IP SLAs TCP Connect Operation

Feature History for IP SLAs - TCP Connect 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 17.18.1	IP SLAs - TCP Connect Operation: This operation measures the response time needed to establish a TCP connection between a Cisco device and a target device across an IP network.	Cisco C9350 Series Smart Switches Cisco C9610 Series Smart Switches

IP SLA TCP connect

The IP SLAs TCP Connect operation is used to measure the response time needed to establish a TCP connection between a Cisco device and a target device across an IP network. By utilizing TCP, a Layer 4 protocol known for providing reliable and full-duplex communication, this operation offers valuable insights into the performance and availability of network services. The target device can be any IP-enabled system, such as a server or a network appliance, or it can be configured as an IP SLAs Responder to enable additional features and more precise measurements. This capability enables network administrators to effectively monitor, analyze, and troubleshoot network performance by testing connectivity to various services and applications throughout the network.

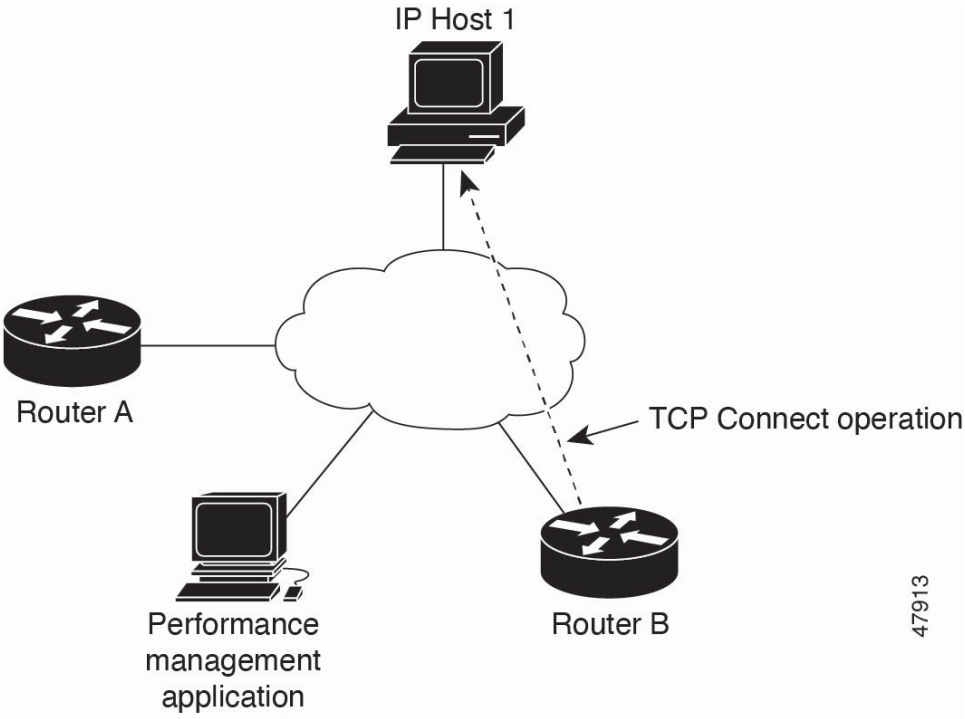
How IP SLA TCP works

Summary

In the figure below Device B is configured as the source IP SLAs device and a TCP Connect operation is configured with the destination device as IP Host 1.

Workflow

Figure 1: TCP Connect Operation



Connection response time is computed by measuring the time taken between sending a TCP request message from Device B to IP Host 1 and receiving a reply from IP Host 1.

IP SLAs TCP connect and IP SLAs responder

The accuracy of TCP Connect measurements is enhanced when the IP SLAs Responder is enabled on the destination Cisco device. When targeting another Cisco device, IP SLAs can initiate a TCP connection to any specified port, allowing for flexible and precise testing. However, if the destination is not a Cisco IP host, you need to specify a well-known port number corresponding to the intended service, such as port 21 for FTP, port 23 for Telnet, or port 80 for an HTTP server. This ensures that the operation can successfully establish a TCP connection and accurately measure network response times.

