink (4),
        multicastLink (6),
        nssaExternalLink (7),

```

```

        areaOpaqueLink (10)
    }
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This entry LSA type."
    ::= { ospfAreaLsaCountEntry 2 }

```

```

ospfAreaLsaCountNumber OBJECT-TYPE
    SYNTAX      Gauge32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION

```

```

        "Number of LSAs of a given type for a given area."
        ::= { ospfAreaLsaCountEntry 3 }

-- conformance information

ospfConformance OBJECT IDENTIFIER ::= { ospf 15 }

ospfGroups      OBJECT IDENTIFIER ::= { ospfConformance 1 }
ospfCompliances OBJECT IDENTIFIER ::= { ospfConformance 2 }

-- compliance statements

ospfCompliance MODULE-COMPLIANCE
    STATUS      deprecated
    DESCRIPTION
        "The compliance statement for OSPF systems
        conforming to RFC 1850."
    MODULE      -- this module
    MANDATORY-GROUPS {
        ospfBasicGroup,
        ospfAreaGroup,
        ospfStubAreaGroup,
        ospfIfGroup,
        ospfIfMetricGroup,
        ospfVirtIfGroup,
        ospfNbrGroup,
        ospfVirtNbrGroup,
        ospfAreaAggregateGroup
    }
    GROUP ospfHostGroup
    DESCRIPTION
        "This group is mandatory for OSPF systems that support
        attached hosts."
    GROUP ospfLsdbGroup
    DESCRIPTION
        "This group is mandatory for OSPF systems that display
        their per-area link state database."
    GROUP ospfExtLsdbGroup
    DESCRIPTION
        "This group is mandatory for OSPF systems that display

```

```

        their External link state database."
        ::= { ospfCompliances 1 }

```

```

ospfCompliance2 MODULE-COMPLIANCE
    STATUS          current
    DESCRIPTION
        "The compliance statement."
    MODULE          -- this module
    MANDATORY-GROUPS {
        ospfBasicGroup2,
        ospfAreaGroup2,
        ospfStubAreaGroup,
        ospfIfGroup2,
        ospfIfMetricGroup,
        ospfVirtIfGroup2,
        ospfNbrGroup2,
        ospfVirtNbrGroup2,
        ospfAreaAggregateGroup2
    }
    GROUP ospfHostGroup2
        DESCRIPTION
            "This group is mandatory for OSPF systems that support
            attached hosts."
    GROUP ospfLsdbGroup
        DESCRIPTION
            "This group is mandatory for OSPF systems that display
            their per-area link state database."
    GROUP ospfAsLsdbGroup
        DESCRIPTION
            "This group is mandatory for OSPF systems that display
            their AS-scope link state database."
    GROUP ospfLocalLsdbGroup
        DESCRIPTION
            "This group is mandatory for OSPF systems that display
            their per-link link state database for non-virtual
            links."
    GROUP ospfVirtLocalLsdbGroup
        DESCRIPTION
            "This group is mandatory for OSPF systems that display
            their per-link link state database for virtual links."
    GROUP ospfAreaLsaCountGroup
        DESCRIPTION
            "This group is mandatory for OSPF systems that display
            per area per LSA type counters."
    ::= { ospfCompliances 2 }

```

```

ospfComplianceObsolete MODULE-COMPLIANCE
    STATUS          obsolete
    DESCRIPTION
        "Contains obsolete object groups."
    MODULE          -- this module
    GROUP ospfAreaRangeGroup
        DESCRIPTION

```

OSPFv2 MIB

May 2006

"This group is obsolete and it is mandatory only
for non-CIDR OSPF systems that support multiple areas."
GROUP ospfObsoleteGroup
DESCRIPTION
"This group contains obsolete objects,
which are no longer required for OSPF systems."
::= { ospfCompliances 3 }

-- units of conformance

ospfBasicGroup OBJECT-GROUP
OBJECTS {
ospfRouterId,
ospfAdminStat,
ospfVersionNumber,
ospfAreaBdrRtrStatus,
ospfASBdrRtrStatus,
ospfExternLsaCount,
ospfExternLsaCksumSum,
ospfTOSSupport,
ospfOriginateNewLsas,
ospfRxNewLsas,
ospfExtLsdbLimit,
ospfMulticastExtensions,
ospfExitOverflowInterval,
ospfDemandExtensions
}
STATUS deprecated
DESCRIPTION
"These objects are used to monitor/manage
global OSPF parameters. This object group
conforms to [RFC 1850](#)."
::= { ospfGroups 1 }

ospfAreaGroup OBJECT-GROUP
OBJECTS {
ospfAreaId,
ospfImportAsExtern,
ospfSpfRuns,
ospfAreaBdrRtrCount,
ospfAsBdrRtrCount,
ospfAreaLsaCount,

```

        ospfAreaLsaCksumSum,
        ospfAreaSummary,
        ospfAreaStatus
    }
    STATUS          deprecated
    DESCRIPTION
        "These objects are used for OSPF systems
        supporting areas per RFC 1850."
    ::= { ospfGroups 2 }

```

```

ospfStubAreaGroup    OBJECT-GROUP
    OBJECTS {
        ospfStubAreaId,
        ospfStubTOS,
        ospfStubMetric,
        ospfStubStatus,
        ospfStubMetricType
    }
    STATUS          current
    DESCRIPTION
        "These objects are used for OSPF systems
        supporting stub areas."
    ::= { ospfGroups 3 }

```

```

ospfLsdbGroup        OBJECT-GROUP
    OBJECTS {
        ospfLsdbAreaId,
        ospfLsdbType,
        ospfLsdbLsid,
        ospfLsdbRouterId,
        ospfLsdbSequence,
        ospfLsdbAge,
        ospfLsdbChecksum,
        ospfLsdbAdvertisement
    }
    STATUS          current
    DESCRIPTION
        "These objects are used for OSPF systems
        that display their link state database."
    ::= { ospfGroups 4 }

```

```

ospfAreaRangeGroup    OBJECT-GROUP
    OBJECTS {

```

```

        ospfAreaRangeAreaId,
        ospfAreaRangeNet,
        ospfAreaRangeMask,
        ospfAreaRangeStatus,
        ospfAreaRangeEffect
    }
    STATUS    obsolete
    DESCRIPTION
        "These objects are used for non-CIDR OSPF
        systems that support multiple areas. This
        object group is obsolete."
    ::= { ospfGroups 5 }

```

```

ospfHostGroup    OBJECT-GROUP
    OBJECTS {
        ospfHostIpAddress,
        ospfHostTOS,
        ospfHostMetric,
        ospfHostStatus,
        ospfHostAreaID
    }

```

```

    }
    STATUS    deprecated
    DESCRIPTION
        "These objects are used for OSPF systems
        that support attached hosts."
    ::= { ospfGroups 6 }

```

```

ospfIfGroup    OBJECT-GROUP
    OBJECTS {
        ospfIfIpAddress,
        ospfAddressLessIf,
        ospfIfAreaId,
        ospfIfType,
        ospfIfAdminStat,
        ospfIfRtrPriority,
        ospfIfTransitDelay,
        ospfIfRetransInterval,
        ospfIfHelloInterval,
        ospfIfRtrDeadInterval,
        ospfIfPollInterval,
        ospfIfState,
        ospfIfDesignatedRouter,
        ospfIfBackupDesignatedRouter,
    }

```

```

    ospfIfEvents,
    ospfIfAuthType,
    ospfIfAuthKey,
    ospfIfStatus,
    ospfIfMulticastForwarding,
    ospfIfDemand
}
STATUS      deprecated
DESCRIPTION
    "These objects are used to monitor/manage OSPF
    interfaces. This object group conforms to RFC 1850."
::= { ospfGroups 7 }

```

