

IP SLAs ICMP Path Echo Operation

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Feature History for IP SLAs - ICMP Path Echo Operation

This table provides release and platform support information for the features explained in this module.

These features are available in all the releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature Name and Description	Supported Platform
Cisco IOS XE 26.2.1ea	IP SLAs - CMP Path Echo Operation: IP SLAs - CMP Path Echo Operation feature support has been introduced.	Cisco C9550 Series Smart Switches
Cisco IOS XE 17.18.1	IP SLAs - ICMP Path Echo Operation: This operation monitors both end-to-end and hop-by-hop response times between a Cisco device and other IP-enabled devices.	Cisco C9350 Series Smart Switches Cisco C9610 Series Smart Switches

IP SLAs ICMP Path Echo

IP SLAs ICMP Path Echo operation allows for monitoring both end-to-end and hop-by-hop response times between a Cisco device and other IP-enabled devices. By sending Internet Control Message Protocol (ICMP) packets along the network path, this operation helps network administrators assess network availability and efficiently troubleshoot connectivity issues. The collected results provide insights into the performance of ICMP across the network, allowing for detailed analysis of response times at each hop and enabling proactive identification and resolution of potential network problems.

How IP SLAs ICMP path echo works

To monitor ICMP Path Echo performance on a device, the IP SLAs ICMP Path Echo operation can be utilized. This operation measures both end-to-end and hop-by-hop response times between a Cisco device and other IP-enabled devices. By providing detailed response time data, ICMP Path Echo helps network administrators determine network availability and effectively troubleshoot network connectivity issues, ensuring optimal network performance and reliability.

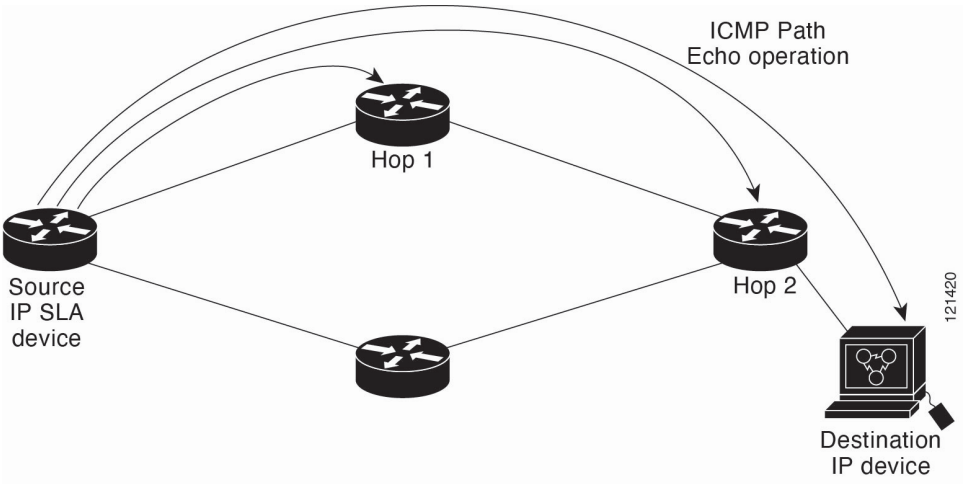
Summary

The IP SLAs ICMP Path Echo operation records detailed statistics for each hop along the network path taken to reach its destination. By leveraging the traceroute facility, this operation identifies each hop and measures the response time between a Cisco device and any IP device on the network. This hop-by-hop analysis enables precise monitoring and troubleshooting, allowing network administrators to pinpoint delays or issues at specific points along the path.

In the figure below the source IP SLAs device uses traceroute to discover the path to the destination IP device. A ping is then used to measure the response time between the source IP SLAs device and each subsequent hop in the path to the destination IP device.

Workflow

Figure 1: ICMP Path Echo Operation



Using the statistics recorded for the response times and availability, the ICMP Path Echo operation can identify a hop in the path that is causing a bottleneck.

Guidelines to configure IP SLAs ICMP Path Echo Operations

We recommend using a Cisco networking device as the destination device although any networking device that supports RFC 862, Echo protocol, can be used.

Configure an IP SLAs ICMP Path Echo operations on the source device

Follow the steps in each of these tasks to configure an ICMP Path Echo operations on the source device.

Before you begin

This operation does not require an IP SLAs Responder on the destination device.

Procedure

Step 1 Perform any one of these tasks:

- Configure a basic ICMP path echo operation on the source device
- Configure an ICMP path echo operation with optional parameters on the source device

Step 2 Schedule IP SLAs operations

Configure a basic ICMP path echo operation on the source device

Before you begin

This operation does not require an IP SLAs Responder on the destination device.

