OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

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This document describes the configuration command that allows you to use either the current interface number or the SNMP MIB-II interface index (ifIndex) value for the interface ID in OSPFv2 and OSPFv3 data fields. The advantage to using the SNMP MIB-II ifIndex value is that this number corresponds to the number that the user will see reported by SNMP.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields" section on page 14.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

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Prerequisites for Using the SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

OSPF must be configured on the router.

Information About the OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

Before choosing to switch from the current interface numbers to the SNMP MIB-II interface ID numbers, you should understand the following concepts:

Benefits of Choosing to Identify Interfaces by the SNMP MIB-II ifIndex Value

If you use Simple Network Management Protocol (SNMP) for your OSPF network, configuring the OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields feature can be beneficial for the following reasons:

- Using the SNMP MIB-II ifIndex (interface index) identification numbers to identify OSPF interfaces makes it easier for network administrators to identify interfaces because the numbers will correspond to the numbers that they will see reported by SNMP.
- When examining link-state advertisements (LSAs), the value used in fields that have the interface ID will be the same as the value that is reported by SNMP.
- When looking at the output of the **show ipv6 ospf interface** command, the interface ID number will have the same value that is reported by SNMP.
- Using the SNMP MIB-II IfIndex is also suggested, but not required, by the OSPF RFC 2328 for OSPFv2 and the RFC 2740 for OSPFv3.

How OSPFv2 and OSPFv3 Use the SNMP MIB-II ifIndex Value

The user chooses for OSPF interfaces to use the SNMP MIB-II ifIndex number by entering the **interface-id snmp-if-index** command for a specific OSPF process. If an interface under the specific OSPF process does not have an SNMP ifIndex number, OSPF will not be enabled on that interface.

For OSPFv2, the ifIndex number is used for the Link Data field in the Router LSA for unnumbered point-to-point interfaces and sham links. When the **interface-id snmp-if-index** command is entered, the affected LSAs will immediately be reoriginated.

For OSPFv3, the ifIndex number is used for the interface ID in router LSAs, as the LSID in Network and Link LSAs, and also as the interface ID in Hello packets. Intra-Area-Prefix LSAs that reference Network LSAs have the network LSAs LSID in the Referenced LSID field, so they will also be updated when the **interface-id snmp-if-index** command is entered. The old Network, Link and Intra-Area-Prefix LSAs that are associated with a Network LSA will be flushed.

For both OSPFv2 and OSPFv3, adjacencies are not flapped, except for affected OSPFv3 demand circuits (including virtual links) with full adjacencies.

For both OSPFv2 and OSPFv3, if an interface does not have an SNMP ifIndex number and an interface ID is needed (for OSPFv2 this applies only to unnumbered interfaces and sham links), an error message will be generated and the interface will be disabled. The interface will be reenabled if the **no interface-id snmp-if-index** command is entered.

How to Configure the SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

This section contains the following task:

- Using SNMP MIB-II ifIndex Numbers and Verifying Configuration, page 3 (required)

Using SNMP MIB-II ifIndex Numbers and Verifying Configuration

Follow the steps in this task to configure OSPF interfaces to use the SNMP MIB-II ifIndex numbers. These steps work for both OSPFv2 and OSPFv3. All OSPF interfaces must use the SNMP MIB-II ifIndex numbers or the interfaces will not be enabled for OSPF. Therefore, repeat the steps within this task for each OSPF process for which you want the interfaces to use the SNMP MIB-II ifIndex numbers.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router ospf** *process-id* [**vrf** *vpn-name*]

   or

   ipv6 router ospf *process-id*
4. **interface-id snmp-if-index**
5. **end**
6. **show snmp mib ifmib ifindex** [*interface-type*] [*slot/*][*port-adapter/*][*port*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

Step 3	**router ospf** *process-id* [**vrf** *vpn-name*]
	or
	ipv6 router ospf *process-id*
	
	Example:
	`Router(config)# router ospf 4`
	or
	`Router(config)# ipv6 router ospf 4`
		Configures an OSPFv2 routing process and enters router configuration mode.
		Configures an OSPFv3 routing process and enters router configuration mode.