```

ospfIfMetricGroup    OBJECT-GROUP
OBJECTS {
    ospfIfMetricIpAddress,
    ospfIfMetricAddressLessIf,
    ospfIfMetricTOS,
    ospfIfMetricValue,
    ospfIfMetricStatus
}
STATUS      current
DESCRIPTION
    "These objects are used for OSPF systems for supporting
    interface metrics."
::= { ospfGroups 8 }

```

```

ospfVirtIfGroup      OBJECT-GROUP
OBJECTS {
    ospfVirtIfAreaId,

```

```

    ospfVirtIfNeighbor,
    ospfVirtIfTransitDelay,
    ospfVirtIfRetransInterval,
    ospfVirtIfHelloInterval,
    ospfVirtIfRtrDeadInterval,
    ospfVirtIfState,
    ospfVirtIfEvents,
    ospfVirtIfAuthType,
    ospfVirtIfAuthKey,
    ospfVirtIfStatus
}
STATUS      deprecated
DESCRIPTION

```

"These objects are used for OSPF systems for supporting virtual interfaces. This object group conforms to [RFC 1850](#)."

::= { ospfGroups 9 }

ospfNbrGroup OBJECT-GROUP

OBJECTS {
ospfNbrIpAddress,
ospfNbrAddressLessIndex,
ospfNbrRtrId,
ospfNbrOptions,
ospfNbrPriority,
ospfNbrState,
ospfNbrEvents,
ospfNbrLsRetransQLen,
ospfNbmaNbrStatus,
ospfNbmaNbrPermanence,
ospfNbrHelloSuppressed
}

STATUS deprecated

DESCRIPTION

"These objects are used to monitor/manage OSPF neighbors. This object group conforms to [RFC 1850](#)."

::= { ospfGroups 10 }

ospfVirtNbrGroup OBJECT-GROUP

OBJECTS {
ospfVirtNbrArea,
ospfVirtNbrRtrId,
ospfVirtNbrIpAddress,
ospfVirtNbrOptions,
ospfVirtNbrState,
ospfVirtNbrEvents,
ospfVirtNbrLsRetransQLen,
ospfVirtNbrHelloSuppressed
}

STATUS deprecated

DESCRIPTION

"These objects are used to monitor/manage OSPF virtual neighbors. This object group conforms to [RFC 1850](#)."

::= { ospfGroups 11 }

ospfExtLsdbGroup OBJECT-GROUP


```

OBJECTS {
    ospfExtLsdbType,
    ospfExtLsdbLsid,
    ospfExtLsdbRouterId,
    ospfExtLsdbSequence,
    ospfExtLsdbAge,
    ospfExtLsdbChecksum,
    ospfExtLsdbAdvertisement
}
STATUS      deprecated
DESCRIPTION
    "These objects are used for OSPF systems
    that display their link state database. This object
    group conforms to RFC 1850.

    This object group is replaced by the ospfAsLsdbGroup
    in order to support any AS-scope LSA type in a single
    table."
::= { ospfGroups 12 }

```

```

ospfAreaAggregateGroup    OBJECT-GROUP
OBJECTS {
    ospfAreaAggregateAreaID,
    ospfAreaAggregateLsdbType,
    ospfAreaAggregateNet,
    ospfAreaAggregateMask,
    ospfAreaAggregateStatus,
    ospfAreaAggregateEffect
}
STATUS      deprecated
DESCRIPTION
    "These objects are used for OSPF systems to support
    network prefix aggregation across areas."
::= { ospfGroups 13 }

```

```

ospfLocalLsdbGroup    OBJECT-GROUP
OBJECTS {
    ospfLocalLsdbSequence,
    ospfLocalLsdbAge,
    ospfLocalLsdbChecksum,
    ospfLocalLsdbAdvertisement
}
STATUS      current
DESCRIPTION
    "These objects are used for OSPF systems
    that display their Link-Local link state databases
    for non-virtual links."
::= { ospfGroups 14 }

```

```

ospfVirtLocalLsdbGroup    OBJECT-GROUP

```

OSPFv2 MIB

May 2006

```
OBJECTS {
    ospfVirtLocalLsdbSequence,
    ospfVirtLocalLsdbAge,
    ospfVirtLocalLsdbChecksum,
    ospfVirtLocalLsdbAdvertisement
}
STATUS          current
DESCRIPTION
    "These objects are used for OSPF systems
    that display their Link-Local link state databases
    for virtual links."
 ::= { ospfGroups 15 }

ospfAsLsdbGroup    OBJECT-GROUP
OBJECTS {
    ospfAsLsdbSequence,
    ospfAsLsdbAge,
    ospfAsLsdbChecksum,
    ospfAsLsdbAdvertisement
}
STATUS          current
DESCRIPTION
    "These objects are used for OSPF systems
    that display their AS-scope link state database."
 ::= { ospfGroups 16 }

ospfBasicGroup2    OBJECT-GROUP
OBJECTS {
    ospfRouterId,
    ospfAdminStat,
    ospfVersionNumber,
    ospfAreaBdrRtrStatus,
    ospfASBdrRtrStatus,
    ospfExternLsaCount,
    ospfExternLsaCksumSum,
    ospfTOSSupport,
    ospfOriginateNewLsas,
    ospfRxNewLsas,
    ospfExtLsdbLimit,
    ospfMulticastExtensions,
    ospfExitOverflowInterval,
    ospfDemandExtensions,
    ospfRFC1583Compatibility,
```

```

ospfOpaqueLsaSupport,
ospfReferenceBandwidth,
ospfRestartSupport,
ospfRestartInterval,
ospfRestartStrictLsaChecking,
ospfRestartStatus,
ospfRestartAge,
ospfRestartExitReason,
ospfAsLsaCount,
ospfAsLsaCksumSum,

```

OSPFv2 MIB

May 2006

```

ospfStubRouterSupport,
ospfStubRouterAdvertisement,
ospfDiscontinuityTime
}
STATUS      current
DESCRIPTION
    "These objects are used to monitor/manage OSPF global
    parameters."
 ::= { ospfGroups 17 }

```

```

ospfAreaGroup2      OBJECT-GROUP
    OBJECTS {
        ospfAreaId,
        ospfImportAsExtern,
        ospfSpfRuns,
        ospfAreaBdrRtrCount,
        ospfAsBdrRtrCount,
        ospfAreaLsaCount,
        ospfAreaLsaCksumSum,
        ospfAreaSummary,
        ospfAreaStatus,
        ospfAreaNssaTranslatorRole,
        ospfAreaNssaTranslatorState,
        ospfAreaNssaTranslatorStabilityInterval,
        ospfAreaNssaTranslatorEvents
    }
    STATUS      current
    DESCRIPTION
        "These objects are used by OSPF systems
        to support areas."
    ::= { ospfGroups 18 }

```

```

ospfIfGroup2      OBJECT-GROUP

```

```

OBJECTS {
    ospfIfIpAddress,
    ospfAddressLessIf,
    ospfIfAreaId,
    ospfIfType,
    ospfIfAdminStat,
    ospfIfRtrPriority,
    ospfIfTransitDelay,
    ospfIfRetransInterval,
    ospfIfHelloInterval,
    ospfIfRtrDeadInterval,
    ospfIfPollInterval,
    ospfIfState,
    ospfIfDesignatedRouter,
    ospfIfBackupDesignatedRouter,
    ospfIfEvents,
    ospfIfAuthType,
    ospfIfAuthKey,
    ospfIfStatus,
    ospfIfMulticastForwarding,

```

```

    ospfIfDemand,
    ospfIfLsaCount,
    ospfIfLsaCksumSum
}

```

STATUS current

DESCRIPTION

"These objects are used to monitor/manage OSPF interfaces."
 ::= { ospfGroups 19 }

ospfVirtIfGroup2 OBJECT-GROUP

