

IP SLAs UDP Echo Operation

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Feature History for IP SLAs - UDP 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 - UDP Echo Operation: IP SLAs - UDP Echo Operation feature support has been introduced.	Cisco C9550 Series Smart Switches
Cisco IOS XE 17.18.1	IP SLAs - UDP Echo Operation: This operation measures the response time needed to establish a UDP connection between a Cisco device and a target device across an IP network.	Cisco C9350 Series Smart Switches Cisco C9610 Series Smart Switches

IP SLAs UDP Echo

The UDP echo operation measures the end-to-end response time between a Cisco device and other IP-enabled devices. Utilizing UDP, a transport layer (Layer 4) Internet protocol commonly used by various IP-based services, this operation sends and receives UDP packets to assess response times and test connectivity across the network. By performing these measurements, network administrators can verify overall network performance and effectively troubleshoot connectivity issues, ensuring reliable service delivery.

The results of a UDP echo operation are valuable for troubleshooting issues with business-critical applications, as they provide information on round-trip delay times and verify connectivity to both Cisco and non-Cisco devices. By analyzing these results, network administrators can identify potential performance bottlenecks and ensure reliable communication throughout the network infrastructure. This capability is essential for maintaining optimal performance and availability of important network services.

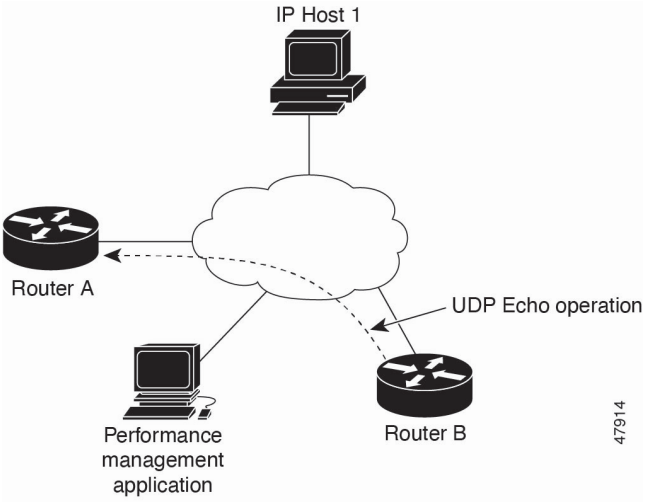
How IP SLA IP SLAs UDP echo works

Summary

In the following figure Device A has been configured as an IP SLAs Responder and Device B is configured as the source IP SLAs device.

Workflow

Figure 1: UDP Echo Operation



Response time, or round-trip time, is calculated by measuring the interval between sending a UDP echo request from Device B to the destination device, Device A, and receiving a UDP echo reply from Device A. The accuracy of the UDP echo operation is improved when the IP SLAs Responder is enabled on Device A, provided it is a Cisco device. For Cisco devices, IP SLAs can send a UDP datagram to any specified port number, and using the IP SLAs Responder is optional for UDP echo operations. However, the IP SLAs Responder feature cannot be configured on non-Cisco devices.

Configure a UDP echo operation on the source device

Follow the steps in each of these tasks to configure a UDP echo operation on the source device

Procedure

Step 1 Perform any one of these tasks:

- Configure a basic UDP echo operation on the source device
- Configure a UDP echo operation with optional parameters on the source device

Step 2 Schedule IP SLAs operations

Configure a basic UDP echo operation on the source device

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

Before you begin

If you are using the IP SLAs Responder, ensure that you have completed the "Configuring the IP SLAs Responder on the Destination Device" section before you start this task.

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 **udp-echo** {*destination-ip-addres* | *destination-hostname*} *destination-port* [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**control** {**enable** | **disable**}]

Example:

```
Device(config-ip-sla)# udp-echo 172.29.139.134 5000
```

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

Use the **control disable** keyword combination only if you disable the IP SLAs control protocol on both the source and target devices

- *destination-ip-address* | *destination-hostname*: Specifies the IP address or hostname of the target device for the UDP Jitter operation.
- *destination-port*: The UDP port number on the target device that will receive the packets.

- **source-ip** {*ip-address* | *hostname*}: (Optional) Specifies the source IP address or hostname from which packets will be sent.
- **source-port** *port-number*: (Optional) Specifies the UDP source port number for the test packets.
- **control** {**enable** | **disable**}: (Optional) Enables or disables the control protocol, which is used to notify the responder on the target device about the test.

  Use the **control disable** keyword combination only if you disable the IP SLAs control protocol on both source and destination devices.

Step 5 **data-pattern** *hex-value*

Example:

```
Device(config-ip-sla-udp)# data-pattern FFFFFFFF
```

(Optional) Sets a hexadecimal value for data pattern.

The range is 0 to FFFFFFFF.

Step 6 **frequency** *seconds*

Example:

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

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

Step 7 **end**

Example:

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

Returns to privileged EXEC mode.

