

Interface Index Persistence

This feature module describes the Interface Index Persistence feature introduced in Cisco IOS Release 12.1(5)T. This enhancement allows interfaces to be identified with unique values which will remain constant even when a device is rebooted. These interface identification values are used for network monitoring and management using Simple Network Management Protocol (SNMP). This document includes the following sections:

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Feature Overview

One of the identifiers most commonly used in SNMP-based network management applications is the interface index (ifIndex) value. IfIndex is a unique identifying number associated with a physical or logical interface; as far as most software is concerned, the ifIndex is the “name” of the interface.

Although there is no requirement in the relevant RFCs that the correspondence between particular ifIndex values and their interfaces be maintained across reboots, applications such as device inventory, billing, and fault detection increasingly depend on the maintenance of this correspondence.

Cisco IOS Release 12.1(5)T adds support for an ifIndex value that can persist across reboots, allowing users to avoid the workarounds previously required for consistent interface identification.

It is currently possible to poll the router at regular intervals to correlate the interfaces to the ifIndex, but it is not practical to poll this interface constantly. If this data is not correlated constantly, however, the data may be made invalid because of a reboot or the insertion of a new card into the router in between polls. Therefore, ifIndex persistence is the only way to guarantee data integrity.

IfIndex persistence means that the mapping between the ifDescr object values and the ifIndex object values (generated from the IF-MIB) will be retained across reboots.

Benefits

Association of Interfaces with Traffic Targets for Network Management

The Interface Index Persistence feature allows for greater accuracy when collecting and processing network management data by uniquely identifying input and output interfaces for traffic flows and SNMP statistics. Relating each interface to a known entity (such as an ISP customer) allows network management data to be more effectively utilized.

Accuracy for Mediation, Fault Detection, and Billing

Network data is increasingly being used worldwide for usage-based billing, network planning, policy enforcement, and trend analysis. The ifIndex information is used to identify input and output interfaces for traffic flows and SNMP statistics. Inability to reliably relate each interface to a known entity, such as a customer, invalidates the data.

Restrictions

The interface-specific ifIndex persistence command (**[no] snmp ifindex persistence**) cannot be used on subinterfaces. A command applied to an interface is automatically applied to all the subinterfaces associated with that interface.

Testing indicates that approximately 25 bytes of NVRAM storage are used by this feature per interface. There may be some boot delay exhibited on platforms with lower CPU speeds.

Related Features and Technologies

- Event MIB
- Expression MIB
- RMON (Remote Monitoring)
- SNMP (Simple Network Management Protocol)

Related Documents

- The “Configuring SNMP Support” chapter of the *Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.1* (available on CCO)
- The “SNMP Commands” chapter of the *Cisco IOS Configuration Fundamentals Command Reference, Release 12.1* (available on CCO)
- “Ethernet-like Interfaces MIB and Interfaces Group MIB Enhancements” Feature Module, Cisco IOS Release 12.1(2)T (available on CCO).
- RFC 2233, “The Interfaces Group MIB using SMIV2”

RFCs are available from a variety of internet sources. The primary source is the IETF’s web site at <http://www.ietf.org>

Supported Platforms

This feature is supported on images for the following platforms in Cisco IOS release 12.1(5)T and later:

- Cisco 800 series
- Cisco 1400 series
- Cisco 1600 series (including the 1600R series)
- Cisco 1700 series
- Cisco 2500 series
- Cisco 2600 series
- Cisco 2800 series
- Cisco 3600 series (including the Cisco 3620, 3640, and 3660)
- Cisco 3800 series
- Cisco 4500 series
- Cisco AS5300
- Cisco AS5400
- Cisco AS5800
- Cisco 7100 series
- Cisco 7200 series (including the Cisco 7202, 7204, and 7206)
- Cisco 7500 series (including the Cisco RSP7000)

The Interface Index Persistence feature is also supported on the following platforms in Cisco IOS release 12.0(11)S and later:

- Cisco 7200 Series
- Cisco 7500 Series
- Cisco 12000 GSR Family

For more information about the Cisco IOS software release process, and the latest information about feature support by platform, see Cisco.com.

