



## Configuring IP SLAs FTP Operations

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This module describes how to configure an IP Service Level Agreements (SLAs) File Transfer Protocol (FTP) operation to measure the response time between a Cisco device and an FTP server to retrieve a file. The IP SLAs FTP operation supports an FTP GET request only. This module also demonstrates how the results of the FTP operation can be displayed and analyzed to determine the capacity of your network. The FTP operation can be used also for troubleshooting FTP server performance.

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### Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

### Restrictions for IP SLAs FTP Operations

The IP SLAs FTP operation only supports FTP GET (download) requests.

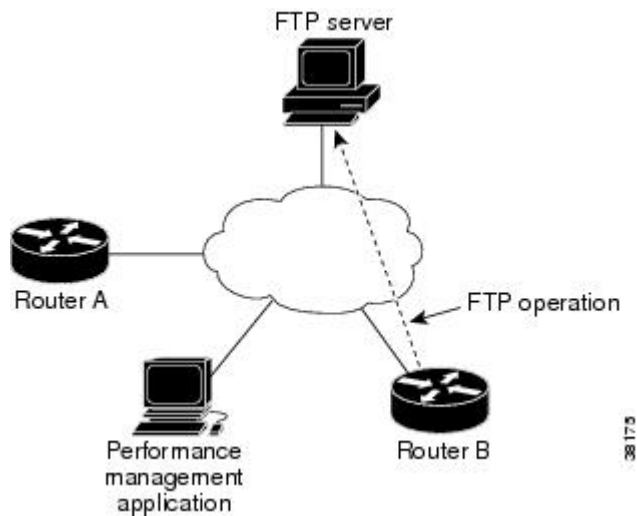
# Information About IP SLAs FTP Operations

## FTP Operation

The FTP operation measures the round-trip time (RTT) between a Cisco device and an FTP server to retrieve a file. FTP is an application protocol, part of the Transmission Control Protocol (TCP)/IP protocol stack, used for transferring files between network nodes.

In the figure below Device B is configured as the source IP SLAs device and an FTP operation is configured with the FTP server as the destination device.

**Figure 1: FTP Operation**



Connection response time is computed by measuring the time taken to download a file to Device B from the remote FTP server using FTP over TCP. This operation does not use the IP SLAs Responder.



**Note**

To test the response time to connect to an FTP port (Port 21), use the IP SLAs TCP Connect operation.

Both active and passive FTP transfer modes are supported. The passive mode is enabled by default. Only the FTP GET (download) operation type is supported. The URL specified for the FTP GET operation must be in one of the following formats:

- ftp://username:password@host/filename
- ftp://host/filename

If the username and password are not specified, the defaults are anonymous and test, respectively.

FTP carries a significant amount of data traffic and can affect the performance of your network. The results of an IP SLAs FTP operation to retrieve a large file can be used to determine the capacity of the network but retrieve large files with caution because the FTP operation will consume more bandwidth. The FTP operation also measures your FTP server performance levels by determining the RTT taken to retrieve a file.

# How to Configure IP SLAs FTP Operations

## Configuring an FTP Operation on a Source Device



**Note** There is no need to configure an IP SLAs responder on the destination device.

Perform one of the following tasks:

### Configuring a Basic FTP Operation on the Source Device

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla** *operation-number*
4. **ftp get url** [**source-ip** {*ip-address* | *hostname*}] [**mode** {**passive** | **active**}
5. **frequency** *seconds*
6. **end**

#### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ip sla</b> <i>operation-number</i>  <b>Example:</b> Device(config)# ip sla 10	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.

	Command or Action	Purpose
<b>Step 4</b>	<b>ftp get</b> <i>url</i> [ <b>source-ip</b> { <i>ip-address</i>   <i>hostname</i> }] [ <b>mode</b> { <b>passive</b>   <b>active</b> }]  <b>Example:</b>  <pre>Device(config-ip-sla)# ftp get ftp://username:password@hostip/test.cap</pre>	Defines an FTP operation and enters IP SLA FTP configuration mode.
<b>Step 5</b>	<b>frequency</b> <i>seconds</i>  <b>Example:</b>  <pre>Device(config-ip-sla-ftp)# frequency 30</pre>	(Optional) Sets the rate at which a specified IP SLAs operation repeats.
<b>Step 6</b>	<b>end</b>  <b>Example:</b>  <pre>Device(config-ip-sla-ftp)# exit</pre>	Exits to privileged EXEC mode.