```

OBJECTS {
    ospfVirtIfAreaId,
    ospfVirtIfNeighbor,
    ospfVirtIfTransitDelay,
    ospfVirtIfRetransInterval,
    ospfVirtIfHelloInterval,
    ospfVirtIfRtrDeadInterval,
    ospfVirtIfState,
    ospfVirtIfEvents,
    ospfVirtIfAuthType,
    ospfVirtIfAuthKey,
    ospfVirtIfStatus,
    ospfVirtIfLsaCount,

```

```

        ospfVirtIfLsaCksumSum,
        ospfIfDesignatedRouterId,
        ospfIfBackupDesignatedRouterId
    }
STATUS          current
DESCRIPTION
    "These objects are used to monitor/manage OSPF
    virtual interfaces."
 ::= { ospfGroups 20 }

ospfNbrGroup2    OBJECT-GROUP
OBJECTS {
    ospfNbrIpAddress,
    ospfNbrAddressLessIndex,
    ospfNbrRtrId,
    ospfNbrOptions,
    ospfNbrPriority,
    ospfNbrState,
    ospfNbrEvents,
    ospfNbrLsRetransQLen,
    ospfNbmaNbrStatus,
    ospfNbmaNbrPermanence,
    ospfNbrHelloSuppressed,
    ospfNbrRestartHelperStatus,
    ospfNbrRestartHelperAge,
    ospfNbrRestartHelperExitReason
}
STATUS          current
DESCRIPTION
    "These objects are used to monitor/manage OSPF

```

```

        neighbors."
 ::= { ospfGroups 21 }

ospfVirtNbrGroup2    OBJECT-GROUP
OBJECTS {
    ospfVirtNbrArea,
    ospfVirtNbrRtrId,
    ospfVirtNbrIpAddress,
    ospfVirtNbrOptions,
    ospfVirtNbrState,
    ospfVirtNbrEvents,
    ospfVirtNbrLsRetransQLen,
    ospfVirtNbrHelloSuppressed,

```

```

        ospfVirtNbrRestartHelperStatus,
        ospfVirtNbrRestartHelperAge,
        ospfVirtNbrRestartHelperExitReason
    }
    STATUS          current
    DESCRIPTION
        "These objects are used to monitor/manage OSPF
        virtual neighbors."
    ::= { ospfGroups 22 }

ospfAreaAggregateGroup2    OBJECT-GROUP
    OBJECTS {
        ospfAreaAggregateAreaID,
        ospfAreaAggregateLsdbType,
        ospfAreaAggregateNet,
        ospfAreaAggregateMask,
        ospfAreaAggregateStatus,
        ospfAreaAggregateEffect,
        ospfAreaAggregateExtRouteTag
    }
    STATUS          current
    DESCRIPTION
        "These objects are used for OSPF systems to support
        network prefix aggregation across areas."
    ::= { ospfGroups 23 }

ospfAreaLsaCountGroup      OBJECT-GROUP
    OBJECTS {
        ospfAreaLsaCountNumber
    }
    STATUS          current
    DESCRIPTION
        "This objects are used for OSPF systems that display
        per area, per LSA-type counters."
    ::= { ospfGroups 24 }

ospfHostGroup2            OBJECT-GROUP
    OBJECTS {
        ospfHostIpAddress,
        ospfHostTOS,

```

```

        ospfHostMetric,
        ospfHostStatus,
        ospfHostCfgAreaID

```

```

    }
    STATUS          current
    DESCRIPTION
        "These objects are used for OSPF systems
        that support attached hosts."
    ::= { ospfGroups 25 }

--      This object group is included for SMI conformance. It is not a
--      mandatory group for compliance with this MIB

ospfObsoleteGroup    OBJECT-GROUP
    OBJECTS {
        ospfAuthType
    }
    STATUS          obsolete
    DESCRIPTION
        "These objects are obsolete and are no longer required for
        OSPF systems. They are placed into this group for SMI
        conformance"
    ::= { ospfGroups 26 }

END

```

[4. OSPF Trap Overview](#)

[4.1 Introduction](#)

OSPF is an event driven routing protocol, where an event can be a change in an OSPF interface's link-level status, the expiration of an OSPF timer or the reception of an OSPF protocol packet. Many of the actions that OSPF takes as a result of these events will result in a change of the routing topology.

As routing topologies become large and complex it is often difficult to locate the source of a topology change or unpredicted routing path by polling a large number of routers. Because of the difficulty of polling a large number of devices, a more prudent approach is for devices to notify a network manager of potentially critical OSPF events using SNMP traps.

This section defines a set of traps, objects and mechanisms to enhance the ability to manage IP internetworks which use OSPF as its IGP. It is an optional but very useful extension to the OSPF MIB.

[4.2 Approach](#)

The mechanism for sending traps is straight-forward. When an exception event occurs, the application notifies the local agent who sends a trap to the appropriate SNMP management stations. The

OSPFv2 MIB

May 2006

message includes the trap type and may include a list of trap specific variables. [Section 5](#) gives the trap definitions which includes the variable lists. The router ID of the originator of the trap is included in the variable list so that the network manager may easily determine the source of the trap.

To limit the frequency of OSPF traps, the following additional mechanisms are suggested.

[4.3](#) Ignoring Initial Activity

The majority of critical events occur when OSPF is enabled on a router, at which time the designated router is elected and neighbor adjacencies are formed. During this initial period a potential flood of traps is unnecessary since the events are expected. To avoid unnecessary traps, a router should not originate expected OSPF interface related traps until two of that interface's dead timer intervals have elapsed. The expected OSPF interface traps are `ospfIfStateChange`, `ospfVirtIfStateChange`, `ospfNbrStateChange`, `ospfVirtNbrStateChange`, `ospfTxRetranmit` and `ospfVirtIfTxRetransmit`. Additionally, `ospfMaxAgeLsa` and `ospfOriginateLsa` traps should not be originated until two dead timer intervals have elapsed where the dead timer interval used should be the dead timer with the smallest value.

[4.4](#) Throttling Traps

The mechanism for throttling the traps is similar to the mechanism explained in [RFC 1224](#) [[RFC1224](#)]. The basic premise of the throttling mechanism is that of a sliding window, defined in seconds and an upper bound on the number of traps that may be generated within this window. Note that unlike [RFC 1224](#), traps are not sent to inform the network manager that the throttling mechanism has kicked in.

A single window should be used to throttle all OSPF traps types except for the `ospfLsdbOverflow` and the `ospfLsdbApproachingOverflow` trap which should not be throttled. For example, with a window time of 3, an upper bound of 3, and events to cause trap types 1,3,5 and 7 (4 traps within a 3 second period), the type 7 (the 4th) trap should not be generated.

Appropriate values are 7 traps with a window time of 10 seconds.

4.5 One Trap Per OSPF Event

Several of the traps defined in [section 5](#) are generated as the result of finding an unusual condition while parsing an OSPF packet or a processing a timer event. There may be more than one unusual condition detected while handling the event. For example, a link-state update packet may contain several retransmitted link-state advertisements (LSAs), or a retransmitted database description packet may contain several

database description entries. To limit the number of traps and variables, OSPF should generate at most one trap per OSPF event. Only the variables associated with the first unusual condition should be included with the trap. Similarly, if more than one type of unusual condition is encountered while parsing the packet, only the first event will generate a trap.

4.6 Polling Event Counters

Many of the tables in the OSPF MIB contain generalized event counters. By enabling the traps defined in this document a network manager can obtain more specific information about these events. A network manager may want to poll these event counters and enable specific OSPF traps when a particular counter starts increasing abnormally.

The following table shows the relationship between the event counters defined in the OSPF MIB and the trap types.

Counter32	Trap Type
-----	-----
ospfOriginateNewLsas	ospfOriginateLsa
ospfIfEvents	ospfIfStateChange
	ospfConfigError
	ospfIfAuthFailure
	ospfRxBadPacket
	ospfTxRetransmit
ospfVirtIfEvents	ospfVirtIfStateChange
	ospfVirtIfConfigError
	ospfVirtIfAuthFailure
	ospfVirtIfRxBadPacket
	ospfVirtIfTxRetransmit
ospfNbrEvents	ospfNbrStateChange

ospfVirtNbrEvents
ospfExternLSACount
ospfExternLSACount

ospfVirtNbrStateChange
ospfLsdbApproachingOverflow
ospfLsdbOverflow

[4.7](#) Translating Notification Parameters

The definition of the OSPF notifications pre-dates the [RFC 2578](#) [[RFC2578](#)] requirement of having a zero value for the penultimate sub-identifier for translating SNMPv2/SNMPv3 trap parameters to SNMPv1 trap parameters. [RFC 3584](#) [[RFC3584](#)], [section 3](#), defines the translation rules which can be implemented by intermediate proxy-agents or multi-lingual agents to convert SNMPv2/SNMPv3 notifications to SNMPv1 notifications and vice versa. The conversion is not reversible, that is, a conversion to one SNMP version and then back again will result in an incorrectly formatted version of the notification.

According to the rules specified in [RFC 3584, section 3.1](#), translation of OSPF notifications from SNMPv1 to SNMPv2/SNMPv3

Internet Draft

Expires November 2006

[Page 88]

OSPFv2 MIB

May 2006

would result in the SNMPv2/SNMPv3 snmpTrapOID being the concatenation of the SNMPv1 'enterprise' parameter and two additional sub-identifiers, '0' and the SNMPv1 'specific-trap' parameter.

According to the rules specified in [RFC 3584, section 3.2](#), translation of OSPF notifications from SNMPv2/SNMPv3 to SNMPv1, as the notifications are defined in this MIB, would result in the SNMPv1 'enterprise' parameter being set to the SNMPv2/SNMPv3 snmpTrapOID parameter value with the last sub-identifier removed and the 'specific-trap' parameter being set to the last sub-identifier of the SNMPv2/SNMPv3 snmpTrapOID parameter.

Note that a notification originated from an SNMPv1 agent will not be converted into the same notification that would be originated from a native SNMPv2/SNMPv3 agent.

[4.8](#) Historical Artifacts

The MIB modules that are updated by this document were originally written in SMIV1 for SNMPv1 when only traps were used. Since this

version of the MIB module is written in SMIV2, it should be understood that all types of notifications, trap and inform PDUs, may be used by native SNMPv2 and SNMPv3 agents, although only traps are mentioned. Also, for backwards compatibility, the OSPF Trap module remains rooted at {ospf 16}.

5. OSPF Trap Definitions

OSPF-TRAP-MIB DEFINITIONS ::= BEGIN

IMPORTS