Supported Standards, MIBs, and RFCs, and MIBs

The Interface Index Persistence feature supports the following standards, MIBs, and RFCs:

Standards

None (ifIndex persistence is not required by RFC2233).

MIBs

- Interfaces MIB (IF-MIB)

Note that this feature does not change any existing MIBs or add any new MIBs.

To obtain lists of MIBs supported by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

RFCs

- RFC 2233, “The Interfaces Group MIB using SMIV2”

Prerequisites

The configuration tasks described in the next section assume that you have configured SNMP on your routing device and are using SNMP to monitor network activity using the Cisco IOS command line interface and/or a network management system (NMS) application.

Configuration Tasks

See the following sections for configuration tasks for the Interface Index Persistence feature. Each task in the list is identified as optional or required.

- Enabling and Disabling IfIndex Persistence Globally (Optional)
- Enabling and Disabling IfIndex Persistence on Specific Interfaces (Optional)

Enabling and Disabling IfIndex Persistence Globally

IfIndex persistence is disabled by default. To globally enable ifIndex values that are maintained across reboots, use the following command in global configuration mode:

Command	Purpose
Router(config)# snmp-server ifindex persist	Globally enables ifIndex values that will remain constant across reboots.

To globally disable ifIndex persistence after enabling it, use the following command in global configuration mode:

Command	Purpose
Router(config)# no snmp-server ifindex persist	Disables global ifIndex persistence.

**Note**

After ifIndex persistence commands have been entered, the configuration must be saved using the **copy running-config startup-config** EXEC mode command to ensure consistent ifIndex values.

Enabling and Disabling IfIndex Persistence on Specific Interfaces

To enable ifIndex persistence only on a specific interface, use the following commands, starting in global configuration mode:

	Command	Purpose
Step 1	Router(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface. Note that the syntax of the interface command will vary depending on the platform you are using.
Step 2	Router(config-if)# snmp ifindex persist	Enables an ifIndex value that is constant across reboots on the specified interface.
Step 3	Router(config-if)# exit	Exits interface configuration mode.

To disable ifIndex persistence only on a specific interface, use the following commands, starting in global configuration mode:

	Command	Purpose
Step 1	Router(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface. Note that the syntax of the interface command will vary depending on the platform you are using.
Step 2	Router(config-if)# no snmp ifindex persist	Disables an ifIndex value that is constant across reboots on the specified interface.
Step 3	Router(config-if)# exit	Exits interface configuration mode.

To clear the interface-specific ifIndex persistence setting and configure the interface to use the global configuration setting, use the following commands, starting in global configuration mode:

	Command	Purpose
Step 1	Router(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface. Note that the syntax of the interface command will vary depending on the platform you are using.
Step 2	Router(config-if)# snmp ifindex clear	Clears any interface-specific ifIndex persistence configuration for the specified interface. The ifIndex setting (enabled or disabled) will match the global configuration setting.
Step 3	Router(config-if)# exit	Exits interface configuration mode.

When you clear the interface-specific setting, only the global ifIndex persistence setting will apply to the interface. Regardless of whether the specific interface has ifIndex persistence enabled or disabled, the ifIndex persistence setting will default to the global setting after you issue the **snmp ifindex clear** command.

For example, assume that you enabled ifIndex persistence on interface ethernet 0/1, and then globally enabled ifIndex persistence. Using the **snmp ifindex clear** command in interface configuration mode for ethernet 0/1 would leave that interface with ifIndex enabled, because the global setting is to have ifIndex persistence enabled.

Likewise, if you disabled ifIndex persistence for ethernet 0/1, globally enabled ifIndex persistence, and then issued the **snmp ifindex clear** command on that interface, ifIndex would be enabled (according to the global setting) on that interface.



