Configuring IP SLAs HTTP Operations

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This module describes how to configure an IP Service Level Agreements (SLAs) HTTP operation to monitor the response time between a Cisco device and an HTTP server to retrieve a web page. The IP SLAs HTTP operation supports both the normal GET requests and customer RAW requests. This module also demonstrates how the results of the HTTP operation can be displayed and analyzed to determine how an HTTP server is performing.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see 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 at the end of this document.

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. An account on Cisco.com is not required.

Restrictions for IP SLAs HTTP Operations

- IP SLAs HTTP operations support only HTTP/1.0.
- HTTP/1.1 is not supported for any IP SLAs HTTP operation, including HTTP RAW requests.

Information About IP SLAs HTTP Operations

HTTP Operation

The HTTP operation measures the round-trip time (RTT) between a Cisco device and an HTTP server to retrieve a web page. The HTTP server response time measurements consist of three types:

- DNS lookup--RTT taken to perform domain name lookup.
- TCP Connect--RTT taken to perform a TCP connection to the HTTP server.
- HTTP transaction time--RTT taken to send a request and get a response from the HTTP server. The operation retrieves only the home HTML page.

The DNS operation is performed first and the DNS RTT is measured. Once the domain name is found, a TCP Connect operation to the appropriate HTTP server is performed and the RTT for this operation is measured. The final operation is an HTTP request and the RTT to retrieve the home HTML page from the HTTP server is measured. One other measurement is made and called the time to first byte which measures the time from the start of the TCP Connect operation to the first HTML byte retrieved by the HTTP operation. The total HTTP RTT is a sum of the DNS RTT, the TCP Connect RTT, and the HTTP RTT.

For GET requests, IP SLAs will format the request based on the specified URL. For RAW requests, IP SLAs requires the entire content of the HTTP request. When a RAW request is configured, the raw commands are specified in HTTP RAW configuration mode. A RAW request is flexible and allows you to control fields such as authentication. An HTTP request can be made through a proxy server.

The results of an HTTP operation can be useful in monitoring your web server performance levels by determining the RTT taken to retrieve a web page.

How to Configure IP SLAs HTTP Operations

Configuring an HTTP GET Operation on the Source Device

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

Perform only one of the following tasks:

Configuring a Basic HTTP GET Operation on the Source Device

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla** *operation-number*
4. **http** {**get** | **raw**} *url* [**name-server** *ip-address*] [**version** *version-number*] [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**cache** {**enable** | **disable**}] [**proxy** *proxy-url*]
5. **frequency** *seconds*
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**ip sla** *operation-number* **Example:** `Router(config)# ip sla 10`	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.
Step 4	**http** {**get**	**raw**} *url* [**name-server** *ip-address*] [**version** *version-number*] [**source-ip** {*ip-address*	*hostname*}] [**source-port** *port-number*] [**cache** {**enable**	**disable**}] [**proxy** *proxy-url*] **Example:** `Router(config-ip-sla)# http get http://198.133.219.25`	Defines an HTTP operation and enters IP SLA configuration mode.
Step 5	**frequency** *seconds* **Example:** `Router(config-ip-sla-http)# frequency 90`	(Optional) Sets the rate at which a specified IP SLAs HTTP operation repeats. The default and minimum frequency value for an IP SLAs HTTP operation is 60 seconds.

Command or Action	Purpose
Step 6 **end** **Example:** `Router(config-ip-sla-http)# end`	Exits to privileged EXEC mode.

Configuring an HTTP GET Operation with Optional Parameters on the Source Device

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla** *operation-number*
4. **http** {**get** | **raw**} *url* [**name-server** *ip-address*] [**version** *version-number*] [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**cache** {**enable** | **disable**}] [**proxy** *proxy-url*]
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. **http-raw-request**
12. **history lives-kept** *lives*
13. **owner** *owner-id*
14. **history statistics-distribution-interval** *milliseconds*
15. **tag** *text*
16. **threshold** *milliseconds*
17. **timeout** *milliseconds*
18. **tos** *number*
19. **end**

DETAILED STEPS

Command or Action	Purpose
Step 1 **enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**ip sla** *operation-number* **Example:** Router(config)# ip sla 10	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.
Step 4	**http** {**get** | **raw**} *url* [**name-server** *ip-address*] [**version** *version-number*] [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**cache** {**enable** | **disable**}] [**proxy** *proxy-url*] **Example:** Router(config-ip-sla)# http get http://198.133.219.25	Defines an HTTP operation and enters IP SLA configuration mode.
Step 5	**history buckets-kept** *size* **Example:** Router(config-ip-sla-http)# 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:** Router(config-ip-sla-http)# 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:** Router(config-ip-sla-http)# history enhanced interval 900 buckets 100	(Optional) Enables enhanced history gathering for an IP SLAs operation.