## Configuring an FTP Operation with Optional Parameters on the Source Device

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla** *operation-number*
4. **ftp get** *url* [**source-ip** {*ip-address* | *hostname*}] [**mode** {**passive** | **active**}]
5. **history buckets-kept** *size*
6. **history distributions-of-statistics-kept** *size*
7. **history enhanced** [**interval** *seconds*] [**buckets** *number-of-buckets*]
8. **history filter** {**none** | **all** | **overThreshold** | **failures**}
9. **frequency** *seconds*
10. **history hours-of-statistics-kept** *hours*
11. **history lives-kept** *lives*
12. **owner** *owner-id*
13. **history statistics-distribution-interval** *milliseconds*
14. **tag** *text*
15. **threshold** *milliseconds*
16. **timeout** *milliseconds*
17. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>ip sla <i>operation-number</i></b>  <b>Example:</b> Device(config)# ip sla 10	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.
Step 4	<b>ftp get <i>url</i> [source-ip {<i>ip-address</i>   <i>hostname</i>}] [mode {passive   active}]</b>  <b>Example:</b> Device(config-ip-sla)# ftp get ftp://username:password@hostip/filename	Defines an FTP operation and enters IP SLA FTP configuration mode.
Step 5	<b>history buckets-kept <i>size</i></b>  <b>Example:</b> Device(config-ip-sla-ftp)# history buckets-kept 25	(Optional) Sets the number of history buckets that are kept during the lifetime of an IP SLAs operation.
Step 6	<b>history distributions-of-statistics-kept <i>size</i></b>  <b>Example:</b> Device(config-ip-sla-ftp)# history distributions-of-statistics-kept 5	(Optional) Sets the number of statistics distributions kept per hop during an IP SLAs operation.
Step 7	<b>history enhanced [interval <i>seconds</i>] [buckets <i>number-of-buckets</i>]</b>  <b>Example:</b> Device(config-ip-sla-ftp)# history enhanced interval 900 buckets 100	(Optional) Enables enhanced history gathering for an IP SLAs operation.

	Command or Action	Purpose
<b>Step 8</b>	<b>history filter</b> {none   all   overThreshold   failures}  <b>Example:</b> Device(config-ip-sla-ftp)# history filter failures	(Optional) Defines the type of information kept in the history table for an IP SLAs operation.
<b>Step 9</b>	<b>frequency</b> seconds  <b>Example:</b> Device(config-ip-sla-ftp)# frequency 30	(Optional) Sets the rate at which a specified IP SLAs operation repeats.
<b>Step 10</b>	<b>history hours-of-statistics-kept</b> hours  <b>Example:</b> Device(config-ip-sla-ftp)# history hours-of-statistics-kept 4	(Optional) Sets the number of hours for which statistics are maintained for an IP SLAs operation.
<b>Step 11</b>	<b>history lives-kept</b> lives  <b>Example:</b> Device(config-ip-sla-ftp)# history lives-kept 5	(Optional) Sets the number of lives maintained in the history table for an IP SLAs operation.
<b>Step 12</b>	<b>owner</b> owner-id  <b>Example:</b> Device(config-ip-sla-ftp)# owner admin	(Optional) Configures the Simple Network Management Protocol (SNMP) owner of an IP SLAs operation.
<b>Step 13</b>	<b>history statistics-distribution-interval</b> milliseconds  <b>Example:</b> Device(config-ip-sla-ftp)# history statistics-distribution-interval 10	(Optional) Sets the time interval for each statistics distribution kept for an IP SLAs operation.
<b>Step 14</b>	<b>tag</b> text  <b>Example:</b> Device(config-ip-sla-ftp)# tag TelnetPollServer1	(Optional) Creates a user-specified identifier for an IP SLAs operation.
<b>Step 15</b>	<b>threshold</b> milliseconds  <b>Example:</b> Device(config-ip-sla-ftp)# threshold 10000	(Optional) Sets the upper threshold value for calculating network monitoring statistics created by an IP SLAs operation.

	Command or Action	Purpose
<b>Step 16</b>	<b>timeout</b> <i>milliseconds</i>  <b>Example:</b> Device(config-ip-sla-ftp)# timeout 10000	(Optional) Sets the amount of time an IP SLAs operation waits for a response from its request packet.
<b>Step 17</b>	<b>end</b>  <b>Example:</b> Device(config-ip-sla-ftp)# end	Exits to privileged EXEC mode.

## Scheduling IP SLAs Operations

### Before You Begin

- All IP Service Level Agreements (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 (,).