```
MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE, IPAddress
    FROM SNMPv2-SMI
MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
    FROM SNMPv2-CONF
ospfRouterId, ospfIfIpAddress, ospfAddressLessIf, ospfIfState,
ospfVirtIfAreaId, ospfVirtIfNeighbor, ospfVirtIfState,
ospfNbrIpAddr, ospfNbrAddressLessIndex, ospfNbrRtrId,
ospfNbrState, ospfVirtNbrArea, ospfVirtNbrRtrId,
ospfVirtNbrState, ospfLsdbType, ospfLsdbLsid, ospfLsdbRouterId,
ospfLsdbAreaId, ospfExtLsdbLimit, ospf, ospfAreaId,
ospfAreaNssaTranslatorState, ospfRestartStatus,
ospfRestartInterval, ospfRestartExitReason,
ospfNbrRestartHelperStatus, ospfNbrRestartHelperAge,
ospfNbrRestartHelperExitReason, ospfVirtNbrRestartHelperStatus,
ospfVirtNbrRestartHelperAge, ospfVirtNbrRestartHelperExitReason
    FROM OSPF-MIB;
```

ospfTrap MODULE-IDENTITY

Internet Draft

Expires November 2006

[Page 89]

OSPFv2 MIB

May 2006

LAST-UPDATED "200605240900Z" -- May 24, 2006 09:00:00 EST
ORGANIZATION "IETF OSPF Working Group"
CONTACT-INFO
"WG E-Mail: ospf@ietf.org"

WG Chairs: acee@cisco.com
 rohit@gmail.com

Editors: Dan Joyal
 Nortel
 600 Technology Park Drive
 Billerica, MA 01821
 djoyal@nortel.com

Piotr Galecki
Airvana
19 Alpha Road
Chelmsford, MA 01824
pgalecki@airvana.com

Spencer Giacalone
Credit Suisse First Boston
Eleven Madison Ave
New York, NY 10010-3629
spencer.giacalone@csfb.com"

DESCRIPTION

"The MIB module to describe traps for the OSPF
Version 2 Protocol.

Copyright (C) The Internet Society (2006).
This version of this MIB module is part of
RFC XXXX; see the RFC itself for full legal
notices."

-- RFC Editor: please fill in XXXX and remove this note

REVISION "200605240900Z" -- May 24, 2006 09:00:00 EST

DESCRIPTION

"Updated for latest changes to OSPFv2:
-added graceful restart related traps
-added new config error types
-added ospfNssaTranslatorStatusChange trap.
See [section 12](#) of RFC XXXX for more details.

This version published as part of RFC XXXX"

-- RFC Editor: please fill in XXXX and remove this note

REVISION "199501201225Z" -- Fri Jan 20 12:25:50 PST 1995

DESCRIPTION

"The initial SMIV2 revision of this MIB module, published
in [RFC1850](#)."

Internet Draft

Expires November 2006

[Page 90]

OSPFv2 MIB

May 2006

::= { ospf 16 }

-- Trap Support Objects

-- The following are support objects for the OSPF traps.

ospfTrapControl OBJECT IDENTIFIER ::= { ospfTrap 1 }

ospfTraps OBJECT IDENTIFIER ::= { ospfTrap 2 }

ospfSetTrap OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(4))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"A four-octet string serving as a bit map for the trap events defined by the OSPF traps. This object is used to enable and disable specific OSPF traps where a 1 in the bit field represents enabled. The right-most bit (least significant) represents trap 0.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage."

::= { ospfTrapControl 1 }

ospfConfigErrorType OBJECT-TYPE

SYNTAX INTEGER {

badVersion (1),
areaMismatch (2),
unknownNbmaNbr (3), -- Router is DR eligible
unknownVirtualNbr (4),
authTypeMismatch(5),
authFailure (6),
netMaskMismatch (7),
helloIntervalMismatch (8),
deadIntervalMismatch (9),
optionMismatch (10),
mtuMismatch (11),
duplicateRouterId (12),
noError (13) }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Potential types of configuration conflicts. Used by the ospfConfigError and ospfConfigVirtError traps. When the last value of a trap using this object is needed, but no traps of that type have been sent, this value pertaining to this object should be returned as noError"

::= { ospfTrapControl 2 }

OSPFv2 MIB

May 2006

ospfPacketType OBJECT-TYPE

```
SYNTAX      INTEGER {
                hello (1),
                dbDescript (2),
                lsReq (3),
                lsUpdate (4),
                lsAck (5),
                nullPacket (6) }
```

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

```
STATUS      current
```

DESCRIPTION

"OSPF packet types. When the last value of a trap using this object is needed, but no traps of that type have been sent, this value pertaining to this object should be returned as nullPacket"