Tips

Use the **snmp ifindex clear** command on a specific interface when you want that interface to use the global configuration setting for ifIndex persistence. This command clears any ifIndex configuration commands previously entered for that specific interface.

Verifying IfIndex Persistence

Use the **more system:running-config** command to verify that ifIndex commands have been configured.

Configuration Examples

This section provides the following configuration examples:

- Enabling IfIndex Persistence on All Interfaces Example
- Enabling IfIndex Persistence on a Specific Interface Example
- Disabling IfIndex Persistence on a Specific Interface Example
- Clearing IfIndex Persistence Configuration from a Specific Interface Example

Enabling IfIndex Persistence on All Interfaces Example

In the following example, ifIndex persistence is enabled for all interfaces:

```
router(config)# snmp-server ifindex persist
```

Enabling IfIndex Persistence on a Specific Interface Example

In the following example, ifIndex persistence is enabled for interface *ethernet 0/1* only:

```
router(config)# interface ethernet 0/1  
router(config-if)# snmp ifindex persist  
router(config-if)# exit
```

Disabling IfIndex Persistence on a Specific Interface Example

In the following example, ifIndex persistence is disabled for interface *ethernet 0/1* only:

```
router(config)# interface ethernet 0/1  
router(config-if)# no snmp ifindex persist  
router(config-if)# exit
```

Clearing IfIndex Persistence Configuration from a Specific Interface Example

In the following example, any previous setting for ifIndex persistence on interface *ethernet 0/1* is removed from the configuration. If ifIndex persistence is globally enabled, ifIndex persistence will be enabled for *ethernet 0/1*. If ifIndex persistence is globally disabled, ifIndex persistence will be disabled for *ethernet 0/1*.

```
router(config)# interface ethernet 0/1  
router(config-if)# snmp ifindex clear  
router(config-if)# exit
```

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.1 command reference publications.

- **snmp ifindex clear**
- **snmp ifindex persist**
- **snmp-server ifindex persist**

snmp ifindex clear

To clear any previously configured snmp ifIndex commands issued in interface configuration mode for a specific interface, use the **snmp ifindex clear** command in interface configuration mode.

snmp ifindex clear

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

Command History	Release	Modification
	12.0(11)S	This command was introduced.
	12.1(5)T	This command was integrated into the 12.1 T release train.

Usage Guidelines Interface Index Persistence means that ifIndex values in the IF-MIB persist across reboots, allowing for consistent identification of specific interfaces using SNMP.

Use the **snmp ifindex clear** command on a specific interface when you want that interface to use the global configuration setting for ifIndex persistence. This command clears any ifIndex configuration commands previously entered for that specific interface.

Examples In the following example, ifIndex persistence is enabled for all interfaces:

```
router(config)# snmp-server ifindex persist
```

IfIndex persistence is then disabled for ethernet 0/1 only:

```
router(config)# interface ethernet 0/1
router(config-if)# no snmp ifindex persist
router(config-if)# exit
```

Later, the ifIndex configuration command is cleared from the configuration for ethernet 0/1:

```
router(config)# interface ethernet 0/1
router(config-if)# snmp ifindex clear
router(config-if)# exit
```

This leaves ifIndex persistence enabled for all interfaces, as specified by the **snmp-server ifindex persist** global configuration command.

Related Commands	Command	Description
	snmp ifindex persist	Enables or disables ifIndex values in the IF-MIB that persist across reboots for a specified interface.
	snmp-server ifindex persist	Enables or disables ifIndex values in the IF-MIB that persist across reboots for all interfaces which are not specifically configured for ifIndex persistence.

snmp ifindex persist

To enable ifIndex values in the Interfaces MIB (IF-MIB) that persist across reboots (ifIndex persistence) only on a specific interface, use the **snmp ifindex persist** command in interface configuration mode. To disable ifIndex persistence only a specific interface, use the **no** form of this command.

snmp ifindex persist

no snmp ifindex persist

Syntax Description This command has no arguments or keywords.