What to do next

To add proactive threshold conditions and reactive triggering for generating traps, or for starting another operation, to an IP SLAs operation, see the "Configuring Proactive Threshold Monitoring" section.

Configure a UDP echo operation with optional parameters on the source device

Perform this task to configure a UDP echo operation with optional parameters on the source device.

Before you begin

If you are using an IP SLAs Responder in this operation, the responder must be configured on the destination device. See the "Configuring the IP SLAs Responder on the Destination 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 **udp-echo** {*destination-ip-addres* | *destination-hostname*} *destination-port* [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**control** {**enable** | **disable**}]

Example:

```
Device(config-ip-sla)# udp-echo 172.29.139.134 5000
```

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

Use the **control disable** keyword combination only if you disable the IP SLAs control protocol on both the source and target devices

- *destination-ip-address* | *destination-hostname*: Specifies the IP address or hostname of the target device for the UDP Jitter operation.
- *destination-port*: The UDP port number on the target device that will receive the packets.
- **source-ip** {*ip-address* | *hostname*}: (Optional) Specifies the source IP address or hostname from which packets will be sent.
- **source-port** *port-number*: (Optional) Specifies the UDP source port number for the test packets.
- **control** {**enable** | **disable**}: (Optional) Enables or disables the control protocol, which is used to notify the responder on the target device about the test.

  Use the **control disable** keyword combination only if you disable the IP SLAs control protocol on both source and destination devices.

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

Example:

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

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

Step 6 **data-pattern** *hex-pattern*

Example:

```
Device(config-ip-sla-udp)# data-pattern
```

(Optional) Specifies the data pattern in an IP SLAs operation to test for data corruption.

Step 7 **history distributions-of-statistics-kept** *size*

Example:

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

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

size: The range is from 1 to 20.

Step 8 **history-enhanced** [**interval** *seconds*] [**buckets** *number-of-buckets*]

Example:

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

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

- **interval** *seconds*: (Optional) The interval, in seconds, at which to collect and store enhanced statistics. The range is from 1 to 3600 seconds.
- **buckets** *number-of-buckets*: (Optional) The number of enhanced history buckets to retain. The range is from 1 to 100.

Step 9 **history filter** {**none** | **all** | **overThreshold** | **failures**}

Example:

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

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

Step 10 **frequency** *seconds*

Example:

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

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

Step 11 **history hours-of-statistics-kept** *hours*

Example:

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

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

Step 12 **history lives-kept** *lives*

Example:

```
Device(config-ip-sla-udp)# history lives-kept 2
```

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

Step 13 **owner** *owner-id*

Example:

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

(Optional) Configures the SNMP owner of an IP SLAs operation.

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

Example:

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

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

Step 15 **history statistics-distribution-interval** *milliseconds*

Example:

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

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

Step 16 **tag** *text*

Example:

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

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

Step 17 **threshold** *miiliseconds*

Example:

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

(Optional) Sets the upper threshold value for calculating network monitoring statistics created by an IP SLAs operation.

Step 18 **timeout** *miiliseconds*

Example:

```
Device(config-ip-sla-udp)# timeout 10000
```

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

Step 19 Configure one of the following:

- **tos** *number*
- **traffic-class** *number*

Example:

```
Device(config-ip-sla-udp)# tos 160
OR
Device(config-ip-sla-udp)# traffic-class 160
```

Optional) Defines the type of byte in the IPv4 header of an IP SLAs operation.

- **tos** *number*: Defines the ToS byte in the IPv4 header of an IP SLAs operation.
- **traffic-class** *number*: Defines the traffic class byte in the IPv6 header for a supported IP SLAs operation.

Step 20 **flow-label** *number*

Example:

```
Device(config-ip-sla-udp)# flow-label 112233
```

(Optional) In an IPv6 network only, defines the flow label field in the IPv6 header for a supported IP SLAs operation.

Step 21 **verify-data**

Example:

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

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

Step 22 **exit**

Example:

```
Device(config-ip-sla-udp)# exit
```

Exits UDP configuration submode and returns to global configuration mode.

What to do next

To add proactive threshold conditions and reactive triggering for generating traps, or for starting another operation, to an IP SLAs operation, see the "Configuring Proactive Threshold Monitoring" section.

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 example for IP SLAs UDP echo operations

The following example configures an IP SLAs operation type of UDP echo that will start immediately and run indefinitely.

```
Device> enable
Device# configure terminal
Device(config)# ip sla 5
Device(config-ip-sla)# udp-echo 172.29.139.134 5000
Device(config-ip-sla-udp)# frequency 30
Device(config-ip-sla-udp)# request-data-size 160
Device(config-ip-sla-udp)# tos 128
Device(config-ip-sla-udp)# timeout 1000
Device(config-ip-sla-udp)# tag FLL-RO
Device(config-ip-sla-udp)# ip sla schedule 5 life forever start-time now
```