```
::= { ospfTrapControl 3 }
```

ospfPacketSrc OBJECT-TYPE

```
SYNTAX      IPAddress
```

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

```
STATUS      current
```

DESCRIPTION

"The IP address of an inbound packet that cannot be identified by a neighbor instance. When the last value of a trap using this object is needed, but no traps of that type have been sent, this value pertaining to this object should be returned as 0.0.0.0"

```
::= { ospfTrapControl 4 }
```

-- Traps

ospfVirtIfStateChange NOTIFICATION-TYPE

```
OBJECTS { ospfRouterId, -- The originator of the trap
            ospfVirtIfAreaId,
            ospfVirtIfNeighbor,
            ospfVirtIfState -- The new state
          }
```

```
STATUS      current
```

DESCRIPTION

"An ospfVirtIfStateChange trap signifies that there has been a change in the state of an OSPF virtual interface."

This trap should be generated when the interface state regresses (e.g., goes from Point-to-Point to Down) or progresses to a terminal state (i.e., Point-to-Point)."
 ::= { ospfTraps 1 }

ospfNbrStateChange NOTIFICATION-TYPE
OBJECTS { ospfRouterId, -- The originator of the trap
ospfNbrIpAddress,
ospfNbrAddressLessIndex,

Internet Draft

Expires November 2006

[Page 92]

OSPFv2 MIB

May 2006

ospfNbrRtrId,
ospfNbrState -- The new state
}

STATUS current

DESCRIPTION

"An ospfNbrStateChange trap signifies that there has been a change in the state of a non-virtual OSPF neighbor. This trap should be generated when the neighbor state regresses (e.g., goes from Attempt or Full to 1-Way or Down) or progresses to a terminal state (e.g., 2-Way or Full). When an neighbor transitions from or to Full on non-broadcast multi-access and broadcast networks, the trap should be generated by the designated router. A designated router transitioning to Down will be noted by ospfIfStateChange."

::= { ospfTraps 2 }

ospfVirtNbrStateChange NOTIFICATION-TYPE
OBJECTS { ospfRouterId, -- The originator of the trap
ospfVirtNbrArea,
ospfVirtNbrRtrId,
ospfVirtNbrState -- The new state
}

STATUS current

DESCRIPTION

"An ospfVirtNbrStateChange trap signifies that there has been a change in the state of an OSPF virtual neighbor. This trap should be generated when the neighbor state regresses (e.g., goes from Attempt or Full to 1-Way or Down) or progresses to a terminal state (e.g., Full)."

```
::= { ospfTraps 3 }
```

ospfIfConfigError NOTIFICATION-TYPE

```
OBJECTS { ospfRouterId, -- The originator of the trap
  ospfIfIpAddress,
  ospfAddressLessIf,
  ospfPacketSrc, -- The source IP address
  ospfConfigErrorType, -- Type of error
  ospfPacketType
}
```

```
STATUS      current
```

DESCRIPTION

"An ospfIfConfigError trap signifies that a packet has been received on a non-virtual interface from a router whose configuration parameters conflict with this router's configuration parameters. Note that the event optionMismatch should cause a trap only if it prevents an adjacency from forming."

```
::= { ospfTraps 4 }
```

ospfVirtIfConfigError NOTIFICATION-TYPE

```
OBJECTS { ospfRouterId, -- The originator of the trap
  ospfVirtIfAreaId,
  ospfVirtIfNeighbor,
  ospfConfigErrorType, -- Type of error
  ospfPacketType
}
```

```
STATUS      current
```

DESCRIPTION

"An ospfVirtIfConfigError trap signifies that a packet has been received on a virtual interface from a router whose configuration parameters conflict with this router's configuration parameters. Note that the event optionMismatch should cause a trap only if it prevents an adjacency from forming."

```
::= { ospfTraps 5 }
```

ospfIfAuthFailure NOTIFICATION-TYPE

```
OBJECTS { ospfRouterId, -- The originator of the trap
  ospfIfIpAddress,
  ospfAddressLessIf,
```



```

        ospfPacketSrc, -- The source IP address
        ospfConfigErrorType, -- authTypeMismatch or
                                -- authFailure
        ospfPacketType
    }
STATUS      current
DESCRIPTION
    "An ospfIfAuthFailure trap signifies that a
    packet has been received on a non-virtual
    interface from a router whose authentication key
    or authentication type conflicts with this
    router's authentication key or authentication
    type."
::= { ospfTraps 6 }

```

ospfVirtIfAuthFailure NOTIFICATION-TYPE

```

OBJECTS { ospfRouterId, -- The originator of the trap
        ospfVirtIfAreaId,
        ospfVirtIfNeighbor,
        ospfConfigErrorType, -- authTypeMismatch or
                                -- authFailure
        ospfPacketType
    }
STATUS      current
DESCRIPTION
    "An ospfVirtIfAuthFailure trap signifies that a
    packet has been received on a virtual interface
    from a router whose authentication key or
    authentication type conflicts with this router's
    authentication key or authentication type."

```

```

::= { ospfTraps 7 }

```

ospfIfRxBadPacket NOTIFICATION-TYPE

```

OBJECTS { ospfRouterId, -- The originator of the trap
        ospfIfIpAddress,
        ospfAddressLessIf,
        ospfPacketSrc, -- The source IP address
        ospfPacketType
    }
STATUS      current
DESCRIPTION
    "An ospfIfRxBadPacket trap signifies that an
    OSPF packet has been received on a non-virtual

```

```

        interface that cannot be parsed."
 ::= { ospfTraps 8 }

ospfVirtIfRxBadPacket NOTIFICATION-TYPE
OBJECTS { ospfRouterId, -- The originator of the trap
  ospfVirtIfAreaId,
  ospfVirtIfNeighbor,
  ospfPacketType
}
STATUS      current
DESCRIPTION
  "An ospfVirtIfRxBadPacket trap signifies that an OSPF
  packet has been received on a virtual interface
  that cannot be parsed."
 ::= { ospfTraps 9 }

ospfTxRetransmit NOTIFICATION-TYPE
OBJECTS { ospfRouterId, -- The originator of the trap
  ospfIfIpAddress,
  ospfAddressLessIf,
  ospfNbrRtrId, -- Destination
  ospfPacketType,
  ospfLsdbType,
  ospfLsdbLsid,
  ospfLsdbRouterId
}
STATUS      current
DESCRIPTION
  "An ospfTxRetransmit trap signifies than an
  OSPF packet has been retransmitted on a
  non-virtual interface. All packets that may be
  retransmitted are associated with an LSDB entry.
  The LS type, LS ID, and Router ID are used to
  identify the LSDB entry."
 ::= { ospfTraps 10 }

ospfVirtIfTxRetransmit NOTIFICATION-TYPE
OBJECTS { ospfRouterId, -- The originator of the trap
  ospfVirtIfAreaId,
  ospfVirtIfNeighbor,

```

```

  ospfPacketType,
  ospfLsdbType,
  ospfLsdbLsid,

```

```

        ospfLsdbRouterId
    }
STATUS          current
DESCRIPTION
    "An ospfVirtIfTxRetransmit trap signifies than an
    OSPF packet has been retransmitted on a virtual
    interface. All packets that may be retransmitted
    are associated with an LSDB entry. The LS
    type, LS ID, and Router ID are used to identify
    the LSDB entry."
::= { ospfTraps 11 }

```

ospfOriginateLsa NOTIFICATION-TYPE