Step 4	**interface-id snmp-if-index** **Example:** `Router(config-router)# interface-id snmp-if-index`	Configures OSPF interfaces with the SNMP interface index identification numbers (ifIndex values).
Step 5	**end** **Example:** `Router(config-router)# end`	Returns to privileged EXEC mode.
Step 6	**show snmp mib ifmib ifindex** [*interface-type*] [*slot*/][*port-adapter*/][*port*] **Example:** `Router# show snmp mib ifmib ifindex Ethernet 0/1`	Displays SNMP interface index identification numbers (ifIndex values) for all the system interfaces or the specified system interface.

Configuration Examples for OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

This section contains the following examples:

Configuring the SNMP ifIndex Value for Interface ID for OSPFv2: Example

The following example configures the OSPF interfaces to use the SNMP ifIndex values for the interfaces IDs. The **show snmp mib ifmib ifindex** command confirms that the SNMP MIB-II ifIndex values are used for the Interface ID values in the OSPFv2 data fields.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# router ospf 1
Router(config-router)# interface-id snmp-if-index
Router(config-router)# ^Z
Router# show ip ospf 1 1 data router self

            OSPF Router with ID (172.16.0.1) (Process ID 1)

                Router Link States (Area 1)

   LS age: 6
   Options: (No TOS-capability, DC)
   LS Type: Router Links
   Link State ID: 172.16.0.1
   Advertising Router: 172.16.0.1
   LS Seq Number: 80000007
   Checksum: 0x63AF
   Length: 48
   Area Border Router
   Number of Links: 2

     Link connected to: another Router (point-to-point)
      (Link ID) Neighboring Router ID: 172.17.0.1
      (Link Data) Router Interface address: 0.0.0.53
       Number of TOS metrics: 0
        TOS 0 Metrics: 64

     Link connected to: a Stub Network
      (Link ID) Network/subnet number: 192.168.0.11
      (Link Data) Network Mask: 255.255.255.255
       Number of TOS metrics: 0
        TOS 0 Metrics: 1


Router# show snmp mib ifmib ifindex s13/0

Serial13/0: Ifindex = 53
```

Configuring the SNMP ifIndex Value for Interface ID for OSPFv3: Example

The following example configures the OSPFv3 interfaces to use the SNMP ifIndex values for the interface IDs.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# ipv6 router ospf 1
Router(config-router)# interface-id snmp-if-index
```