	Command or Action	Purpose
Step 8	**history filter** {**none** | **all** | **overThreshold** | **failures**} **Example:** `Router(config-ip-sla-http)# history filter failures`	(Optional) Defines the type of information kept in the history table for an IP SLAs operation.
Step 9	**frequency** *seconds* **Example:** `Router(config-ip-sla-http)# frequency 90`	(Optional) Sets the rate at which a specified IP SLAs HTTP operation repeats. The default and minimum frequency value for an IP SLAs HTTP operation is 60 seconds.
Step 10	**history hours-of-statistics-kept** *hours* **Example:** `Router(config-ip-sla-http)# history hours-of-statistics-kept 4`	(Optional) Sets the number of hours for which statistics are maintained for an IP SLAs operation.
Step 11	**http-raw-request** **Example:** `Router(config-ip-sla-http)# http-raw-request`	(Optional) Explicitly specifies the options for a GET request for an IP SLAs HTTP operation.
Step 12	**history lives-kept** *lives* **Example:** `Router(config-ip-sla-http)# history lives-kept 5`	(Optional) Sets the number of lives maintained in the history table for an IP SLAs operation.
Step 13	**owner** *owner-id* **Example:** `Router(config-ip-sla-http)# owner admin`	(Optional) Configures the Simple Network Management Protocol (SNMP) owner of an IP SLAs operation.
Step 14	**history statistics-distribution-interval** *milliseconds* **Example:** `Router(config-ip-sla-http)# history statistics-distribution-interval 10`	(Optional) Sets the time interval for each statistics distribution kept for an IP SLAs operation.

	Command or Action	Purpose
Step 15	**tag** *text*	(Optional) Creates a user-specified identifier for an IP SLAs operation.
	Example:	
	Router(config-ip-sla-http)# tag TelnetPollServer1	
Step 16	**threshold** *milliseconds*	(Optional) Sets the upper threshold value for calculating network monitoring statistics created by an IP SLAs operation.
	Example:	
	Router(config-ip-sla-http)# threshold 10000	
Step 17	**timeout** *milliseconds*	(Optional) Sets the amount of time an IP SLAs operation waits for a response from its request packet.
	Example:	
	Router(config-ip-sla-http)# timeout 10000	
Step 18	**tos** *number*	(Optional) Defines a type of service (ToS) byte in the IP header of an IP SLAs operation.
	Example:	
	Router(config-ip-sla-http)# tos 160	
Step 19	**end**	Exits to privileged EXEC mode.
	Example:	
	Router(config-ip-sla-http)# end	

Configuring an HTTP RAW Operation on the Source Device

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

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla** *operation-number*
4. **http** {**get** | **raw**} *url* [**name-server** *ip-address*] [**version** *version-number*] [**source-ip** {*ip-address* | *hostname*}] [**source-port** *port-number*] [**cache** {**enable** | **disable**}] [**proxy** *proxy-url*]
5. **http-raw-request**
6. Enter the required HTTP 1.0 command syntax.
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**ip sla** *operation-number* **Example:** Router(config)# ip sla 10	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.
Step 4	**http** {**get**	**raw**} *url* [**name-server** *ip-address*] [**version** *version-number*] [**source-ip** {*ip-address*	*hostname*}] [**source-port** *port-number*] [**cache** {**enable**	**disable**}] [**proxy** *proxy-url*] **Example:** Router(config-ip-sla)# http raw http://198.133.219.25	Defines an HTTP operation.
Step 5	**http-raw-request** **Example:** Router(config-ip-sla)# http-raw-request	Enters HTTP RAW configuration mode.

Command or Action	Purpose
Step 6 Enter the required HTTP 1.0 command syntax.	Specifies all the required HTTP 1.0 commands.
Example:	
Router(config-ip-sla-http)# GET /en/US/hmpgs/index.html HTTP/ 1.0\r\n\r\n	
Step 7 **end**	Exits to privileged EXEC mode.
Example:	
Router(config-ip-sla-http)# end	

Scheduling IP SLAs Operations

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Note
- 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.
- List of one or more operation ID numbers to be added to a multioperation group is limited to a maximum of 125 characters, including commas (,).

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. Do one of the following:

   - **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* [**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. **exit**
5. **show ip sla group schedule**
6. **show ip sla configuration**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.
		• Enter your password if prompted.
	Example:	
	Router> enable	
Step 2	**configure terminal**	Enters global configuration mode.
	Example:	
	Router# configure terminal	
Step 3	Do one of the following:	For individual IP SLAs operations only:
	• **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**]	Configures the scheduling parameters for an individual IP SLAs operation.
		or
	• **ip sla group schedule** *group-operation-number operation-id-numbers* **schedule-period** *schedule-period-range* [**ageout** *seconds*] [**frequency** *group-operation-frequency*] [**life**{**forever**	*seconds*}] [**start-time**{*hh:mm*[*:ss*] [*month day*	*day month*]	**pending**	**now**	**after** *hh:mm:ss*}]	For multioperation scheduler only:
		Specifies an IP SLAs operation group number and the range of operation numbers to be scheduled in global configuration mode.
	Example:	
	Router(config)# ip sla schedule 10 start-time now life forever	
	Example:	
	Router(config)# ip sla group schedule 1 3,4,6-9	
Step 4	**exit**	Exits to privileged EXEC mode.
	Example:	
	Router(config)# exit	
Step 5	**show ip sla group schedule**	(Optional) Displays the IP SLAs group schedule details.
	Example:	
	Router# show ip sla group schedule	

	Command or Action	Purpose
Step 6	**show ip sla configuration** **Example:** `Router# show ip sla configuration`	(Optional) Displays the IP SLAs configuration details.