```

OBJECTS { ospfRouterId, -- The originator of the trap
    ospfLsdbAreaId, -- 0.0.0.0 for AS Externals
    ospfLsdbType,
    ospfLsdbLsid,
    ospfLsdbRouterId
}
STATUS          current
DESCRIPTION
    "An ospfOriginateLsa trap signifies that a new
    LSA has been originated by this router. This
    trap should not be invoked for simple refreshes
    of LSAs (which happens every 30 minutes), but
    instead will only be invoked when an LSA is
    (re)originated due to a topology change.
    Additionally, this trap does not include LSAs that
    are being flushed because they have reached
    MaxAge."
::= { ospfTraps 12 }

```

ospfMaxAgeLsa NOTIFICATION-TYPE

```

OBJECTS { ospfRouterId, -- The originator of the trap
    ospfLsdbAreaId, -- 0.0.0.0 for AS Externals
    ospfLsdbType,
    ospfLsdbLsid,
    ospfLsdbRouterId
}
STATUS          current
DESCRIPTION
    "An ospfMaxAgeLsa trap signifies that one of
    the LSA in the router's link-state database has
    aged to MaxAge."
::= { ospfTraps 13 }

```

ospfLsdbOverflow NOTIFICATION-TYPE

```

OBJECTS { ospfRouterId, -- The originator of the trap
    ospfExtLsdbLimit
}

```

OSPFv2 MIB

May 2006

STATUS current

DESCRIPTION

"An ospfLsdbOverflow trap signifies that the number of LSAs in the router's link-state database has exceeded ospfExtLsdbLimit."

::= { ospfTraps 14 }

ospfLsdbApproachingOverflow NOTIFICATION-TYPE

OBJECTS { ospfRouterId, -- The originator of the trap
ospfExtLsdbLimit
}

STATUS current

DESCRIPTION

"An ospfLsdbApproachingOverflow trap signifies that the number of LSAs in the router's link-state database has exceeded ninety percent of ospfExtLsdbLimit."

::= { ospfTraps 15 }

ospfIfStateChange NOTIFICATION-TYPE

OBJECTS { ospfRouterId, -- The originator of the trap
ospfIfIpAddress,
ospfAddressLessIf,
ospfIfState -- The new state
}

STATUS current

DESCRIPTION

"An ospfIfStateChange trap signifies that there has been a change in the state of a non-virtual OSPF interface. This trap should be generated when the interface state regresses (e.g., goes from Dr to Down) or progresses to a terminal state (i.e., Point-to-Point, DR Other, Dr, or Backup)."

::= { ospfTraps 16 }

ospfNssaTranslatorStatusChange NOTIFICATION-TYPE

OBJECTS { ospfRouterId, -- The originator of the trap
ospfAreaId,
ospfAreaNssaTranslatorState -- The current translation
-- status
}

STATUS current

DESCRIPTION

"An ospfNssaTranslatorStatusChange trap indicates that there has been a change in the router's ability to translate OSPF type-7 LSAs into OSPF type-5 LSAs. This trap should be generated when the Translator Status transitions from or to any defined status on a per area basis."

::= { ospfTraps 17 }

ospfRestartStatusChange NOTIFICATION-TYPE

OBJECTS { ospfRouterId, -- The originator of the trap

Internet Draft

Expires November 2006

[Page 97]

OSPFv2 MIB

May 2006

ospfRestartStatus,
ospfRestartInterval,
ospfRestartExitReason

}

STATUS current

DESCRIPTION

"An ospfRestartStatusChange trap signifies that there has been a change in the graceful restart state for the router. This trap should be generated when the router restart status changes."

::= { ospfTraps 18 }

ospfNbrRestartHelperStatusChange NOTIFICATION-TYPE

OBJECTS { ospfRouterId, -- The originator of the trap
ospfNbrIpAddress,
ospfNbrAddressLessIndex,
ospfNbrRtrId,
ospfNbrRestartHelperStatus,
ospfNbrRestartHelperAge,
ospfNbrRestartHelperExitReason
}

STATUS current

DESCRIPTION

"An ospfNbrRestartHelperStatusChange trap signifies that there has been a change in the graceful restart helper state for the neighbor. This trap should be generated when the neighbor restart helper status transitions for a neighbor."

::= { ospfTraps 19 }

ospfVirtNbrRestartHelperStatusChange NOTIFICATION-TYPE

OBJECTS { ospfRouterId, -- The originator of the trap

```

        ospfVirtNbrArea,
        ospfVirtNbrRtrId,
        ospfVirtNbrRestartHelperStatus,
        ospfVirtNbrRestartHelperAge,
        ospfVirtNbrRestartHelperExitReason
    }
STATUS      current
DESCRIPTION
    "An ospfVirtNbrRestartHelperStatusChange trap signifies that
    there has been a change in the graceful restart
    helper state for the virtual neighbor. This trap should be
    generated when the virtual neighbor restart helper status
    transitions for a virtual neighbor."
::= { ospfTraps 20 }

```

-- conformance information

```
ospfTrapConformance OBJECT IDENTIFIER ::= { ospfTrap 3 }
```

Internet Draft

Expires November 2006

[Page 98]

OSPFv2 MIB

May 2006

```
ospfTrapGroups      OBJECT IDENTIFIER ::= { ospfTrapConformance 1 }
ospfTrapCompliances OBJECT IDENTIFIER ::= { ospfTrapConformance 2 }

```

-- compliance statements

```
ospfTrapCompliance MODULE-COMPLIANCE
STATUS      obsolete
DESCRIPTION
    "The compliance statement"
MODULE      -- this module
MANDATORY-GROUPS { ospfTrapControlGroup }

GROUP      ospfTrapControlGroup
DESCRIPTION
    "This group is optional but recommended for all
    OSPF systems"
::= { ospfTrapCompliances 1 }

```

```
ospfTrapCompliance2 MODULE-COMPLIANCE
STATUS      current
DESCRIPTION
    "The compliance statement"
MODULE      -- this module

```

```

MANDATORY-GROUPS { ospfTrapControlGroup, ospfTrapEventGroup }
OBJECT      ospfConfigErrorType
MIN-ACCESS  accessible-for-notify
DESCRIPTION
    "This object is only required to be supplied within
    notifications."
OBJECT      ospfPacketType
MIN-ACCESS  accessible-for-notify
DESCRIPTION
    "This object is only required to be supplied within
    notifications."
OBJECT      ospfPacketSrc
MIN-ACCESS  accessible-for-notify
DESCRIPTION
    "This object is only required to be supplied within
    notifications."
::= { ospfTrapCompliances 2 }

```

-- units of conformance

```

ospfTrapControlGroup    OBJECT-GROUP
    OBJECTS { ospfSetTrap,
                ospfConfigErrorType,
                ospfPacketType,
                ospfPacketSrc }
    STATUS      current
    DESCRIPTION
        "These objects are required to control traps
        from OSPF systems."
    ::= { ospfTrapGroups 1 }

```

```

ospfTrapEventGroup      NOTIFICATION-GROUP
    NOTIFICATIONS {
        ospfVirtIfStateChange,
        ospfNbrStateChange,
        ospfVirtNbrStateChange,
        ospfIfConfigError,
        ospfVirtIfConfigError,
        ospfIfAuthFailure,
        ospfVirtIfAuthFailure,
        ospfIfRxBadPacket,
        ospfVirtIfRxBadPacket,
        ospfTxRetransmit,
    }

```