The output from the **show snmp mib ifmib ifindex** command confirms that the SNMP MIB-II ifIndex values are being used for the Interface ID values in the OSPFv2 data fields.

```
Router# show snmp mib ifmib ifindex Ethernet1/0

Ethernet1/0: Ifindex = 5
Router#
Router# show ipv6 ospf int

OSPF_VL0 is up, line protocol is up
  Interface ID 71
  Area 0, Process ID 1, Instance ID 0, Router ID 172.16.0.1
  Network Type VIRTUAL_LINK, Cost: 10
  Configured as demand circuit.
  Run as demand circuit.
  DoNotAge LSA allowed.
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:02
  Index 1/2/3, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.0.0.1  (Hello suppressed)
  Suppress hello for 1 neighbor(s)
Ethernet2/0 is up, line protocol is up
  Link Local Address FE80::A8BB:CCFF:FE00:6F02, Interface ID 10
  Area 0, Process ID 1, Instance ID 0, Router ID 172.16.0.1
  Network Type BROADCAST, Cost: 10
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 172.16.0.1, local address FE80::A8BB:CCFF:FE00:6F02
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:06
  Index 1/1/2, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 0
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
Ethernet1/0 is up, line protocol is up
  Link Local Address FE80::A8BB:CCFF:FE00:6F01, Interface ID 6
  Area 1, Process ID 1, Instance ID 2, Router ID 172.16.0.1
  Network Type BROADCAST, Cost: 10
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 172.16.0.1, local address FE80::A8BB:CCFF:FE00:6F01
  Backup Designated router (ID) 10.0.0.1, local address FE80::A8BB:CCFF:FE00:6E01
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:06
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 2
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.0.0.1  (Backup Designated Router)
  Suppress hello for 0 neighbor(s)
Router#
Router# show ipv6 ospf data net adv 172.16.0.1

            OSPFv3 Router with ID (172.16.0.1) (Process ID 1)

                Net Link States (Area 1)
```

```
  LS age: 144
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Network Links
  Link State ID: 6 (Interface ID of Designated Router)
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000001
  Checksum: 0x1FC0
  Length: 32
        Attached Router: 172.16.0.1
        Attached Router: 10.0.0.1

Router# show ipv6 ospf data prefix adv 172.16.0.1

            OSPFv3 Router with ID (172.16.0.1) (Process ID 1)

                Intra Area Prefix Link States (Area 0)

  Routing Bit Set on this LSA
  LS age: 196
  LS Type: Intra-Area-Prefix-LSA
  Link State ID: 0
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000001
  Checksum: 0x6F11
  Length: 44
  Referenced LSA Type: 2001
  Referenced Link State ID: 0
  Referenced Advertising Router: 172.16.0.1
  Number of Prefixes: 1
  Prefix Address: 2002:0:2::
  Prefix Length: 64, Options: None, Metric: 10


                Intra Area Prefix Link States (Area 1)

  Routing Bit Set on this LSA
  LS age: 161
  LS Type: Intra-Area-Prefix-LSA
  Link State ID: 0
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000001
  Checksum: 0xB6E7
  Length: 52
  Referenced LSA Type: 2001
  Referenced Link State ID: 0
  Referenced Advertising Router: 172.16.0.1
  Number of Prefixes: 1
  Prefix Address: 2002:0:2:0:A8BB:CCFF:FE00:6F02
  Prefix Length: 128, Options: LA , Metric: 0

  Routing Bit Set on this LSA
  LS age: 151
  LS Type: Intra-Area-Prefix-LSA
  Link State ID: 1006
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000001
  Checksum: 0x6E24
  Length: 44
  Referenced LSA Type: 2002
  Referenced Link State ID: 6
  Referenced Advertising Router: 172.16.0.1
  Number of Prefixes: 1
  Prefix Address: 2002:0:1::
  Prefix Length: 64, Options: None, Metric: 0
```

```
Router#
Router# show ipv6 ospf data router

            OSPFv3 Router with ID (10.0.0.1) (Process ID 1)

                Router Link States (Area 0)

  Routing Bit Set on this LSA
  LS age: 5 (DoNotAge)
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Router Links
  Link State ID: 0
  Advertising Router: 10.0.0.1
  LS Seq Number: 80000004
  Checksum: 0xEE5C
  Length: 40
  Area Border Router
  Number of Links: 1

    Link connected to: a Virtual Link
      Link Metric: 10
      Local Interface ID: 70
      Neighbor Interface ID: 71
      Neighbor Router ID: 172.16.0.1


  LS age: 162
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Router Links
  Link State ID: 0
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000004
  Checksum: 0xCE7C
  Length: 40
  Area Border Router
  Number of Links: 1

    Link connected to: a Virtual Link
      Link Metric: 10
      Local Interface ID: 71
      Neighbor Interface ID: 70
      Neighbor Router ID: 10.0.0.1



                Router Link States (Area 1)

  Routing Bit Set on this LSA
  LS age: 176
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Router Links
  Link State ID: 0
  Advertising Router: 10.0.0.1
  LS Seq Number: 80000003
  Checksum: 0xC807
  Length: 40
  Area Border Router
  Number of Links: 1

    Link connected to: a Transit Network
      Link Metric: 10
      Local Interface ID: 6
      Neighbor (DR) Interface ID: 6
```

```
      Neighbor (DR) Router ID: 172.16.0.1

  LS age: 175
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Router Links
  Link State ID: 0
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000004
  Checksum: 0xBD10
  Length: 40
  Area Border Router
  Number of Links: 1

    Link connected to: a Transit Network
      Link Metric: 10
      Local Interface ID: 6
      Neighbor (DR) Interface ID: 6
      Neighbor (DR) Router ID: 172.16.0.1


Router#
Router# show ipv6 ospf data link adv 172.16.0.1

            OSPFv3 Router with ID (172.16.0.1) (Process ID 1)

                Link (Type-8) Link States (Area 0)

  LS age: 245
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Link-LSA (Interface: Ethernet2/0)
  Link State ID: 10 (Interface ID)
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000002
  Checksum: 0xA0CB
  Length: 56
  Router Priority: 1
  Link Local Address: FE80::A8BB:CCFF:FE00:6F02
  Number of Prefixes: 1
  Prefix Address: 2002:0:2::
  Prefix Length: 64, Options: None


                Link (Type-8) Link States (Area 1)

  LS age: 250
  Options: (V6-Bit E-Bit R-bit DC-Bit)
  LS Type: Link-LSA (Interface: Ethernet1/0)
  Link State ID: 6 (Interface ID)
  Advertising Router: 172.16.0.1
  LS Seq Number: 80000001
  Checksum: 0x4F94
  Length: 44
  Router Priority: 1
  Link Local Address: FE80::A8BB:CCFF:FE00:6F01
  Number of Prefixes: 0
```

Additional References

The following sections provide references related to the OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields feature.