Perform this task to configure a basic ICMP path echo operation on the source device.

Procedure

Step 1 **enable**

Example:

```
Device> enable
```

Enables privileged EXEC mode.

Enter your password, if prompted.

Step 2 **configure terminal**

Example:

```
Device# configure terminal
```

Enters global configuration mode.

Step 3 **ip sla** *operation-number*

Example:

```
Device(config)# ip sla 10
```

Starts configuring an IP SLAs operation and enters IP SLA configuration mode.

Step 4 **path-echo** {*destination-ip-address* | *destination-hostname*} [**source-ip** {*ip-address* | *hostname*}]

Example:

```
Device(config-ip-sla)# path-echo 172.29.139.134
```

Defines a path echo operation and enters IP SLA path echo configuration mode.

- *destination-ip-address*: The IP address of the target device to which the path echo operation will be sent.
- *destination-hostname*: The hostname of the target device (as an alternative to specifying the IP address).
- **source-ip** {*ip-address* | *hostname*}: (Optional) Specifies the source IP address or hostname from which the operation is initiated.

Step 5 **frequency** *seconds*

Example:

```
Device(config-ip-sla-pathEcho)# frequency 30
```

(Optional) Sets the rate at which a specified IP SLAs operation repeats.

Step 6 **end**

Example:

```
Device(config-ip-sla-pathEcho)# end
```

Exits to privileged EXEC mode.

Configure an ICMP path echo operation with optional parameters on the source device

Perform this task to configure an ICMP path echo operation with optional parameters on the source device.

Procedure

Step 1 **enable**

Example:

```
Device> enable
```

Enables privileged EXEC mode.

Enter your password, if prompted.

Step 2 **configure terminal**

Example:

```
Device# configure terminal
```

Enters global configuration mode.

Step 3 **ip sla** *operation-number*

Example:

```
Device(config)# ip sla 10
```

Starts configuring an IP SLAs operation and enters IP SLA configuration mode.

Step 4 **path-echo** {*destination-ip-address* | *destination-hostname*} [**source-ip** {*ip-address* | *hostname*}]

Example:

```
Device(config-ip-sla)# path-echo 172.29.139.134
```

Defines a path echo operation and enters IP SLA path echo configuration mode.

- *destination-ip-address*: The IP address of the target device to which the path echo operation will be sent.
- *destination-hostname*: The hostname of the target device (as an alternative to specifying the IP address).
- **source-ip** {*ip-address* | *hostname*}: (Optional) Specifies the source IP address or hostname from which the operation is initiated.

Step 5 **history buckets-kept** *size*

Example:

```
Device(config-ip-sla-pathEcho)# history buckets-kept 25
```

(Optional) Sets the number of history buckets that are kept during the lifetime of an IP SLAs operation.

Step 6 **history distributions-of-statistics-kept** *size*

Example:

```
Device(config-ip-sla-pathEcho)# history distributions-of-statistics-kept 5
```

(Optional) Sets the number of statistics distributions kept per hop during an IP SLAs operation.

Step 7 **history enhanced** [**interval** *seconds*] [**buckets** *number-of-buckets*]

Example:

```
Device(config-ip-sla-pathEcho)# history enhanced interval 900 buckets 100
```

(Optional) Enables enhanced history gathering for an IP SLAs operation.

- **interval** *seconds*: (Optional) The time interval, in seconds, at which statistics are recorded.
- **buckets** *number-of-buckets*: (Optional) The number of history buckets (data storage slots) to retain for the operation.

Step 8 **history filter** {**none** | **all** | **overThreshold** | **failures**}

Example:

```
Device(config-ip-sla-pathEcho)# history filter failures
```

(Optional) Defines the type of information kept in the history table for an IP SLAs operation.

Step 9 **frequency** *seconds*

Example:

```
Device(config-ip-sla-pathEcho)# frequency 30
```

(Optional) Sets the rate at which a specified IP SLAs operation repeats.

Step 10 **history hours-of-statistics-kept** *hours*

Example:

```
Device(config-ip-sla-pathEcho)# history hours-of-statistics-kept 4
```

(Optional) Sets the number of hours for which statistics are maintained for an IP SLAs operation.

Step 11 **history lives-kept** *lives*

Example:

```
Device(config-ip-sla-pathEcho)# history lives-kept 5
```

(Optional) Sets the number of lives maintained in the history table for an IP SLAs operation.