The use of the IP SLAs Responder is optional for TCP Connect operations when the target is a Cisco device, but it is not supported on non-Cisco devices. TCP Connect is typically used to test the availability of virtual circuits or applications by simulating connections to services like Telnet, SQL, and others. This approach allows network administrators to assess the performance and responsiveness of servers and applications, helping to verify and maintain agreed-upon IP service levels within the network.

Configure and scheduling a TCP connect operation on the source device

You can either configure a basic TCP connect operation or a TCP connect operation with optional parameters on a source device.

Perform only one of the following tasks:

Configure a basic TCP connect operation on the source device

Perform this procedure to configure a basic TCP connect 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 **tcp-connect** {*destination-ip-addres* | *destination-hostname*} *destination-port* [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**control** {**enable** | **disable**}]

Example:

```
Device(config-ip-sla)# tcp-connect 172.29.139.134 5000
```

Defines a TCP Connect operation and enters IP SLA TCP 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 **frequency** *seconds*

Example:

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

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

Step 6 **end**

Example:

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

Returns to privileged EXEC mode.

Configure a TCP connect operation with optional parameters on the source device

Perform this task to configure TCP connect 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 **tcp-connect** {*destination-ip-addres* | *destination-hostname*} *destination-port* [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**control** {**enable** | **disable**}]

Example:

```
Device(config-ip-sla)# tcp-connect 172.29.139.134 5000
```

Defines a TCP Connect operation and enters IP SLA TCP 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-tcp)# 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-tcp)# 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 7 **history enhanced** [**interval** *seconds*] [**buckets** *number-of-buckets*]

Example:

```
Device(config-ip-sla-tcp)# 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 8 **history filter** {**none** | **all** | **overThreshold** | **failures**}

Example:

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

(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-tcp)# owner admin
```

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

Step 13 **history lives-kept** *lives*

Example:

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

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

Step 14 **owner** *owner-id*

Example:

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

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

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

Example:

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

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

Step 17 **threshold** *miiliseconds*

Example:

```
Device(config-ip-sla-tcp)# 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-tcp)# 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-tcp)# tos 160
OR
Device(config-ip-sla-tcp)# 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-tcp)# 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 **exit**

Example:

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

Exits UDP configuration submode and returns to global configuration mode.

Step 22 **show ip sla configuration** [*operation-number*]

Example:

```
Device# show ip sla configuration 10
```

(Optional) Displays configuration values including all defaults for all IP SLAs operations or a specified operation.

Configuration examples for IP SLAs TCP connect operations

The following example shows how to configure a TCP Connect operation from Device B to the Telnet port (TCP port 23) of IP Host 1 (IP address 10.0.0.1), as shown in the "TCP Connect Operation" figure in the "Information About the IP SLAs TCP Connect Operation" section. The operation is scheduled to start immediately. In this example, the control protocol is disabled on the source (Device B). IP SLAs uses the control protocol to notify the IP SLAs responder to enable the target port temporarily. This action allows the responder to reply to the TCP Connect operation. In this example, because the target is not a Cisco device and a well-known TCP port is used, there is no need to send the control message.

Device A (target device) Configuration

```
Device> enable
Device# configure terminal
Device(config)# ip sla responder tcp-connect ipaddress 10.0.0.1 port 23
```

Device B (source device) Configuration

```
Device> enable
Device# configure terminal
Device(config)# ip sla 9
Device(config-ip-sla)# tcp-connect 10.0.0.1 23 control disable
Device(config-ip-sla-tcp)# frequency 30
Device(config-ip-sla-tcp)# tos 128
Device(config-ip-sla-tcp)# timeout 1000
Device(config-ip-sla-tcp)# tag FLL-RO
Device(config-ip-sla-tcp)# ip sla schedule 9 start-time now
```

The following example shows how to configure a TCP Connect operation with a specific port, port 23, and without an IP SLAs responder. The operation is scheduled to start immediately and run indefinitely.

```
Device> enable
Device# configure terminal
Device(config)# ip sla 9
Device(config-ip-sla)# tcp-connect 173.29.139.132 21 control disable
Device(config-ip-sla-tcp)# frequency 30
Device(config-ip-sla-tcp)# ip sla schedule 9 life forever start-time now
```