Related Documents

Related Topic	Document Title
OSPF commands	• *Cisco IOS IP Routing Protocols Command Reference*, Release 12.4T • *Cisco IOS IP Routing Protocols Command Reference*, Release 12.2SB • *Cisco IOS IP Routing Protocols Command Reference*, Release 12.2SR
OSPF configuration	*Cisco IOS IP Routing Protocols Configuration Guide*, Release 12.4

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 2328	*OSPF Version 2*
RFC 2740	*OSPF Version 3*

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com.	http://www.cisco.com/techsupport

Command Reference

This section documents the following command only.

- **interface-id snmp-if-index**

interface-id snmp-if-index

To configure Open Shortest Path First (OSPF) interfaces with SNMP MIB-II ifIndex (Interface Index) identification numbers, use the **interface-id snmp-if-index** command in router configuration mode. To revert back to the original interface numbering, use the **no** form of this command.

interface-id snmp-if-index

no interface-id snmp-if-index

Syntax Description

This command has no arguments or keywords.

Command Default

SNMP MIB-II ifIndex numbering for interfaces is disabled.

Command Modes

Router configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.

Usage Guidelines

The advantage to using SNMP MIB-II ifIndex numbers to identify OSPF interfaces is that the ifIndex number corresponds to the number that a user will see reported by Simple Network Management Protocol (SNMP). Using the SNMP MIB-II ifIndex is also suggested, but not required, by RFC 2328 for OSPFv2 and by RFC 2740 for OSPFv3.

If you want to use the SNMP MIB-II ifIndex numbers, all interfaces that have OSPF enabled must have an SNMP ifIndex number assigned or else OSPF will not be enabled on those interfaces.

Note A user may choose not to configure SNMP MIB-II ifIndex numbers in order to maintain consistent behavior across upgrades and among routers that may not have the functionality offered with Cisco IOS Release 12.4(6)T and later releases.

Examples

The following example configures the OSPF interfaces to use SNMP MIB-II ifIndex ID numbers. The output from the **show snmp mib ifmib ifindex** command verifies the configuration.

```
Router> enable
Router# configure terminal
Router(config)# router ospf 1
Router(config-router)# interface-id snmp-if-index
Router(config-router)# end
Router# show snmp mib ifmib ifindex serial13/0

Serial13/0: Ifindex = 53
```

```
Router# show ip ospf 1 1 data router self

            OSPF Router with ID (10.0.0.3) (Process ID 1)

                 Router Link States (Area 1)

  LS age: 245
  Options: (No TOS-capability, DC)
  LS Type: Router Links
  Link State ID: 10.0.0.3
  Advertising Router: 10.0.0.3
  LS Seq Number: 80000006
  Checksum: 0x739F
  Length: 48
  Area Border Router
  Number of Links: 2

    Link connected to: another Router (point-to-point)
     (Link ID) Neighboring Router ID: 10.1.0.1
     (Link Data) Router Interface address: 0.0.0.54
      Number of TOS metrics: 0
       TOS 0 Metrics: 64

     Link connected to: a Stub Network
     (Link ID) Network/subnet number: 192.168.0.11
     (Link Data) Network Mask: 255.255.255.255
     Number of TOS metrics: 0
      TOS 0 Metrics: 1
```

Related Commands

Command	Description
show snmp mib ifmib ifindex	Displays SNMP interface index identification numbers (ifIndex values) for all the system interfaces or the specified system interface.

Feature Information for OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields

Feature Name	Releases	Feature Information
OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields	12.4(6)T 12.2(31)SB2 12.2(33)SRB	This document describes the configuration command that allows you the choice to use either the current interface number or the SNMP ifIndex value for the interface ID in OSPFv2 and OSPFv3 data fields. The advantage to using the SNMP MIB-II ifIndex value is that this number corresponds to the number that the user will see reported by SNMP.

Glossary

SNMP—Simple Network Management Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite.

Note See *Internetworking Terms and Acronyms* for terms not included in this glossary.