Defaults This command is disabled by default.

Command Modes Interface configuration mode

Command History	Release	Modification
	12.0(11)S	This command was introduced.
	12.1(5)T	This command was integrated into the 12.1 T release train.

Usage Guidelines Interface Index Persistence means that ifIndex values in the IF-MIB persist across reboots, allowing for consistent identification of specific interfaces using SNMP.

The **snmp ifindex persistence interface** configuration command enables and disables ifIndex persistence for individual entries (corresponding to individual interfaces) in the ifIndex table of the IF-MIB.

The **snmp-server ifindex persistence global** configuration command enables and disables ifIndex persistence for all interfaces on the routing device (this applies only to interfaces that have ifDescr and ifIndex entries in the ifIndex table of the IF-MIB).

IfIndex commands configured for an interface apply to all subinterfaces on that interface.

Examples In the following example, ifIndex persistence is enabled for interface ethernet 0/1 only:

```
router(config)# interface ethernet 0/1
router(config-if)# snmp ifindex persist
router(config-if)# exit
```

In the following example, ifIndex persistence is enabled for all interfaces, then disabled for interface ethernet 0/1 only:

```
router(config)# snmp-server ifindex persist
router(config)# interface ethernet 0/1
router(config-if)# no snmp ifindex persist
router(config-if)# exit
```


Related Commands

Command	Description
snmp ifindex clear	Clears any interface-specific configuration of ifIndex persistence.
snmp-server ifindex persist	Enables or disables ifIndex values in the IF-MIB that persist across reboots for all interfaces that are not specifically configured for ifIndex persistence.

snmp-server ifindex persist

To globally enable ifIndex values which will remain constant across reboots for use by SNMP, use the **snmp-server ifindex persist** command in global configuration mode. To globally disable ifIndex persistence, use the **no** form of this command in global configuration mode.

snmp-server ifindex persist

no snmp-server ifindex persist

Syntax Description This command has no arguments or keywords.

Defaults This command is disabled by default.

Command Modes Global configuration mode

Command History

Release	Modification
12.0(11)S	This command was introduced.
12.1(5)T	This command was integrated into the 12.1 T release train.

Usage Guidelines

Interface Index Persistence means that ifIndex values in the IF-MIB persist across reboots, allowing for consistent identification of specific interfaces using SNMP.

The **snmp-server ifindex persist** global configuration command will not override interface-specific configuration. Interface-specific configuration of ifIndex persistence is performed with the **[no] snmp ifindex persist** and **snmp ifindex clear** interface configuration commands.

The **[no] snmp-server ifindex persist** global configuration command enables and disables ifIndex persistence for all interfaces on the routing device using ifDescr and ifIndex entries in the ifIndex table of the IF-MIB.

Examples

In the following example, ifIndex persistence is enabled for all interfaces:

```
router(config)# snmp-server ifindex persist
```

Note that in this example if ifIndex persistence was previously disabled for a specific interface using the **no snmp ifindex persist** interface configuration mode command, ifIndex persistence will remain disabled for that interface. The global ifIndex command does not override the interface specific commands.

Related Commands

Command	Description
snmp ifindex persist	Enables or disables ifIndex values in the IF-MIB which persist across reboots (ifIndex persistence) only on a specific interface.
snmp-server ifindex clear	Clears any interface-specific configuration of ifIndex persistence.

Glossary

The following definitions are based on RFC 2233, “The Interfaces Group MIB using SMIv2.” The terms are values in the Interfaces MIB (IF-MIB).

ifIndex—A unique number (greater than zero) that identifies each interface for the purposes of SNMP identification of that interface.

ifName—The text-based name of the interface. For example, “ethernet 0/1.”

ifDescr—A description of the interface. Recommended information for this description includes the name of the manufacturer, the product name and the version of the interface hardware/software.