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. Enter one of the following commands:
  - **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**]
  - **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*]}]
4. **end**
5. **show ip sla group schedule**
6. **show ip sla configuration**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><b>enable</b></p> <p><b>Example:</b></p> <pre>Device&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Device# configure terminal</pre>	<p>Enters global configuration mode.</p>
Step 3	<p>Enter one of the following commands:</p> <ul style="list-style-type: none"> <li>• <b>ip sla schedule</b> <i>operation-number</i> [<b>life</b> {<b>forever</b>   <i>seconds</i>}] [<b>start-time</b> {[<i>hh:mm:ss</i>] [<i>month day</i>   <i>day month</i>]   <b>pending</b>   <b>now</b>   <b>after</b> <i>hh:mm:ss</i>}] [<b>ageout</b> <i>seconds</i>] [<b>recurring</b>]</li> <li>• <b>ip sla group schedule</b> <i>group-operation-number</i> <i>operation-id-numbers</i> {<b>schedule-period</b> <i>schedule-period-range</i>   <b>schedule-together</b>} [<b>ageout</b> <i>seconds</i>] [<b>frequency</b> <i>group-operation-frequency</i>] [<b>life</b> {<b>forever</b>   <i>seconds</i>}] [<b>start-time</b> {<i>hh:mm</i> [:<i>ss</i>] [<i>month day</i>   <i>day month</i>]   <b>pending</b>   <b>now</b>   <b>after</b> <i>hh:mm</i> [:<i>ss</i>]}]</li> </ul> <p><b>Example:</b></p> <pre>Device(config)# ip sla schedule 10 life forever start-time now</pre> <pre>Device(config)# ip sla group schedule 10 schedule-period frequency</pre> <pre>Device(config)# ip sla group schedule 1 3,4,6-9 life forever start-time now</pre> <pre>Device(config)# ip sla schedule 1 3,4,6-9 schedule-period 50 frequency range 80-100</pre>	<ul style="list-style-type: none"> <li>• Configures the scheduling parameters for an individual IP SLAs operation.</li> <li>• Specifies an IP SLAs operation group number and the range of operation numbers for a multioperation scheduler.</li> </ul>
Step 4	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config)# end</pre>	<p>Exits global configuration mode and returns to privileged EXEC mode.</p>
Step 5	<p><b>show ip sla group schedule</b></p> <p><b>Example:</b></p> <pre>Device# show ip sla group schedule</pre>	<p>(Optional) Displays IP SLAs group schedule details.</p>



	Command or Action	Purpose
Step 6	<b>show ip sla configuration</b>  <b>Example:</b> Device# show ip sla configuration	(Optional) Displays IP SLAs configuration details.

## Troubleshooting Tips

- If the IP Service Level Agreements (SLAs) operation is not running and not generating statistics, add the **verify-data** command to the configuration (while configuring in IP SLA configuration mode) to enable data verification. When data verification is enabled, each operation response is checked for corruption. Use the **verify-data** command with caution during normal operations because it generates unnecessary overhead.
- Use the **debug ip sla trace** and **debug ip sla error** commands to help troubleshoot issues with an IP SLAs operation.

## What to Do Next

To add proactive threshold conditions and reactive triggering for generating traps (or for starting another operation) to an IP Service Level Agreements (SLAs) operation, see the “Configuring Proactive Threshold Monitoring” section.

# Configuration Examples for IP SLAs FTP Operations

## Example: Configuring an FTP Operation

The following example shows how to configure an FTP operation from Device B to the FTP server as shown in the "FTP Operation" figure in the "Information About IP SLAs FTP Operation" section. The operation is scheduled to start every day at 1:30 a.m. In this example, the file named test.cap is to be retrieved from the host, cisco.com, with a password of abc using FTP in active mode.

### Device B Configuration

```
ip sla 10
  ftp get ftp://user1:abc@test.cisco.com/test.cap mode active
  frequency 20
  tos 128
  timeout 40000
  tag FLL-FTP
ip sla schedule 10 start-time 01:30:00 recurring
```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
Cisco IOS IP SLAs commands	<a href="#">Cisco IOS IP SLAs Command Reference</a>

### MIBs

MIBs	MIBs Link
CISCO-RTTMON-MIB	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:  <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### 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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for IP SLAs - FTP Operation

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 [http://www.cisco.com/go/featurenavigator](#). An account on Cisco.com is not required.

**Table 1: Feature Information for the IP SLAs - FTP Operation**

Feature Name	Releases	Feature Information
IP SLAs - FTP Operation	Cisco IOS XE Release 3.2SE	<p>The IP SLAs File Transfer Protocol (FTP) operation allows you to measure the network response time between a Cisco device and an FTP server to retrieve a file.</p> <p>In Cisco IOS XE Release 3.2SE, this feature was supported on the following platforms:</p> <ul style="list-style-type: none"><li>• Catalyst 3650 Series Switches</li><li>• Catalyst 3850 Series Switches</li><li>• Cisco 5760 Wireless LAN Controller</li></ul>