```

        ospfVirtIfTxRetransmit,
        ospfOriginateLsa,
        ospfMaxAgeLsa,
        ospfLsdbOverflow,
        ospfLsdbApproachingOverflow,
        ospfIfStateChange,
        ospfNssaTranslatorStatusChange,
        ospfRestartStatusChange,
        ospfNbrRestartHelperStatusChange,
        ospfVirtNbrRestartHelperStatusChange
    }
STATUS          current
DESCRIPTION
    "A grouping of OSPF Trap Events, as specified
    in NOTIFICATION-TYPE constructs."
 ::= { ospfTrapGroups 2 }

```

END

6. Security Considerations

There are a number of management objects defined in this MIB that have 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.

It is recommended that attention be specifically given to implementing the MAX-ACCESS clause in a number of objects, including ospfIfAuthKey, ospfIfAuthType, ospfVirtIfAuthKey, and ospfVirtIfAuthType in scenarios that DO NOT use SNMPv3 strong security (i.e. authentication and encryption). Extreme caution must be used to minimize the risk of cascading security vulnerabilities when SNMPv3 strong security is not used. When SNMPv3 strong security is not used, these objects should have access of read-only, not read-create.

SNMPv1 by itself is not a secure environment. Even if the network

itself is secure (for example by using IPsec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 3414](#) [[RFC3414](#)] and the View-based Access Control Model [RFC 3415](#) [[RFC3415](#)] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, 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:

Descriptor -----	OBJECT IDENTIFIER value -----
ospf	{ mib-2 14 }

[8.](#) Acknowledgements

This document was produced by the OSPF Working Group, and is based on the MIB for OSPF version 2 by Rob Coltun and Fred Baker [[RFC1850](#)]. The editors would like to acknowledge John Moy, Rob Coltun, Randall Atkinson, David T. Perkins, Ken Chapman, Brian Field, Acee Lindem, Vishwas Manral, Roy Jose, Don Goodspeed, Vivek Dubey, Keith McCloghrie, Bill Fenner and Dan Romascanu for their constructive comments.

[9.](#) References

[9.1](#) Normative References

- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M. and S. Waldbusser, "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M. and S. Waldbusser, "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M. and S. Waldbusser, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.

OSPFv2 MIB

May 2006

[9.2](#) Informative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC1224] Steinberg, L., "Techniques for Managing Asynchronously Generated Alerts", [RFC 1224](#), May 1991.
- [RFC1704] Haller, N., Atkinson, R., "On Internet Authentication", [RFC 1704](#), October, 1994.
- [RFC1765] Moy, J., "OSPF Database Overflow", [RFC 1765](#), March 1995.
- [RFC1793] Moy, J., "Extending OSPF to Support Demand Circuits", [RFC 1793](#), April 1995.
- [RFC1850] Baker, F., and Coltun, R., "OSPF Version 2 Management Information Base", [RFC 1850](#), November 1995.
- [RFC2328] Moy, J., "OSPF Version 2", [RFC 2328](#), April 1998.
- [RFC2370] Coltun, R., "The OSPF Opaque LSA Option", [RFC 2370](#), July 1998.
- [RFC3101] Murphy, P., "The OSPF Not-So-Stubby Area (NSSA) Option", [RFC 3101](#), January 2003.
- [RFC3410] Case, J., Mundy, R., Partain, D. and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.
- [RFC3414] Blumenthal, U., Wijnen, B., "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", [RFC 3414](#), December 2002.
- [RFC3415] Wijnen, B., Presuhn, R., McCloghrie, K., "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", [RFC 3415](#), December 2002.

[RFC3584] Frye, R., Levi, D., Routhier, S., Wijnen, B.,
"Coexistence between Version 1, Version 2, and
Version 3 of the Internet-standard Network
Management Framework", [RFC 3584](#), August 2003.

[RFC3623] Moy, J., Pillay-Esnault, P., Lindem, A.,
"Graceful OSPF Restart", [RFC 3623](#), November 2003.

[10.](#) Intellectual Property

Internet Draft

Expires November 2006

[Page 102]

OSPFv2 MIB

May 2006

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in [BCP 78](#) and [BCP 79](#).

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at <http://www.ietf.org/ipr>.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

[11.](#) TOS Support

For backward compatibility with previous versions of the OSPF MIB specification, TOS-specific information has been retained in this document, though the TOS routing option has been deleted from OSPF [[RFC2328](#)].

[12.](#) Changes from [RFC 1850](#)

This section documents the differences between this memo and [RFC 1850](#).

[12.1](#) General Group Changes

Added object ospfRFC1583Compatibility to indicate support with "[RFC 1583](#) Compatibility" This object has DEFVAL of "enabled".

Added object ospfReferenceBandwidth to allow configuration of a reference bandwidth for calculation of default interface metrics.

Added objects ospfRestartSupport, ospfRestartInterval, ospfRestartAge ospfRestartStrictLsaChecking and ospfRestartExitReason to support graceful restart.

Added objects ospfStubRouterSupport and ospfStubRouteAdvertisement to support stub routers.

Internet Draft

Expires November 2006

[Page 103]

OSPFv2 MIB

May 2006

Added object ospfDiscontinuityTime in order for a management entity to detect counter discontinuity events.

[12.2](#) OSPF NSSA Enhancement Support

Added new objects to OspfAreaTable including:

- ospfAreaNssaTranslatorRole to indicate the configured NSSA translation role.
- ospfAreaNssaTranslatorState to indicate the current NSSA translation role.
- ospfAreaNssaTranslatorStabilityInterval to indicate time to continue to perform at current translation status.
- ospfAreaNssaTranslatorEvents to indicate the number of times OSPF Translation State has changed.

Added new object ospfAreaAggregateExtRouteTag to ospfAreaAggregateTable.

Added new object ospfNssaTranslatorStatusChange to ospfTraps in OSPF-TRAP-MIB DEFINITIONS.

Added ospfAreaId to IMPORTS in OSPF-TRAP-MIB DEFINITIONS to support ospfNssaTranslatorStatusChange.

Added ospfAreaExtNssaTranslatorStatus to IMPORTS in OSPF-TRAP-MIB DEFINITIONS to support ospfNssaTranslatorStatusChange.

Modified the DESCRIPTION clause of the ospfAreaSummary object in the ospfAreaTable to indicate support for NSSA.

Modified the DESCRIPTION clause of the ospfImportAsExtern object in the ospfAreaTable for clarity.

[12.3](#) Opaque LSA Support

Added object ospfOpaqueLsaSupport to ospfGeneralGroup to indicate support of OSPF Opaque LSAs.

Created ospfLocalLsdbTable, for Link-local (type-9) LSA support. This table is indexed by:

- ospfLocalLsdbIpAddress
- ospfLocalLsdbAddressLessIf
- ospfLocalLsdbType

- ospfLocalLsdbLsid
- ospfLocalLsdbRouterId

ospfLocalLsdbTable contains the following (columnar) objects:

- ospfLocalLsdbSequence, to indicate LSA instance
- ospfLocalLsdbAge
- ospfLocalLsdbChecksum

- ospfLocalLsdbAdvertisement, containing the entire LSA

Created ospfVirLocalLsdbTable, for Link-local (type-9) LSA support on virtual links. This table is indexed by:

- ospfVirtLocalLsdbTransitArea

- ospfVirtLocalLsdbNeighbor, to indicate the router ID of the virtual neighbor

- ospfVirLocalLsdbType

- ospfVirLocalLsdbLsid

- ospfVirLocalLsdbRouterId

ospfVirLocalLsdbTable contains the following (columnar) objects:

- ospfVirLocalLsdbSequence, to indicate LSA instance

- ospfVirLocalLsdbAge

- ospfVirLocalLsdbChecksum

- ospfVirLocalLsdbAdvertisement, containing the entire LSA

Added objects to ospfIfTable to support Link-local (type-9) LSAs, including:

- ospfIfLsaCount

