



OSPF SNMP ifIndex Value for Interface ID in Data Fields

This feature allows you to configure the interface ID value Open Shortest Path First version 2 (OSPFv2) and Open Shortest Path First version 3 (OSPFv3) data fields. You can choose to use either the current interface number or the Simple Network Management Protocol (SNMP) MIB-II interface index (ifIndex) value for the interface ID. 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.

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Prerequisites for SNMP ifIndex Value for Interface ID in Data Fields

Before you can use the SNMP ifIndex value for interface identification, OSPF must be configured on the router.

Information About SNMP ifIndex Value for Interface ID in Data Fields

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

If you use 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 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.

- In the 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.
- In the output from 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 SNMP ifIndex Value for Interface ID in Data Fields

Configuring OSPF interfaces to use SNMP MIB-II ifIndex Numbers

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. Do one of the following:
 - **router ospf** *process-id* [**vrf** *vpn-name*]
 -
 - **ipv6 router ospf** *process-id*
4. **interface-id snmp-if-index**

5. **end**
6. **show snmp mib ifmib ifindex** *[type number]* **[detail][free-list]**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	Do one of the following: • router ospf <i>process-id</i> [vrf vpn-name] • ipv6 router ospf <i>process-id</i> Example: <pre>Device(config)# router ospf 4</pre> Example: <pre>Device(config)# ipv6 router ospf 4</pre>	Configures an OSPFv2 routing process and enters router configuration mode. Configures an OSPFv3 routing process and enters router configuration mode. Note If you configure an OSPFv3 routing process, that uses IPv6, you must have already enabled IPv6.
Step 4	interface-id snmp-if-index Example: <pre>Device(config-router)# interface-id snmp-if-index</pre>	Configures OSPF interfaces with the SNMP interface index identification numbers (ifIndex values).
Step 5	end Example: <pre>Device(config-router)# end</pre>	Returns to privileged EXEC mode. Repeat this task for each OSPF process for which you want the interfaces to use the SNMP MIB-II ifIndex numbers.
Step 6	show snmp mib ifmib ifindex <i>[type number]</i> [detail][free-list] Example:	Displays SNMP interface index identification numbers (ifIndex values) for all the system interfaces or the specified system interface.

	Command or Action	Purpose
	Device# show snmp mib ifmib ifindex GigabitEthernet 0/0	

Configuration Examples for SNMP ifIndex Value for Interface ID in Data Fields

Example Configuring SNMP ifIndex Value for Interface ID for OSPFv2

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.

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# router ospf 1
Device(config-router)# interface-id snmp-if-index
Device(config-router)# ^Z
Device# 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
Device# show snmp mib ifmib ifindex serial 13/0

Serial13/0: Ifindex = 53
```

Example Configuring SNMP ifIndex Value for Interface ID for OSPFv3

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

```
Device# configure terminal
```

```

Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ipv6 router ospf 1
Device(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:

```

Device# show snmp mib ifmib ifindex GigabitEthernet 0/0/0
0/0/0: Ifindex = 5
Device# show ipv6 ospf interface
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)
GigabitEthernet 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)
GigabitEthernet 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)
Device# show ipv6 ospf database network adv-router 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)

```

Example Configuring SNMP ifIndex Value for Interface ID for OSPFv3

```

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
Device# show ipv6 ospf database prefix adv-router 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
Device# show ipv6 ospf database 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
Device# show ipv6 ospf database link adv-router 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: GigabitEthernet2/0)
  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: GigabitEthernet1/0)
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

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
OSPF commands	Cisco IOS IP Routing: OSPF Command Reference
Protecting TE tunnel interfaces	MPLS Traffic Engineering--Fast Reroute Link and Node Protection section in the <i>Cisco IOS Multiprotocol Label Switching Configuration Guide</i>

Standards

Standard	Title
No new or modified standards are supported, and support for existing standards has not been modified.	--

MIBs

MIB	MIBs Link
•	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 5286	Basic Specification for IP Fast Reroute: Loop-Free Alternates

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for OSPF SNMP ifIndex Value for Interface ID

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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

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	Cisco IOS XE Release 2.6	This allows you to choose 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. The following command is introduced or modified by the feature documented in this module: interface-id snmp-if-index

Table 2: 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	Cisco IOS XE Release 17.4	This feature was introduced.