Troubleshooting Tips

- If the IP SLAs operation is not running and generating statistics, add the **verify-data** command to the configuration of the operation (while configuring in IP SLA configuration mode) to enable data verification. When 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 **debugipsla 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 SLAs operation, see the "Configuring Proactive Threshold Monitoring" section.

To view and interpret the results of an IP SLAs operation use the **show ip sla statistics** command. Checking the output for fields that correspond to criteria in your service level agreement will help you determine whether the service metrics are acceptable.

Configuration Examples for IP SLAs HTTP Operations

Example Configuring an HTTP GET Operation

The following example show how to create and configure operation number 8 as an HTTP GET operation. The destination URL IP address represents the www.cisco.com website. The following figure depicts the HTTP GET operation.

Figure 1

HTTP server

Router A

HTTP operation

Performance management application

Router B

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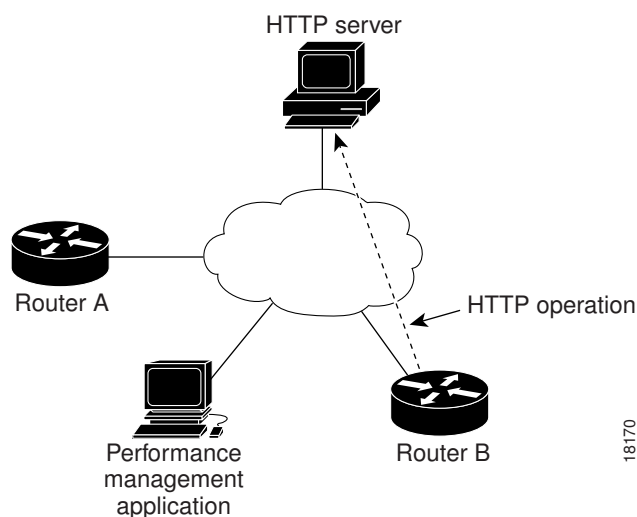
Router B Configuration

```
ip sla 8
 http get url http://198.133.219.25
!
ip sla schedule 8 start-time now
```

Example Configuring an HTTP RAW Operation

The following example shows how to configure an HTTP RAW operation. To use the RAW commands, enter HTTP RAW configuration mode by using the **http-raw-request** command in IP SLA configuration mode. The IP SLA HTTP RAW configuration mode is indicated by the (config-ip-sla-http) router prompt.

```
ip sla 8
 http raw url http://198.133.219.25
 http-raw-request
 GET /en/US/hmpgs/index.html HTTP/1.0\r\n
 \r\n
 end
ip sla schedule 8 life forever start-time now
```

Example Configuring an HTTP RAW Operation Through a Proxy Server

The following example shows how to configure an HTTP RAW operation through a proxy server. The proxy server is www.proxy.cisco.com and the HTTP server is www.yahoo.com.

```
ip sla 8
 http raw url http://www.proxy.cisco.com
 http-raw-request
```

```
 GET http://www.yahoo.com HTTP/1.0\r\n
 \r\n
 end
ip sla schedule 8 life forever start-time now
```

Example Configuring an HTTP RAW Operation with Authentication

The following example shows how to configure an HTTP RAW operation with authentication.

```
ip sla 8
 http raw url http://site-test.cisco.com
 http-raw-request
 GET /lab/index.html HTTP/1.0\r\n
 Authorization: Basic btNpdGT4biNvoZe=\r\n
 \r\n
 end
ip sla schedule 8 life forever start-time now
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Cisco IOS IP SLAs commands	*Cisco IOS IP SLAs Command Reference*
Cisco IOS IP SLAs: general information	Cisco IOS IP SLAs Overview chapter of the *Cisco IOS IP SLAs Configuration Guide*.

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

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: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

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.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IP SLAs HTTP Operations

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 www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1   Feature Information for IP SLAs HTTP Operations

Feature Name	Releases	Feature Information
IP SLAs HTTP Operation	12.2(31)SB2 12.2(33)SRB1 12.2(33)SXH 12.3(14)T 15.0(1)S Cisco IOS XE 3.1.0SG	The Cisco IOS IP SLAs Hypertext Transfer Protocol (HTTP) operation allows you to measure the network response time between a Cisco device and an HTTP server to retrieve a web page.