Step 12 **owner** *owner-id*

Example:

```
Device(config-ip-sla-pathEcho)# owner admin
```

(Optional) Configures the Simple Network Management Protocol (SNMP) owner of an IP SLAs operation.

Step 13 **paths-of-statistics-kept** *size*

Example:

```
ice(config-ip-sla-pathEcho)# paths-of-statistics-kept 3
```

(Optional) Sets the number of paths for which statistics are maintained per hour for an IP SLAs operation.

Step 14 **request-data-size** *bytes*

Example:

```
Device(config-ip-sla-pathEcho)# request-data-size 64
```

(Optional) Sets the protocol data size in the payload of an IP SLAs operation's request packet.

Step 15 **samples-of-history-kept** *samples*

Example:

```
Device(config-ip-sla-pathEcho)# samples-of-history-kept 10
```

(Optional) Sets the number of entries kept in the history table per bucket for an IP SLAs operation.

Step 16 **history statistics-distribution-interval** *milliseconds*

Example:

```
Device(config-ip-sla-pathEcho)# history statistics-distribution-interval 10
```

(Optional) Sets the time interval for each statistics distribution kept for an IP SLAs operation.

Step 17 **tag** *text*

Example:

```
Device(config-ip-sla-pathEcho)# tag TelnetPollServer1
```

(Optional) Creates a user-specified identifier for an IP SLAs operation.

Step 18 **threshold** *milliseconds*

Example:

```
Device(config-ip-sla-pathEcho)# threshold 10000
```

(Optional) Sets the amount of time an IP SLAs operation waits for a response from its request packet.

Step 19 **tos** *number*

Example:

```
Device(config-ip-sla-pathEcho)# tos 160
```

(Optional) Defines a type of service (ToS) byte in the IP header of an IP SLAs operation.

Step 20 **verify-data**

Example:

```
Device(config-ip-sla-pathEcho)# verify-data
```

(Optional) Causes an IP SLAs operation to check each reply packet for data corruption.

Step 21 **vrf** *vrf-name*

Example:

```
Device(config-ip-sla-pathEcho)# vrf vpn-A
```

(Optional) Allows monitoring within Multiprotocol Label Switching (MPLS) Virtual Private Networks (VPNs) using IP SLAs operations.

Step 22 **end**

Example:

```
Device(config-ip-sla-pathEcho)# end
```

Exits to privileged EXEC mode.

Schedule IP SLAs operations

Perform this task to schedule IP SLAs operations.

Before you begin

- All IP SLAs operations to be scheduled must be already configured.
- The frequency of all operations scheduled in a multioperation group must be the same.
- The list of one or more operation ID numbers to be added to a multioperation group must be limited to a maximum of 125 characters in length, including commas (,).

Procedure

Step 1 **enable**

Example:

```
Device> enable
```

Enables privileged EXEC mode.

Enter your password, if prompted.

Step 2 **configure terminal**

Example:

```
Device# configure terminal
```

Enters global configuration mode.

Step 3 **ip sla schedule** *operation-number* [**life** {**forever** | *seconds*}] [**start-time** {[*hh:mm:ss*] [*month day* | *day month*] | **pending** | **now** | **after** *hh:mm:ss*}] [**ageout** *seconds*] [**recurring**]

Example:

```
Device(config)# ip sla schedule 10 life forever start-time
OR
Device(config)# ip sla schedule 1 3,4,6-9 schedule-period 50 frequency range 80-100
```

(Optional) Configures the scheduling parameters for an individual IP SLAs operation.

- *operation-number*: The IP SLA operation number to schedule (must match a previously created IP SLA operation).

  The range is from 1 to 2147483647.

- **life** {**forever** | *seconds*}: How long the operation will run.
  - **forever**: Runs the operation continuously until manually stopped.
  - *seconds*: Number of seconds the operation should run.

    The range is from 1 to 2147483647 seconds.

- **start-time** {[*hh:mm:ss*] [*month day* | *day month*] | **pending** | **now** | **after** *hh:mm:ss*}: Specifies when to start the operation.
  - *hh:mm:ss* [*month day* | *day month*]: Specific time and date.
  - **pending**: Waits for a manual start.
  - **now**: Starts immediately.
  - **after** *hh:mm:ss*: Starts after the specified amount of time.

- **ageout** *seconds*: Time (in seconds) after which the operation is automatically deleted.

  The range is from 0 to 2147483647 seconds.