- ospfIfLsaChecksumSum, to indicate the sum of the type-9 link-state advertisement checksums on this interface

Added objects to ospfVirIfTable, to support Link-local (type-9) LSAs on virtual links, including:

- ospfVirIfLsaCount

- ospfVirIfLsaChecksumSum, to indicate the sum of the type-9

link-state advertisement checksums on this link.

To support area scope (type-10) LSAs, the enumeration

areaOpaqueLink (10) was added to ospfLsdbType in the ospfLsdbTable.

Created ospfAsLsdbTable, for AS-scope LSA support. This table is indexed by:

- ospfAsLsdbType
- ospfAsLsdbLsid
- ospfAsLsdbRouterId

ospfAsLsdbTable contains the following (columnar) objects:

- ospfAsLsdbSequence, to indicate LSA instance
- ospfAsLsdbAge
- ospfAsLsdbChecksum
- ospfAsLsdbAdvertisement, containing the entire LSA

[12.4](#) Graceful Restart Support

Added objects ospfRestartSupport, ospfRestartInterval, ospfRestartAge ospfRestartStrictLsaChecking and ospfRestartExitReason to general group.

Added objects ospfNbrRestartHelperStatus, ospfNbrRestartHelperAge and ospfNbrRestartHelperExitReason to OspfNbrTable.

Added objects ospfVirtNbrRestartHelperStatus, ospfVirtNbrRestartHelperAge and ospfVirtNbrRestartHelperExitReason to OspfVirtNbrTable.

[12.5](#) OSPF Compliances

New compliance statements were added for new and for obsoleted conformance groups. These Statements include:

- ospfCompliance2
- ospfComplianceObsolete

New conformance groups were created to support new objects added to the group. These groups include:

- ospfBasicGroup2

OSPFv2 MIB

May 2006

- ospfAreaGroup2
- ospfIfGroup2
- ospfVirtIfGroup2
- ospfNbrGroup2
- ospfVirtNbrGroup2
- ospfAreaAggregateGroup2

Added completely new conformance groups, including:

- ospfLocalLsdbGroup, which specifies support for link local (type-9) LSAs.
- ospfVirtLocalLsdbGroup, which specifies support for link local (type-9) LSAs on virtual links.
- ospfObsoleteGroup, for obsolete objects and SMI compatibility.

[12.6](#) OSPF Authentication and Security

As there has been significant concern in the community regarding cascading security vulnerabilities, the following changes have been incorporated:

- Modified the DESCRIPTION clause of ospfIfAuthKey due to security concerns, and to increase clarity
- Modified the DESCRIPTION clause of ospfVirtIfAuthKey due to security concerns, and to increase clarity
- Modified the DESCRIPTION clause of ospfIfAuthType due to security concerns, and to increase clarity
- Modified the DESCRIPTION clause of ospfVirtIfType due to security concerns, and to increase clarity

- Modified the OSPF MIB MODULE DESCRIPTION due to security concerns and to include a reference to the security considerations section in this document that will transcend compilation
- Modified the security considerations section to provide detail

[12.7](#) OSPF Trap MIB

Internet Draft

Expires November 2006

[Page 107]

OSPFv2 MIB

May 2006

Added ospfTrapEventGroup.

Added importation of NOTIFICATION-GROUP.

Changed the STATUS of the ospfTrapCompliance MODULE-COMPLIANCE construct to obsolete.

Added ospfTrapCompliance2 MODULE-COMPLIANCE construct which replaces ospfTrapCompliance. OspfTrapCompliance includes an updated MANDATORY-GROUPS clause and new MIN-ACCESS specifications.

Added mtuMismatch enumeration to ospfConfigErrorType object in ospfTrapControl to imply MTU mismatch trap generation. in ospfIfConfigError.

Added noError enumeration to ospfConfigErrorType object for situations when traps are requested, but none have been sent. Updated the DESCRIPTION clause accordingly.

Added nullPacket enumeration to ospfPacketType object for situations when traps are requested, but none have been sent. Updated the DESCRIPTION clause accordingly.

Updated the DESCRIPTION clause of ospfPacketSrc for situations when traps are requested, but none have been sent.

Added NOTIFICATION-TYPE for ospfRestartStatusChange.

Added NOTIFICATION-TYPE for ospfNbrRestartHelperStatusChange.

Added NOTIFICATION-TYPE for ospfVirtNbrRestartHelperStatusChange.

[12.8](#) Miscellaneous

Various sections, have been moved and or modified for clarity. Most of these changes are semantic in nature, and include, but are not limited to:

- The OSPF Overview section's format was revised. Unneeded information was removed. Removed information includes OSPF TOS default values.
- The Trap Overview section's format and working were revised. Unneeded information was removed.
- Modified the DESCRIPTION clause of "Status" "TEXTUAL-CONVENTION" for clarity
- The updates section was moved from the Overview to its own section

Internet Draft

Expires November 2006

[Page 108]

OSPFv2 MIB

May 2006

- Updated "REFERENCE" clauses in all objects, as needed
- Modified the SEQUENCE of the OspfIfTable to reflect the true order of the objects in the Table
- Modified the DESCRIPTION clause of all row management objects for clarity

Added ospfHostCfgAreaID to object to Host table with read-create access. Deprecated ospfHostAreaID.

Added importation of InterfaceIndexOrZero from IF-MIB. This TEXTUAL-CONVENTION will replace the InterfaceIndex TEXTUAL-CONVENTION.

Changed the SYNTAX clause of ospfNbrAddressLessIndex to use the semantically identical InterfaceIndexOrZero TEXTUAL-CONVENTION, as permitted by the SMI.

Changed the STATUS clause of the TEXTUAL-CONVENTION InterfaceIndex to obsolete and modified the DESCRIPTION accordingly.

Changed the SYNTAX clause of ospfAddressLessIf to use the semantically identical InterfaceIndexOrZero TEXTUAL-CONVENTION, as permitted by the SMI.

Changed the SYNTAX clause of ospfIfMetricAddressLessIf to use the semantically identical InterfaceIndexOrZero TEXTUAL-CONVENTION, as permitted by the SMI.

Changed importation of mib-2 from [RFC1213](#)-MIB to SNMPv2-SMI

Added Intellectual Property Rights section.

Updated REVISION DESCRIPTION clauses with description of major MIB modifications.

Moved all relevant MIB comments to objects' DESCRIPTION clauses.

Added reasoning for object deprecation.

Added persistence information for read-write, read-create objects.

Described conditions when columns can be modified in RowStatus managed rows as required by [RFC 2579](#).

Defined OspfAuthenticationType TC and modified authentication type objects to use the new type.

Made index objects of new tables not-accessible.

Added the UNITS clause to several objects.

Added ospfIfDesignatedRouterId and ospfIfBackupDesignatedRouterId to the OspfIfEntry.

Added the area LSA counter table.

Added IANA Considerations section.

[13](#). Authors' Addresses

Dan Joyal (editor)
Nortel, Inc.

600 Technology Park Drive
Billerica, MA 01821
USA
EMail: djoyal@nortel.com

Piotr Galecki (editor)
Airvana, Inc.
19 Alpha Road
Chelmsford, MA 01824
USA
EMail: pgalecki@airvana.com

Spencer Giacalone (editor)
Credit Suisse First Boston
Eleven Madison Ave
New York, NY 10010-3629
USA
EMail: spencer.giacalone@csfb.com

Fred Baker
Cisco Systems
1121 Via Del Rey
Santa Barbara, California 93117
USA
EMail: fred@cisco.com

Rob Coltun
Touch Acoustra
3204 Brooklawn Terrace
Chevy Chase, MD 20815
USA
Email: undisclosed

14. Full Copyright Statement

Copyright (C) The Internet Society (2006).

This document is subject to the rights, licenses and restrictions contained in [BCP 78](#), and except as set forth therein, the authors

Internet Draft

Expires November 2006

[Page 110]

OSPFv2 MIB

May 2006

retain all their rights.

This document and the information contained herein are provided on an

"AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