- **recurring**: Makes the operation run repeatedly according to its frequency settin

Step 4 **ip sla group schedule** *group-operation-number operation-id-numbers* {**schedule-period** *schedule-period-range* |**schedule-together**}[**ageout** *seconds*] **frequency** *group-operation-frequency* [**life** {**forever** | *seconds*}] [**start-time** {*hh:mm* [*:ss*] [*month day* | *day month*] | **pending** | **now** | **after** *hh:mm*[*:ss*]}]

Example:

```
Device(config)# ip sla group schedule 10 schedule-period frequency
OR
Device(config)# ip sla group schedule 1 3,4,6-9 life forever start-time now
```

(Optional) Specifies an IP SLAs operation group number and the range of operation numbers for a multioperation scheduler.

- *group-operation-number*: The number assigned to the group operation (must be unique).

  The range is from 1 to 2147483647.

- *operation-id-numbers*: List of individual IP SLA operation numbers to be included in the group.

  The range is from 1 to 2147483647 (can be a series separated by spaces).

- **schedule-period** *schedule-period-range*: Schedules each operation in the group with a specified time period between them.

  The range is from 1 to 604800 (seconds; up to 7 days).

- **schedule-together**: Starts all operations in the group at the same time.

- **frequency** *group-operation-frequency*: How often (in seconds) the group operation runs.

  The range is from 1 to 604800 seconds.

Step 5 **end**

Example:

```
Device(config)# end
```

Exits global configuration mode and returns to privileged EXEC mode.

Configuration examples for IP SLAs ICMP Path Echo operations

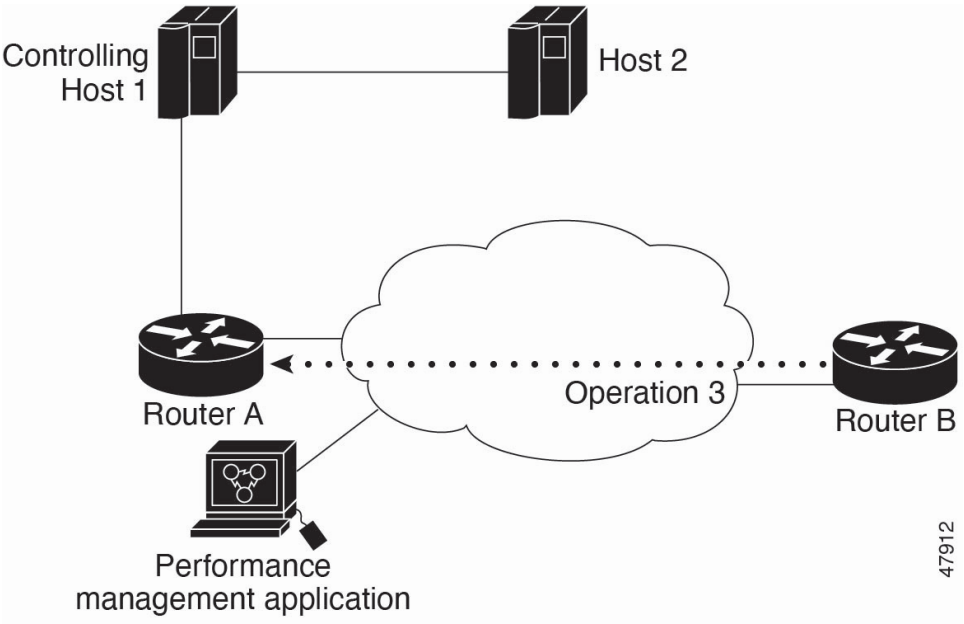
These sections provide configuration examples for IP SLAs ICMP Path Echo operation.

Example: Configure an ICMP path echo operation

The following example shows how to configure an IP SLAs operation type of ICMP Path Echo that will start after 30 seconds and run for 5 minutes.

The figure below depicts the ICMP Path Echo operation.

Figure 2: ICMP Path Echo Operation



This example sets a Path Echo operation (ip sla 3) from Device B to Device A using IP/ICMP. The operation attempts to execute three times in 25 seconds (first attempt at 0 seconds).

Device B Configuration

```
Device> enable
Device# configure terminal
Device(config)# ip sla 3
Device(config-ip-sla)# path-echo 172.29.139.134
Device(config-ip-sla-pathEcho)# frequency 10
Device(config-ip-sla-pathEcho)# tag SGN-RO
Device(config-ip-sla-pathEcho)# timeout 1000
Device(config-ip-sla-pathEcho)# ip sla schedule 3 life 25
Device(config-ip-sla-pathEcho)# end
```